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CATALOG 2020

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Promega 2020 Life Science Catalog

ABOUT THE COVER

The cover image Illustrates the power and simplicity of bioluminescence for monitoring biological events in real time. This artist's rendition shows the luminescent signal generated upon annexin V binding to phosphatidylserine on the cell surface during early apoptosis. This is the basis of the Promega RealTime-Glo™ Annexin V Apoptosis Assay.

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Food, Plant, Water and Cosmetic Testing

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Available in the Helix® on-site stocking system

Food Testing

Maxwell® RSC PureFood Pathogen Kit

Product	Size	Cat.#
Maxwell® RSC PureFood Pathogen Kit	48 preps	AS1660

Not For Medical Diagnostic Use.

Description: If you need to make quick decisions about potential food spoilage and contamination, the Maxwell® RSC PureFood Pathogen Kit offers a simple extraction protocol to obtain high-quality bacterial DNA from a variety of food sample types. The kit works with inhibiting sample types, and can lyse both Gram$^+$ or Gram$^-$ bacteria, eliminating laborious sample preparation steps like enzymatic pretreatment.

The extracted DNA is ready for advanced downstream molecular analyses including NGS, serotyping, and identification of spoilage organisms. The high-performance Maxwell® chemistries coupled with the trusted benchtop Maxwell® RSC instrument allow you to purify bacterial DNA from food samples in as little as 40 minutes, giving you the ability to get answers more quickly.

Features:

- Isolate DNA from raw or processed food samples
- Works well with inhibiting sample types
- No need for labor-intensive sample processing

Storage Conditions: Store at 15–30°C.

Maxwell® RSC Plant DNA Kit

Product	Size	Cat.#
Maxwell® RSC Plant DNA Kit	48 preps	AS1490

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Maxwell® RSC Plant DNA Kit is used with the Maxwell® RSC Instrument (Cat.# AS4500) to provide an easy method for efficient, automated purification of genomic DNA (gDNA) from plant tissue samples. The Maxwell® RSC Instrument is supplied with preprogrammed purification methods and is designed for use with predispensed reagent cartridges, maximizing simplicity and convenience. The instrument can process up to 16 samples in 45 minutes, and the purified DNA can be used directly in a variety of downstream applications, including PCR and agarose gel electrophoresis.

Features:

- **Extract Nucleic Acid from Corn, Soybean and *Arabidopsis* Tissue Samples:** The kit provides amplifiable nucleic acids compatible with downstream amplifications such as qPCR with minimal contaminants and enzyme inhibitors.
- **Experience Consistent Performance:** Less variability compared to traditional competing methods (CTAB and manual spin columns).
- **Achieve Walkaway Automation with Faster Results:** Free up laboratory resources to focus on higher value activities.
- **Perform Minimal Protocol Steps and No Organic Extractions:** Quickly purify up to 16 plant tissue samples in less than 60 minutes with minimal preprocessing.

Storage Conditions: Store at 15–30°C.

Maxwell® RSC PureFood GMO and Authentication Kit

Product	Size	Cat.#
Maxwell® RSC PureFood GMO and Authentication Kit	48 preps	AS1600
Available Separately	**Size**	**Cat.#**
CTAB Buffer	100 ml	MC1411

Not for Medical Diagnostic Use.

Description: The Maxwell® RSC PureFood GMO and Authentication Kit used with the Maxwell® RSC Instrument is designed to provide an easy and automated method for efficient purification of DNA used in PCR-based testing for Genetically Modified Organism (GMO) DNA sequences and PCR-based food and ingredient authentication.

The Maxwell® RSC Instrument is supplied with preprogrammed purification methods and is designed for use with the predispensed reagent cartridges, maximizing simplicity and convenience. The instrument can purify DNA from 1 to 16 raw and processed food samples including corn, soybeans, canola, ground pork, ground beef, pork gelatin, breaded fish, tortillas, corn chips and rice cakes in approximately 40 minutes.

Features:

- **Use an Optimized System:** Extract nucleic acid from a variety of food samples.
- **Rely on Consistent Performance:** Experience less variability compared to traditional competing methods.
- **Take Advantage of Walkaway Automation:** Achieve faster results. Free up laboratory resources to focus on higher value activities.
- **Work with an Easy-to-Use Kit:** Perform minimal protocol steps and no organic extractions. Quickly purify up to 16 food samples in less than 60 minutes with minimal preprocessing.

Storage Conditions: Store at 15–30°C.

Wizard® Magnetic DNA Purification System for Food

Product	Size	Cat.#
Wizard® Magnetic DNA Purification System for Food	200 preps	FF3750
	400 preps	FF3751
Available Separately		
Lysis Buffer A, Food	100 ml	A8191
Lysis Buffer B, Food	100 ml	Z3191
Precipitation Solution, Food	150 ml	Z3201

FF3750, FF3751 For in vitro use only. A8191, Z3191, Z3201 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Wizard® Magnetic DNA Purification System for Food is designed for purification of DNA from a variety of food samples, including corn seeds, cornmeal, soybeans, soy flour and soy milk. Processed food, such as corn chips, chocolate and chocolate-containing foods, lecithin and vegetable oils may also be used with the suggested protocol variations. The DNA purified from these samples can be used in PCR-based testing for genetically modified organism (GMO) DNA sequences.

Features:

- **Improved Productivity:** Obtain results in one-third the time of current methods.
- **Ease of Handling:** Requires minimal centrifugation and eliminates organic extractions.
- **Versatility and Robustness:** Validated with a broad variety of foodstuffs, including difficult samples such as lecithin and vegetable oils.

Storage Conditions: Store at 22–25°C.

Plant Testing

Maxwell® RSC Plant DNA Kit

Product	Size	Cat.#
Maxwell® RSC Plant DNA Kit	48 preps	AS1490

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Maxwell® RSC Plant DNA Kit is used with the Maxwell® RSC Instrument (Cat.# AS4500) to provide an easy method for efficient, automated purification of genomic DNA (gDNA) from plant tissue samples. The Maxwell® RSC Instrument is supplied with preprogrammed purification methods and is designed for use with predispensed reagent cartridges, maximizing simplicity and convenience. The instrument can process up to 16 samples in 45 minutes, and the purified DNA can be used directly in a variety of downstream applications, including PCR and agarose gel electrophoresis.

Features:

- **Extract Nucleic Acid from Corn, Soybean and *Arabidopsis* Tissue Samples:** The kit provides amplifiable nucleic acids compatible with downstream amplifications such as qPCR with minimal contaminants and enzyme inhibitors.
- **Experience Consistent Performance:** Less variability compared to traditional competing methods (CTAB and manual spin columns).
- **Achieve Walkaway Automation with Faster Results:** Free up laboratory resources to focus on higher value activities.
- **Perform Minimal Protocol Steps and No Organic Extractions:** Quickly purify up to 16 plant tissue samples in less than 60 minutes with minimal preprocessing.

Storage Conditions: Store at 15–30°C.

Maxwell® RSC PureFood GMO and Authentication Kit

Product	Size	Cat.#
Maxwell® RSC PureFood GMO and Authentication Kit	48 preps	AS1600
Available Separately	**Size**	**Cat.#**
CTAB Buffer	100 ml	MC1411

Not for Medical Diagnostic Use.

Description: The Maxwell® RSC PureFood GMO and Authentication Kit used with the Maxwell® RSC Instrument is designed to provide an easy and automated method for efficient purification of DNA used in PCR-based testing for Genetically Modified Organism (GMO) DNA sequences and PCR-based food and ingredient authentication.

The Maxwell® RSC Instrument is supplied with preprogrammed purification methods and is designed for use with the predispensed reagent cartridges, maximizing simplicity and convenience. The instrument can purify DNA from 1 to 16 raw and processed food samples including corn, soybeans, canola, ground pork, ground beef, pork gelatin, breaded fish, tortillas, corn chips and rice cakes in approximately 40 minutes.

Features:

- **Use an Optimized System:** Extract nucleic acid from a variety of food samples.
- **Rely on Consistent Performance:** Experience less variability compared to traditional competing methods.
- **Take Advantage of Walkaway Automation:** Achieve faster results. Free up laboratory resources to focus on higher value activities.
- **Work with an Easy-to-Use Kit:** Perform minimal protocol steps and no organic extractions. Quickly purify up to 16 food samples in less than 60 minutes with minimal preprocessing.

Storage Conditions: Store at 15–30°C.

Maxwell® RSC Plant RNA Kit

Product	Size	Cat.#
Maxwell® RSC Plant RNA Kit	48 preps	AS1500

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Maxwell® RSC Plant RNA Kit is used with the Maxwell® RSC Instruments to provide an easy method for efficient, automated purification of RNA from plant tissue samples. The kit provides the reagents required for processing 48 samples and uses prefilled cartridges for purification, maximizing simplicity and convenience. The Maxwell® RSC Instrument can process from 1 to 16 samples and the Maxwell® RSC 48 can process 1 to 48 samples in under an hour. The purified RNA can be used directly in a variety of downstream applications including RT-qPCR, gel electrophoresis, microarrays and Next Gen sequencing.

Features:

- Extracts amplifiable nucleic acids with minimal contaminants and enzyme inhibitors.
- Provides consistent extraction; less variability compared to traditional methods (CTAB and manual spin columns).
- Purifies up to 48 plant tissue samples in less than 60 minutes with minimal preprocessing and no organic reagents.

Storage Conditions: Store at 15–30°C.

Available in the Helix® on-site stocking system

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Maxwell® 16 LEV Plant DNA Kit

Product	Size	Cat.#
Maxwell® 16 LEV Plant DNA Kit	48 preps	AS1420

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Maxwell® 16 LEV Plant DNA Kit is used with the Maxwell® 16 Instrument to provide an easy method for efficient, automated purification of genomic DNA (gDNA) from plant tissue samples. The Maxwell® 16 Instrument is supplied with preprogrammed purification methods and is designed for use with predispensed reagent cartridges, maximizing simplicity and convenience. The instrument can process up to 16 samples in 45 minutes, and the purified DNA can be used directly in a variety of downstream applications, including PCR and agarose gel electrophoresis.

Features:

- **Optimized System:** Extract nucleic acid from corn, soybean and *Arabidopsis* tissue samples. The kit provides amplifiable nucleic acids compatible with downstream amplifications such as qPCR with minimal contaminants and enzyme inhibitors.
- **Consistent Performance:** Experience less variability compared to traditional competing methods (CTAB and manual spin columns).
- **Walkaway Automation:** Achieve faster results. Free up laboratory resources to focus on higher value activities.
- **Easy to Use Kit:** Perform minimal protocol steps and no organic extractions. Quickly purify up to 16 plant tissue samples in less than 60 minutes with minimal preprocessing.

Storage Conditions: Store at 15–30°C.

Maxwell® 16 LEV Plant RNA Kit

Product	Size	Cat.#
Maxwell® 16 LEV Plant RNA Kit	48 preps	AS1430

AS1430 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Maxwell® 16 LEV Plant RNA Kit is used with the Maxwell® 16 Research Instrument (Cat.# AS2000) to provide an easy method for efficient, automated purification of RNA from plant tissue samples. The Maxwell® 16 Instrument is supplied with preprogrammed purification methods and is designed for use with the predispensed reagent cartridges supplied in the Maxwell® 16 LEV Plant RNA Kit. The instrument can process from 1 to 16 samples in under an hour, and the purified RNA can be used directly in downstream applications including real-time RT-qPCR, gel electrophoresis, microarrays and sequencing (e.g., NGS and Sanger).

Features:

- Consistent processing and higher yields; less re-isolation of samples, reducing costs and increasing reliability of results.
- No organic extraction and minimal preprocessing required.

Storage Conditions: Store at 15–30°C.

Water Testing

Water-Glo™ Microbial Water Testing Kit

Product	Size	Cat.#
Water-Glo™ Complete Aqueous	1 each	AM1001
Water-Glo™ Reagents Aqueous	1 each	AM1002
Water-Glo™ 96 Reagents Aqueous	1 each	AM1003
Water-Glo™ Reagents Organic	1 each	AM1004
Water-Glo™ 96 Reagents Organic	1 each	AM1005
Available Separately	**Size**	**Cat.#**
Water-Glo™ Organic Wash Solution	50ml	AM1041

Not for Medical Diagnostic Use.

Description: Bacteria present in water samples cause issues such as biofilm formation (membrane fouling) and microbially induced or influenced corrosion (MIC). Traditional testing methods such as heterotrophic plate count (HPC) requires days of culturing bacteria. By the time you find out there's contamination, it's already too late. The Water-Glo™ System is based on ATP bioluminescence technology, allowing consistent low-level detection of all live microbes in minutes instead of days. It's the ideal early warning system to protect your process.

Features:

- Get results in minutes
- Measure up to 96 samples at once
- Detect all live microbes in freshwater, seawater or wastewater

Storage Conditions: Store at 15–30°C.

BacTiter-Glo™ Microbial Cell Viability Assay

Product	Size	Cat.#
BacTiter-Glo™ Microbial Cell Viability Assay	10 ml	G8230
	10 × 10 ml	G8231
	100 ml	G8232
	10 × 100 ml	G8233
Available Separately	**Size**	**Cat.#**
rATP, 10mM	0.5 ml	P1132

G8230, G8231, G8232, G8233 For Research Use Only. Not for Use in Diagnostic Procedures. P1132 For Laboratory Use.

Description: The BacTiter-Glo™ Microbial Cell Viability Assay provides a method for determining the number of viable microbial cells in culture based on quantitation of the ATP present. ATP is an indicator of metabolically active cells. The homogeneous assay procedure involves adding a single reagent (BacTiter-Glo™ Reagent) directly to bacterial cells cultured in medium and measuring luminescence. This assay format reduces pipetting errors that may be introduced during the multiple steps required by other methods of ATP measurement. The formulation of the reagent supports bacterial cell lysis and generation of a luminescent signal in an "add-mix-measure" format. The luminescent signal is proportional to the amount of ATP present, which is directly proportional to the number of viable cells in culture. The assay relies on the properties of a proprietary thermostable luciferase (Ultra-Glo™ Recombinant Luciferase) and a proprietary buffer formulation for extracting ATP from bacteria. The assay has been shown to detect a variety of bacteria and fungi.

Features:

- **Simplify Microbial Detection:** The "add-mix-measure" format reduces the number of handling steps to fewer than that required for similar ATP assays, with no separate lysis step, and no injectors required, allowing easy automation.
- **Get Results Quickly:** Data can be recorded in 5 minutes or less after adding reagent and mixing. Superior sensitivity allows you to detect growth or toxicity quickly after inoculation.
- **Increase Your Sensitivity:** Measure ATP from as few as 10 bacterial cells, 1,000-fold more sensitive than absorbance (O.D.) readings.
- **Choose Your Format:** Can be used with various multiwell-plate or single-use formats. Data can be recorded by luminometer or CCD camera.
- **Process Plates Consecutively:** The "glow-type" luminescent signal is stable, with a half-life generally over 30 minutes.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: For long-term storage, the lyophilized BacTiter-Glo™ Substrate and BacTiter-Glo™ Buffer should be stored at –20°C.

ENLITEN® ATP Assay System

Product	Size	Cat.#
ENLITEN® ATP Assay System	100 assays	FF2000

For in vitro use only.

Description: The ENLITEN® ATP Assay System can be used to measure ATP levels for the indirect detection of biocontamination on food processing surfaces, in cosmetics and beverages or to assay for enzymes that degrade ATP and to quantitate ATP in biological fluids.

Features:

- **Less Variation:** Stable light output.
- **User Friendly:** Easy-to-prepare reagents.
- **Performance:** Fast and convenient assay method.
- **Sensitive:** Detects as little as 10^{-15} moles of ATP.

Storage Conditions: Store at –20°C unopened. See product insert for individual component storage conditions before and after opening.

ENLITEN® rLuciferase/Luciferin Reagent

Product	Size	Cat.#
ENLITEN® rLuciferase/Luciferin Reagent	100 assays	FF2021

For in vitro use only.

Description: The ENLITEN® rLuciferase/Luciferin Reagent is intended for the rapid and quantitative detection of ATP in liquid samples. The reagent is designed to measure 10^{-11} to 10^{-15} moles of ATP. Some of the applications may include the indirect measurement of bacteria, yeasts and fungi on surfaces or in products, assaying enzymes that degrade ATP or quantitation of ATP in biological fluids.

Features:

- **Less Variation:** Stable light output.
- **User Friendly:** Easy-to-prepare reagents.
- **Performance:** Fast and convenient assay method.
- **Sensitive:** Detects as little as 10^{-15} moles of ATP.

Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system

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ADME Assays

CYP450 Assay Systems

Product	Size	Cat.#
P450-Glo™ CYP2B6 Assay	10 ml	V8321
	50 ml	V8322
P450-Glo™ CYP1A2 Induction/Inhibition Assay	10 ml	V8421
	50 ml	V8422
P450-Glo™ CYP3A4 Assay with Luciferin-IPA	10 ml	V9001
	50 ml	V9002
P450-Glo™ CYP3A4 Assay (Luciferin-PPXE)	10 ml	V8911
DMSO-Tolerant Assay	50 ml	V8912
P450-Glo™ CYP3A4 Assay (Luciferin-PFBE)	10 ml	V8901
Cell-Based/Biochemical Assay	50 ml	V8902
P450-Glo™ CYP1A1 Assay	10 ml	V8751
	50 ml	V8752
P450-Glo™ CYP1B1 Assay	10 ml	V8761
	50 ml	V8762
P450-Glo™ CYP1A2 Assay	10 ml	V8771
	50 ml	V8772
P450-Glo™ CYP2C8 Assay	10 ml	V8781
	50 ml	V8782
P450-Glo™ CYP2C9 Assay	10 ml	V8791
	50 ml	V8792
P450-Glo™ CYP3A4 Assay	10 ml	V8801
	50 ml	V8802
P450-Glo™ CYP3A7 Assay	10 ml	V8811
	50 ml	V8812
P450-Glo™ CYP2C19 Assay	10 ml	V8881
	50 ml	V8882
P450-Glo™ CYP2D6 Assay	10 ml	V8891
	50 ml	V8892
Available Separately		
NADPH Regeneration System	1,000 assays	V9510

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The **P450-Glo™ CYP450 Assays** provide a homogeneous, luminescent method for measuring cytochrome P450 activity. The assays are designed to measure the activities of P450s from recombinant and native sources and for testing the effects of analytes such as drugs and new chemical entities on P450 activities. These luminescent assays exhibit exquisite sensitivity, low background signals and broad dynamic range.

P450-Glo™ Assays employ luminogenic P450 substrates that are derivatives of beetle luciferin, a substrate for luciferase enzymes. The derivatives are not substrates for luciferase but are converted by P450s to luciferin, which in turn reacts with luciferase to produce light that is directly proportional to the activity of the P450.

The P450-Glo™ Assays generate a "glow-type" luminescent signal, produced using derivatized luciferins as P450 substrates and a recombinant stabilized luciferase (Ultra-Glo™ Luciferase) coupled with a proprietary buffer system. The half-life of the luminescent output is greater than two hours, eliminating the need for luminometers with injectors and allowing batch plate processing. The formulation also minimizes the incidence of false positives due to inhibition of luciferase by analytes when screening for cytochrome P450 inhibitors.

Drug-induced changes in expression of CYP450 genes are a key cause of drug-drug interactions. The ability to measure enzymatic activity of the specific human isoforms that are induced is critical for developing safer drugs. Currently, the most important inducible human isoforms are CYP1A2, CYP2B6 and CYP3A4. The luciferin-based substrates are readily taken up by cells and rapidly converted into luciferin inside the cell, which reduces the incubation time required (typically 30–60 minutes). The low background and high signal-to-noise ratios produced mean less starting material is required.

Dimethyl sulfoxide (DMSO), a common solvent used to solubilize chemical compounds, can significantly inhibit the activity of the 3A4 isoform of cytochrome P450, even at low concentrations (<0.1%).The P450-Glo™ CYP3A4 System (Luciferin-PPXE) DMSO-Tolerant Assay is specifically designed to tolerate DMSO in the 3A4 reaction. The assay exhibits little to no change in the signal-to-background ratio in the presence of 0.2% DMSO compared to a no-DMSO control.

Features:

- **Obtain Reliable Results:** The broad dynamic range, low background and better sensitivity result in less ambiguous data.
- **Avoid Fluorescence Interference:** Luminescent output eliminates interference from fluorescent test compounds.
- **Save Time:** Homogeneous assay with simple "add-and-read" format.
- **Avoid False Hits:** Special formulation results in low false-hit rate.
- **Save Money:** Scalable to 384-well format, reducing cost per well.
- **Automate This Assay:** Validated automated methods available at: **www.promega.com/automethods/**
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store the CYP1A2, CYP2C9 and CYP3A4 membranes at –70°C. Cytochrome P450 may lose activity with repeated freeze-thaw cycles. Avoid multiple freeze-thaw cycles by dispensing the CYP1A2, CYP2C9 and CYP3A4 membranes into single-use aliquots (e.g., 50µl for 96 reactions). Store aliquots at –70°C. All other components can be stored at –20°C or –70°C and protected from light.

P450-Glo™ CYP450 Screening Systems

Product	Size	Cat.#
P450-Glo™ CYP3A4 Screening System with Luciferin-IPA	1,000 assays	V9920
P450-Glo™ CYP2B6 Screening System	1,000 assays	V9781
P450-Glo™ CYP3A4 Screening System (Luciferin-PPXE) DMSO-Tolerant Assay	1,000 assays	V9910
P450-Glo™ CYP1A2 Screening System	1,000 assays	V9770
P450-Glo™ CYP2C9 Screening System	1,000 assays	V9790
P450-Glo™ CYP3A4 Screening System	1,000 assays	V9800
P450-Glo™ CYP2C19 Screening System	1,000 assays	V9880
P450-Glo™ CYP2D6 Screening System	1,000 assays	V9890
Available Separately		
NADPH Regeneration System	1,000 assays	V9510

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The P450-Glo™ Screening Systems provide a complete set of reagents for performing luminescent cytochrome P450 assays. The systems include a membrane preparation containing recombinant human cytochrome P450 enzyme, a luminogenic cytochrome P450 substrate appropriate for the enzyme, an NADPH Regeneration System, reaction buffer, Luciferin Detection Reagent and Luciferin-Free Water. The membranes are prepared from baculovirus-infected insect cells and contain human cytochrome P450 and P450 reductase (and cytochrome b5 for CYP2C9 and CYP3A4). The P450-Glo™ Screening Systems also contain a membrane fraction devoid of cytochrome P450 activity as a negative control. The assays are ideal for testing the effects of drugs and new chemical entities on cytochrome P450 enzyme activities.

The cytochrome P450 reaction is performed by incubating a luminogenic cytochrome P450 substrate with a cytochrome P450 enzyme and the NADPH Regeneration System. The luminogenic P450-Glo™ Substrates are derivatives of beetle luciferin ((4S)-4,5-dihydro-2-(6-hydroxybenzothiazolyl)-4-thiazolecarboxylic acid or D-luciferin), a substrate of firefly luciferase. The P450-Glo™ Substrates do not react with luciferase but are converted by cytochrome P450 to luciferin, which in turn reacts with luciferase to produce light. Light is used to monitor cytochrome P450 activity because the amount of light produced is directly proportional to the amount of D-luciferin produced by cytochrome P450.

Dimethyl sulfoxide (DMSO), a common solvent used to solubilize chemical compounds, can significantly inhibit the activity of the 3A4 isoform of cytochrome P450, even at low concentrations (<0.1%). The P450-Glo™ CYP3A4 Screening System (Luciferin-PPXE) DMSO-Tolerant Assay is specifically designed to tolerate DMSO in the 3A4 reaction. The assay exhibits little to no change in the signal-to-background ratio in the presence of 0.2% DMSO compared to a no-DMSO control.

After the cytochrome P450 reaction has been performed, the reconstituted Luciferin Detection Reagent is added. This reagent simultaneously stops the cytochrome P450 reaction and initiates a stable glow-type luminescent signal. The glow-type reaction produces a stable signal and eliminates the need for strictly timed luminescence detection. Protocols are configured for multiwell plate formats but can be easily adapted for single-tube applications.

Features:

- **Complete Systems:** The systems include a membrane preparation containing recombinant human cytochrome P450 enzyme, a luminogenic cytochrome P450 substrate appropriate for the enzyme, an NADPH regeneration system, reaction buffer, Luciferin Detection Reagent and Luciferin-Free Water.
- **Speed:** The luminescent format eliminates the need for time-consuming analyses such as HPLC.
- **Robust:** Z′ values greater than 0.8 in either 96- or 384-well plate formats. Highly predictive results.
- **Luminescent Output:** No interference by fluorescent compounds.
- **Broad Dynamic Range and Low Background:** Excellent sensitivity.
- **Low False-Positive Rate:** Use of a proprietary stabilized firefly luciferase and a proprietary luciferase assay formulation minimizes the incidence of false positives due to inhibition of luciferase by analytes when screening for cytochrome P450 inhibitors.
- **Scalable:** Easily scalable to 384-well plate format.
- **Automate This Assay:** Validated automated methods available at: **www.promega.com/automethods/**

Storage Conditions: Store the CYP1A2, CYP2C9 and CYP3A4 membranes at –70°C. Cytochrome P450 may lose activity with repeated freeze-thaw cycles. Avoid multiple freeze-thaw cycles by dispensing the CYP1A2, CYP2C9 and CYP3A4 membranes into single-use aliquots (e.g., 50µl for 96 reactions). Store aliquots at –70°C. All other components can be stored at –20°C or –70°C and protected from light. The reconstituted Luciferin Detection Reagent can be stored at –20°C for up to 3 months. For convenience, the reconstituted Luciferin Detection Reagent can be stored at room temperature (approximately 23°C) without loss of activity for 24 hours or at 4°C for 1 week. Avoid multiple freeze-thaw cycles of all components.

Available in the Helix® on-site stocking system

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Luciferin Detection Reagent

Product	Size	Cat.#
Luciferin Detection Reagent	50 ml	V8921
	10 ml	V8920
Luciferin Detection Reagent with esterase	50 ml	V8931
	10 ml	V8930

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Luciferin Detection Reagent (LDR) is used to detect luciferin formed following enzymatic modification of pro-luciferin substrates. Enzymes such as CYP450s convert specific pro-luciferin substrates into luciferin, which is then converted into light following the addition of LDR through the action of Ultra-Glo™ Luciferase. The LDR reagent simultaneously stops the initial enzymatic reaction and initiates a stable glow-type luminescent signal with a half-life >2 hours.

Pgp-Glo™ Assay Systems

Product	Size	Cat.#
Pgp-Glo™ Assay System	10 ml	V3591
Pgp-Glo™ Assay System with P-glycoprotein	10 ml	V3601

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Pgp-Glo™ Assay Systems provide the necessary reagents for performing luminescent P-glycoprotein (Pgp) ATPase assays. Pgp, also known as MDR1 and ABCB1, is a 170kDa integral plasma membrane protein that functions as an ATP-dependent drug efflux pump and plays an important role in multidrug resistance and certain adverse drug-drug interactions. Compounds that interact with Pgp can be identified as stimulators or inhibitors of its ATPase activity. Compounds that are substrates for transport by Pgp typically stimulate its ATPase activity.

The Pgp-Glo™ Assay detects the effects of compounds on recombinant human Pgp in a cell membrane fraction. The assay relies on the ATP dependence of the light-generating reaction of firefly luciferase. ATP is first incubated with Pgp; then the Pgp ATPase reaction is stopped, and the remaining unmetabolized ATP is detected as a luciferase-generated luminescent signal. Pgp-dependent decreases in luminescence reflect ATP consumption by Pgp; thus the greater the decrease in signal, the higher the Pgp activity. Accordingly, samples containing compounds that stimulate the Pgp ATPase will have significantly lower signals than untreated samples.

Features:

- **Complete System:** Cat.# V3591 includes all the reagents required to run the assay except the P-glycoprotein: A Pgp reaction buffer, MgATP, Verapamil, Na_3VO_4, and a lyophilized ATP detection reagent and its reconstitution buffer. Cat.# V3601 includes all the reagents provided in the Pgp-Glo™ System with the addition of Recombinant Human Pgp Membranes to provide a completely optimized kit.
- **Stable Activities:** "Glow-type" signal allows processing of multiple samples without concern of variability over time.
- **Low False-Positive Rate:** Use of a proprietary stabilized firefly luciferase and a proprietary luciferase assay formulation minimizes the incidence of false positives due to inhibition of luciferase by analytes when screening for compounds that affect Pgp activity.
- **Simple:** The simple protocol makes the assay amenable to high-throughput screening in multiwell plates.

Storage Conditions: Store Recombinant Human Pgp Membranes at –70°C. All other components can be stored at –70°C or –20°C, protected from light.

MAO-Glo™ Assay Systems

Product	Size	Cat.#
MAO-Glo™ Assay	200 assays	V1401
	1,000 assays	V1402

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The MAO-Glo™ Assay provides a homogeneous luminescent method for measuring monoamine oxidase (MAO) activity from recombinant and native sources and for testing the effects of test compounds on MAO activity. The MAO-Glo™ Assay is performed by incubating the MAO enzyme source with a luminogenic MAO substrate. The substrate of the MAO-Glo™ Assay is a derivative of beetle luciferin. Upon reaction with MAO, the derivative is converted into luciferin, which in turn reacts with luciferase to produce light. The amount of light produced is directly proportional to the activity of MAO.

After the MAO reaction has been performed, the reconstituted Luciferin Detection Reagent is added. The reagent simultaneously stops the MAO reaction and initiates a stable glow-type luminescent signal with a half-life greater than 5 hours. This eliminates the need for strictly timed luminescent detection.

The MAO-Glo™ Assay includes a luminogenic MAO substrate, two MAO Reaction Buffers (one that can be used with either MAO A or MAO B enzyme and one that is designed specifically for MAO B), a lyophilized Luciferin Detection Reagent and the Luciferin Detection Buffer. The user supplies the sample material containing MAO. Protocols are configured for multiwell plate formats but easily can be adapted for single-tube applications.

Features:

- **Speed:** The luminescence format eliminates the need for time-consuming analyses such as HPLC.
- **Simplified Method:** The simple "add and read" protocol makes the assay amenable to high-throughput screening in multiwell plates.
- **Greater Sensitivity:** Less MAO enzyme is required in these assays than in typical HPLC or fluorometric methods because of the enhanced sensitivity.
- **No Fluorescence Interference:** Luminescent output eliminates interference from fluorescent test compounds.
- **Stable Signal:** "Glow-type" luminescence provides a stable signal with a half-life of greater than 5 hours. This eliminates the need for strictly timed luminescent detection.

Storage Conditions: Store at –20°C protected from light.

GloResponse™ Luciferase Reporter Cell Lines

Product	Size	Cat.#
GloResponse™ CRE-*luc2P* HEK293 Cell Line	2 vials	E8500
GloResponse™ NFAT-RE-*luc2P* HEK293 Cell Line	2 vials	E8510
GloResponse™ NF-κB-RE-*luc2P* HEK293 Cell Line	2 vials	E8520

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The GloResponse™ Luciferase Reporter Cell Lines contain optimized, state-of-the-art luciferase reporter technology integrated into a cell line. This allows the rapid development of a reporter assay based on the pathway of interest regulating the luciferase gene. Assays configured using the GloResponse™ Cell Lines are amenable for high-throughput screening. These assays typically have greater response dynamics (fold of induction) than other assay formats and good quality as indicated by the high Z´ values. GloResponse™ Cell Lines were developed to study a variety of signaling pathways. Activators of these pathways may be native to the HEK293 cell line. Activity of non-native activators can be studied after they have been introduced by transfection.

GPCRs regulate a wide-range of biological functions and are one of the most important target classes for drug discovery. GPCR signaling pathways can be categorized into three classes based on the G protein α-subunit involved: Gs, Gi/o and Gq. The GloResponse™ CRE-*luc2P* HEK293 Cell Line can be used to study and configure screening assays for Gs- and Gi/o-coupled GPCRs, which signal through cAMP and the cAMP Response Element (CRE). For Gq-coupled GPCRs, which signal through calcium ion release and activate the Nuclear Factor of Activated T-Cells response element (NFAT-RE), the GloResponse™ NFAT-RE-*luc2P* HEK293 Cell Line should be used.

NF-κB-REs are the DNA binding sequences for the NF-κB transcription factor complex, which is responsible for regulating inflammation, immune response, cell growth and apoptosis. The GloResponse™ NF-κB-RE-*luc2P* HEK293 Cell Line is designed for rapid and convenient analysis of any cellular response that results in modulation of NF-κB activities.

The GloResponse™ Cell Lines were generated by clonal selection of HEK293 cells stably transfected with pGL4-based vectors carrying specific response elements for the pathway of interest. These cell lines incorporate the improvements developed for the pGL4 family of reporter vectors for enhanced performance. The destabilized *luc2P* luciferase reporter is used for improved responsiveness to transcriptional dynamics. The *luc2P* gene is codon optimized for enhanced expression in mammalian cells, and the pGL4 plasmid backbone was engineered to reduce background reporter expression. The result is a cell line with very high induction levels when the pathway of interest is activated.

Features:

- **Convenient:** Prebuilt, optimized luciferase reporter cell lines.
- **Robust:** Large assay window provided by high levels of induction and low background expression.
- **Faster Results:** Improved responsiveness to transcriptional dynamics with destabilized luciferase.

Storage Conditions: Place frozen cells in storage at less than or equal to –140°C (mechanical deep freeze or vapor phase liquid nitrogen) until you are ready to thaw and propagate them. We strongly recommend that the cells are propagated, using the provided procedure, as soon as possible. This will ensure the optimal cell viability and assay performance.

Available in the Helix® on-site stocking system
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Signaling Pathway Analysis (Minimal Promoter-Driven) Firefly Luciferase Vectors

Product	Size	Cat.#
pGL4.37[*luc2P*/ARE/Hygro] Vector	20 µg	E3641
pGL4.38[*luc2P*/p53 RE/Hygro] Vector	20 µg	E3651
pGL4.39[*luc2P*/ATF6 RE/Hygro] Vector	20 µg	E3661
pGL4.40[*luc2P*/MRE/Hygro] Vector	20 µg	E4131
pGL4.41[*luc2P*/HSE/Hygro] Vector	20 µg	E3751
pGL4.42[*luc2P*/HRE/Hygro] Vector	20 µg	E4001
pGL4.43[*luc2P*/XRE/Hygro] Vector	20 µg	E4121
pGL4.44[*luc2P*/AP1 RE/Hygro] Vector	20 µg	E4111
pGL4.45[*luc2P*/ISRE/Hygro] Vector	20 µg	E4141
pGL4.47[*luc2P*/SIE/Hygro] Vector	20 µg	E4041
pGL4.48[*luc2P*/SBE/Hygro] Vector	20 µg	E3671
pGL4.49[*luc2P*/TCF-LEF RE/Hygro] Vector	20 µg	E4611
pGL4.52[*luc2P*/STAT5RE/Hygro] Vector	20 µg	E4651
pGL4.29[*luc2P*/CRE/Hygro] Vector	20 µg	E8471
pGL4.30[*luc2P*/NFAT-RE/Hygro] Vector	20 µg	E8481
pGL4.32[*luc2P*/NF-κB-RE/Hygro] Vector	20 µg	E8491
pGL4.33[*luc2P*/SRE/Hygro] Vector	20 µg	E1340
pGL4.34[*luc2P*/SRF-RE/Hygro] Vector	20 µg	E1350
Available Separately		
pGL4.23[*luc2*/minP] Vector	20 µg	E8411
pGL4.24[*luc2P*/minP] Vector	20 µg	E8421
GloResponse™ NFAT-RE-*luc2P* HEK293 Cell Line	2 vials	E8510
GloResponse™ NF-κB-RE-*luc2P* HEK293 Cell Line	2 vials	E8520
pGL4.25[*luc2CP*/minP] Vector	20 µg	E8431
pGL4.26[*luc2*/minP/Hygro] Vector	20 µg	E8441
pGL4.27[*luc2P*/minP/Hygro] Vector	20 µg	E8451
pGL4.28[*luc2CP*/minP/Hygro] Vector	20 µg	E8461
GloResponse™ CRE-*luc2P* HEK293 Cell Line	2 vials	E8500

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Description: Creating a cell line with an indicator of a functional signaling pathway is useful for deciphering the components in a signaling pathway. These tools are made by insertion of multiple repeats of a response element upstream of a minimal promoter (minP). Promega has designed vectors that report the activity of a variety of pathways using the optimized *luc2* firefly luciferase gene in the pGL4 backbone. These vectors also have a hygromycin resistance selectable marker, allowing use either in transient transfection experiments or for selection of a stable cell line.

Also available for construction of pathway reporters are minimal promoter (minP) vectors with three varieties of engineered firefly luciferase genes: *luc2, luc2P* or *luc2CP*. The *luc2* gene is engineered to remove most cryptic transcription factor binding sites and improve mammalian expression through codon optimization. The *luc2P* and *luc2CP* and RapidResponse™ genes are *luc2* genes appended with degradation sequences to influence the cellular half-life of the luc2 gene. The RapidResponse™ genes respond more rapidly to stimuli but at the expense of signal intensity. The *luc2P* (1-hour half-life) gene responds more rapidly than *luc2* (3-hour half-life) with moderate signal intensity, and the *luc2CP* (0.4-hour half-life) responds more quickly with the lowest signal intensity. The minP vectors are available with or without selectable markers (hygromycin). To speed research, several pre-designed response element vectors are available already assembled in the pGL4.27 Vector. Some of these also are available stable cell lines (GloResponse™ Cell Lines).

Features:

- Pre-designed vectors remove the need to clone and validate an assay.
- **Increased Reporter Gene Expression:** Codon optimization of synthetic genes for mammalian expression.
- **Reduced Background and Risk of Expression Artifacts:** Removal of cryptic DNA regulatory elements and transcription factor binding sites.
- **Improved Temporal Response:** Rapid Response™ technology using destabilized luciferase genes.
- **Easy Transition from Transient to Stable Cells:** Choice of mammalian selectable markers.

Storage Conditions: Store at –20°C.

Apoptosis Assays

RealTime-Glo™ Annexin V Apoptosis and Necrosis Assay

Product	Size	Cat.#
RealTime-Glo™ Annexin V Apoptosis Assay	100 assays	JA1000
	1,000 assays	JA1001
RealTime-Glo™ Annexin V Apoptosis and Necrosis Assay	100 assays	JA1011
	1,000 assays	JA1012

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The RealTime-Glo™ Annexin V Apoptosis and Necrosis Assay measures the real-time exposure of phosphatidylserine (PS) on the outer leaflet of cell membranes during the apoptotic process. Annexin V luciferase fusion proteins supplied in the assay reagent bind to PS during early apoptosis and are detected with a simple luminescence signal. The reagent also includes a DNA-binding dye, which enters the cell and generates a fluorescent signal upon loss of membrane integrity.

The combination and timing of luminescent and fluorescent signals is used to differentiate secondary necrosis occurring during late apoptosis from necrosis caused by other cytotoxic events.

The assay is nonlytic and the simple "add-and-read" method allows multiple readings from a single assay well. Apoptosis can be monitored in real time, without the need for multiple plates, complicated processing or specialized detection equipment. A multimode reader capable of detecting luminescence and fluorescence is the only instrument required.

Features:

- No-wash, one-step Annexin V binding assay.
- **Nonlytic:** allows continual monitoring of cell state to accurately determine apoptotic onset.
- Scalable for high-throughput screening applications.

Storage Conditions: Store at –30°C to –10°C.

ApoTox-Glo™ Triplex Assay

Product	Size	Cat.#
ApoTox-Glo™ Triplex Assay	10 ml	G6320
	5 × 10 ml	G6321

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ApoTox-Glo™ Triplex Assay combines three assay chemistries to easily assess viability, cytotoxicity and apoptosis events in the same cell-based assay well. First, viability and cytotoxicity are determined by measuring two differential protease biomarkers simultaneously with the addition of a single nonlytic reagent containing two peptide substrates. The live-cell protease activity is restricted to intact viable cells and is measured using a fluorogenic, cell-permeant peptide substrate (GF-AFC Substrate). The substrate enters intact cells, where it is cleaved to generate a fluorescent signal proportional to the number of living cells. This live-cell protease activity marker becomes inactive upon loss of membrane integrity and leakage into the surrounding culture medium. A second, cell-impermeant, fluorogenic peptide substrate (bis-AAF-R110 Substrate) is used simultaneously to measure dead-cell protease activity that has been released from cells that have lost membrane integrity. This results in ratiometric, inversely correlated measures of cell viability and cytotoxicity. The ratio of viable cells to dead cells is independent of cell number and, therefore, can be used to normalize data. A second reagent containing luminogenic DEVD-peptide substrate for caspase-3/7 and Ultra-Glo™ Recombinant Thermostable Luciferase is added. Caspase-3/7 cleavage of the substrate releases luciferin, which is a substrate for luciferase and generates light. The light output, measured with a luminometer, correlates with caspase-3/7 activation as a key indicator of apoptosis.

Features:

- **Measure Viability, Cytotoxicity and Apoptosis in the Same Sample Well:** Determine mechanism of cell death for cells in the same sample well.
- **Easily Implement:** Assay follows a simple sequential "add-mix-measure" format.
- **Normalize Data with a Built-In Control:** The ratio of the number of live cells/number of dead cells is independent of cell number and normalizes data. This normalization makes results more comparable well-to-well, plate-to-plate and day-to-day.
- **Easily Automate this Flexible Assay:** Component volumes can be scaled to meet throughput needs. Amenable to automation in 96- and 384-well plates.
- **Improve Efficiency and Save Lab Budget:** Reduce cell culture and labor costs by performing three assays in a single well.

Storage Conditions: Store all components at –20°C protected from light.

Available in the Helix® on-site stocking system

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ApoLive-Glo™ Multiplex Assay

Product	Size	Cat.#
ApoLive-Glo™ Multiplex Assay	10 ml	G6410
	5 × 10 ml	G6411

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ApoLive-Glo™ Multiplex Assay measures both the number of viable cells as a marker of cytotoxicity and caspase activation as a marker of apoptosis within a single assay well to determine the mechanism of cell death. The first part of the assay measures the activity of a protease marker of cell viability. The live-cell protease activity is restricted to intact viable cells and is measured using a fluorogenic, cell-permeant, peptide substrate (glycyl-phenylalanyl-amino fluorocoumarin; GF-AFC). The substrate enters intact cells, where it is cleaved by the live-cell protease activity to generate a fluorescent signal proportional to the number of living cells. This live-cell protease becomes inactive upon loss of cell membrane integrity and leakage into the surrounding culture medium. The second part of the assay uses the Caspase-Glo® Assay technology to detect caspase activation, a key biomarker of apoptosis. The Caspase-Glo® Assay provides a luminogenic caspase-3/7 substrate, which contains the tetrapeptide sequence DEVD, in a reagent optimized for caspase activity, luciferase activity and cell lysis. Adding the Caspase-Glo® 3/7 Reagent in an 'add-mix-measure' format results in cell lysis, followed by caspase cleavage of the substrate and generation of a 'glow-type' luminescent signal produced by luciferase. Luminescence is proportional to the amount of caspase activity present.

Features:

- **Measure Viability and Apoptosis in the Same Sample Well:** Accurately determine the mechanism of cell death in less time with less sample.
- **Easy to Implement:** The assay uses a simple sequential 'add-mix-measure' format.
- **Normalize Caspase Data with Viability Control:** The ratio of caspase activity to viable cell is useful for determining the extent of caspase activation and for normalizing cell numbers.
- **Flexible and Easily Automated:** The volumes of each assay component can be scaled to meet throughput needs, and the assay is amenable to automation in 96- and 384-well plates.
- Reveal cell death even if the window of caspase activity is missed.
- **Multiplex with Other Assays:** The nonlytic nature of the first step of the assay allows further multiplexing with spectrally distinct fluorescent assay chemistries.

Storage Conditions: Store all components at –20°C protected from light.

Caspase-Glo® 3/7 Assay Systems

Product	Size	Cat.#
Caspase-Glo® 3/7 Assay	2.5 ml	G8090
	10 ml	G8091
	10 × 10 ml	G8093
	100 ml	G8092

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Caspase-Glo® 3/7 Assay provides a homogeneous luminescent assay that measures caspase-3/7 activities. The assay provides a proluminescent caspase-3/7 DEVD-aminoluciferin substrate and a proprietary thermostable luciferase in a reagent optimized for caspase-3/7 activity, luciferase activity and cell lysis. Adding the single Caspase-Glo® 3/7 Reagent in an "add-mix-measure" format results in cell lysis, followed by caspase cleavage of the substrate. This liberates free aminoluciferin, which is consumed by the luciferase, generating a "glow-type" luminescent signal. The signal is proportional to caspase-3/7 activity. The stabilized luciferase and proprietary buffer system improve assay performance across a wide range of assay conditions, and the assay is less likely to be affected by compound interference unlike fluorescent- or colorimetric-based assays. The Caspase-Glo® 3/7 Assay is designed for use with multiwell plate formats using either purified enzyme or cells in culture.

Features:

- **Simplify Apoptosis or Caspase Detection:** The "add-mix-measure" protocol makes the assay easy to automate; simply add an equal volume of reagent to sample volume.
- **Use Less Enzyme or Fewer Cells:** The low background luminescence results in excellent signal-to-noise ratios and superior sensitivity not achieved by other caspase formats, allowing assays to be performed in 96- or 384-well formats.
- **Decrease Assay Time:** No sample preparation or manipulation required, and no extended incubation times are necessary, as with fluorescence-based assays. Maximum sensitivity is achieved in as little as 0.25–1 hour.
- **Rely on a Performance-Tested Assay:** The assay delivers excellent Z′- factor values in cell and purified enzyme models.
- **Process Plates in Batch Mode:** The extended-glow signal allows the plates to be read over a 3-hour period of time for batch processing; no injectors required.
- **Get More Information:** Multiplex with other cell-based assays from Promega.
- **Automate This Assay:** Validated automated methods available at: **www.promega.com/automethods/**
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –20°C.

Caspase-Glo® 8 Assay Systems

Product	Size	Cat.#
Caspase-Glo® 8 Assay	2.5 ml	G8200
	10 ml	G8201
	100 ml	G8202

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Caspase-Glo® 8 Assay is a homogeneous luminescent assay that measures caspase-8 activity. The assay provides a proluminogenic caspase-8 substrate in a buffer system optimized for caspase activity, luciferase activity and cell lysis. The addition of a single Caspase-Glo® 8 Reagent in an "add-mix-read" format results in cell lysis, followed by caspase cleavage of the substrate and generation of a "glow-type" luminescent signal. The signal generated is proportional to the amount of caspase activity present. The Caspase-Glo® Reagent relies on the properties of a proprietary thermostable luciferase (Ultra-Glo™ Recombinant Luciferase), which generates the stable "glow-type" luminescent signal and improves performance across a wide range of assay conditions.

The system now includes a separate vial of a protease inhibitor, MG-132 Inhibitor, which may be used to reduce background, thus improving the performance of the Caspase-Glo® 8 Assay in cell-based applications.

Features:

- **Simplify Apoptosis or Caspase Detection:** The homogeneous "add-mix-read" protocol makes the assay easy to automate; simply add an equal volume of reagent to sample volume.
- **Use Less Enzyme:** The low background luminescence results in excellent signal-to-noise ratios and superior sensitivity not achieved by other caspase formats, allowing assays to be performed in 96- or 384-well formats.
- **Decrease Assay Time:** No sample preparation or manipulation required, and no extended incubation times are necessary as with fluorescent-based assays. Maximum sensitivity is achieved in as little as 0.5–1 hour.
- **Rely on a Performance-Tested Assay:** The assay delivers excellent Z′-factors in cell and purified enzyme models.
- **Get More Information:** Multiplex with other cell-based assays from Promega.
- **Experience Improved Caspase-8 Selectivity:** The Caspase-Glo® 8 Assay uses a luminogenic substrate containing the LETD sequence, which has been shown to be selective for caspase-8. The assay includes an optional proteasome inhibitor (MG-132), which when added to the Caspase-Glo® 8 Reagent significantly reduces nonspecific background in cell-based assays.
- **Automate This Assay:** Validated automated methods available at: **www.promega.com/automethods/**
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –20°C protected from light.

Caspase-Glo® 9 Assay Systems

Product	Size	Cat.#
Caspase-Glo® 9 Assay	2.5 ml	G8210
	10 ml	G8211
	100 ml	G8212

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Caspase-Glo® 9 Assay is a homogeneous luminescent assay that measures caspase-9 activity. The assay provides a proluminogenic caspase-9 substrate in a buffer system optimized for caspase activity, luciferase activity and cell lysis. The addition of a single Caspase-Glo® 9 Reagent in an "add-mix-read" format results in cell lysis, followed by caspase cleavage of the substrate and generation of a "glow-type" luminescent signal. The signal generated is proportional to the amount of caspase activity present. The Caspase-Glo® Reagent relies on the properties of a proprietary thermostable luciferase (Ultra-Glo™ Recombinant Luciferase), which generates the stable "glow-type" luminescent signal and improves performance across a wide range of assay conditions.

The system now includes a separate vial of a protease inhibitor, MG-132 Inhibitor, which may be used to reduce background, thus improving the performance of the Caspase-Glo® 9 Assay in cell-based applications.

Features:

- **Simplify Apoptosis or Caspase Detection:** The homogeneous "add-mix-read" protocol makes the assay easy to automate; simply add an equal volume of reagent to sample volume.
- **Use Less Enzyme:** The low background luminescence results in excellent signal-to-noise ratios and superior sensitivity not achieved by other caspase formats, allowing assays to be performed in 96- or 384-well formats.
- **Decrease Assay Time:** No sample preparation or manipulation required, and no extended incubation times are necessary as with fluorescent-based assays. Maximum sensitivity is achieved in as little as 0.5–1 hour.
- **Rely on a Performance-Tested Assay:** The assay delivers excellent Z′-factors in cell and purified enzyme models.
- **Get More Information:** Multiplex with other cell-based assays from Promega.
- **Experience Improved Caspase-9 Selectivity:** The Caspase-Glo® 9 Assay uses a luminogenic substrate containing the LEHD sequence, which has been shown to be selective for caspase-9. The assay includes an optional proteasome inhibitor (MG-132), which when added to the Caspase-Glo® 9 Reagent significantly reduces nonspecific background in cell-based assays.
- **Automate This Assay:** Validated automated methods available at: **www.promega.com/automethods/**
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –20°C protected from light.

Available in the Helix® on-site stocking system

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Apo-ONE® Homogeneous Caspase-3/7 Assay

Product	Size	Cat.#
Apo-ONE® Homogeneous Caspase-3/7 Assay	1 ml	G7792
	10 ml	G7790
	100 ml	G7791
Available Separately		
Apo-ONE® Homogeneous Caspase-3/7 Buffer	100 ml	G7781

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Apo-ONE® Homogeneous Caspase-3/7 Assay provides the necessary reagents for fast and sensitive measurement of active caspase-3 and -7 in a homogeneous format. The assay includes a profluorescent caspase-3/7 consensus substrate, rhodamine 110 bis-(N-CBZ-L-aspartyl-L-glutamyl-L-valyl-aspartic acid amide) (Z-DEVD-R110), and an optimized bifunctional cell lysis/activity buffer. The buffer efficiently lyses cultured mammalian cells and supports optimal caspase-3/7 enzymatic activity. The substrate and buffer are combined to make the Apo-ONE® Caspase-3/7 Reagent that is added directly to samples. Upon cleavage on the C-terminal side of the aspartate residue in the DEVD peptide substrate sequence by caspase-3/7 enzymes, the rhodamine 110 becomes fluorescent when excited at a wavelength of 498nm. The emission maximum is 521nm. The amount of fluorescent product generated is representative of the amount of active caspase-3/7 present in the sample.

Features:

- **Get Results Faster:** The simple "add-mix-measure" format combined with the high sensitivity of the assay dramatically decreases the "time to first result" by eliminating cumbersome sample preparation and lengthy incubation steps.
- **Use Less Enzyme or Fewer Cells:** Optimized caspase-3/7 activity buffer, in conjunction with the R110-labeled substrate, allows increased sensitivity over existing fluorescent caspase assay methods.
- **Adapt to Your Format and Throughput Needs:** The assay can be flexibly configured (from cuvette to 384-well plate) for use in high-throughput systems by maintaining a 1:1 ratio of sample to assay reagent and may be used with purified enzyme preparations, cell extracts or cultures of adherent, suspension or primary cells.
- **Get More Information:** Perform more than one assay on the same sample. This assay can be multiplexed with other assay methods such as the CellTiter-Blue® Assay (Cat.# G8080) or the Caspase-Glo® 8 or 9 Assays (Cat.# G8200 or G8210).
- **Automate This Assay:** Validated automated methods available at: **www.promega.com/automethods/**
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –20°C protected from light and moisture.

CaspACE™ FITC-VAD-FMK In Situ Marker

Product	Size	Cat.#
CaspACE™ FITC-VAD-FMK In Situ Marker	50 µl	G7461
	125 µl	G7462

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: CaspACE™ FITC-VAD-FMK In Situ Marker is a fluorescent analog of the pan caspase inhibitor Z-VAD-FMK (carbobenzoxy-valyl-alanyl-aspartyl-[O-methyl]-fluoromethylketone). The fluorescein isothiocyanate (FITC) group has been substituted for the carbobenzoxy (Z) N-terminal blocking group to create the fluorescent apoptosis marker. This structure allows delivery of the inhibitor into the cell where it irreversibly binds to activated caspases. The FITC label allows a single-reagent addition to assay for caspase activity in situ. The FITC-VAD-FMK is supplied as a 5mM solution in DMSO and is intended for in situ monitoring of caspase activity by fluorescence detection. The suggested concentration for use in anti-Fas-treated Jurkat cell culture is 10µM.

Features:

- **Simplify Your Protocol:** Add FITC-VAD-FMK, incubate, wash and view fluorescence.
- **Use a Variety of Detection Methods:** Detect apoptotic cells by fluorescence microscopy or flow cytometry; combine with other immunomarkers to assess cell populations or determine apoptotic frequency within a population; adaptable to high-throughput applications.
- **Get Results Faster:** Quick, single-reagent addition to cell culture; no preparation of cell extracts or long incubation steps. Use as a preliminary screen for apoptosis.
- **Get Reliable Results:** Synthesized peptide provides consistent results from every batch, unlike Annexin V, which can be highly variable between batches.
- **Use With Live Cells:** Easily moves in and out of cells and remains anchored inside cultured apoptotic cells.

Storage Conditions: Store at –20°C protected from light and moisture.

DeadEnd™ Colorimetric TUNEL System

Product	Size	Cat.#
DeadEnd™ Colorimetric TUNEL System	20 reactions	G7360
	40 reactions	G7130

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The DeadEnd™ Colorimetric TUNEL System is a modified TUNEL Assay that provides simple, accurate and rapid detection of apoptotic cells in situ at the single-cell level. The assay measures nuclear DNA fragmentation, an important biochemical indicator of apoptosis, and can be used to detect apoptotic cell death in tissue sections and cultured cells. The fragmented DNA of apoptotic cells is end-labeled using a modified TUNEL (TdT-mediated dUTP Nick-End Labeling) assay. Biotinylated nucleotide is incorporated at the 3´-OH DNA ends using Terminal Deoxynucleotidyl Transferase (TdT). Horseradish-peroxidase-labeled streptavidin (Streptavidin HRP) is then bound to these biotinylated nucleotides, which are detected using the peroxidase substrate, hydrogen peroxide, and the stable chromogen, diaminobenzidine (DAB). Using this procedure, apoptotic nuclei are stained dark brown.

Note: The protocol for the DeadEnd™ TUNEL Assay recommends an optional DNase I treatment of samples as a positive control to detect DNA fragmentation. RQ1 RNase-Free DNase (Cat.# M6101) can be used to generate the positive control and is available separately.

Features:

- **Assay Cells or Tissue:** Detect apoptosis in thick tissue sections or assess cell morphology.
- **Simplify:** Includes DAB substrate and H_2O_2 for color detection and plastic coverslips that simplify sample handling.
- **Proven Applications:** Vibratome® sections of neuronal tissue, Jurkat cells, HL-60 cells.

Storage Conditions: Store the Equilibration Buffer, TdT Enzyme, Biotinylated Nucleotide Mix and Proteinase K at –20°C. Store the Streptavidin HRP, DAB 20X Chromogen, DAB Substrate 20X Buffer and Hydrogen Peroxide 20X at 4°C. Store the SSC 20X and Plastic Coverslips at room temperature.

DeadEnd™ Fluorometric TUNEL System

Product	Size	Cat.#
DeadEnd™ Fluorometric TUNEL System	60 reactions	G3250

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The DeadEnd™ Fluorometric TUNEL System is a classic TUNEL Assay designed for the specific detection and quantitation of apoptotic cells within a cell population. This system measures nuclear DNA fragmentation, an important biochemical hallmark of apoptosis in many cell types, providing simple, accurate and rapid detection of apoptotic cells in situ at the single-cell level or in cell suspensions. The DeadEnd™ Fluorometric TUNEL System measures the fragmented DNA of apoptotic cells by catalytically incorporating fluorescein-12-dUTP at 3´-OH DNA ends using Terminal Deoxynucleotidyl Transferase (TdT), which forms a polymeric tail using the principle of the TUNEL (TdT-mediated dUTP Nick-End Labeling) assay. The fluorescein-12-dUTP-labeled DNA can then be visualized directly by fluorescence microscopy or quantitated by flow cytometry.

Note: The protocol for the DeadEnd™ TUNEL Assay recommends an optional DNase I treatment of samples as a positive control to detect DNA fragmentation. RQ1 RNase-Free DNase (Cat.# M6101) can be used to generate the positive control and is available separately.

Features:

- **Save Money:** System provides sufficient reagents for 60 assays of 50µl each.
- **Save Time:** Direct incorporation of fluorescent nucleotide reduces number of incubation steps.
- **Choose Sample Type:** Use to detect apoptosis in cultured cells and formalin-fixed, paraffin-embedded tissue sections.
- **Convenient:** Plastic coverslips provided simplify sample handling.

Storage Conditions: Store at –20°C. Store the Nucleotide Mix protected from light at –20°C.

Caspase Inhibitor Z-VAD-FMK

Product	Size	Cat.#
Caspase Inhibitor Z-VAD-FMK, 20mM	50 µl	G7231
	125 µl	G7232

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Z-VAD-FMK (carbobenzoxy-valyl-alanyl-aspartyl-[O-methyl]-fluoromethylketone) is a cell-permeant pan caspase inhibitor that irreversibly binds to the catalytic site of caspase proteases and can inhibit induction of apoptosis. For inhibition of apoptosis, Z-VAD-FMK should be added at the same time that apoptosis is induced. Z-VAD-FMK is provided at 20mM in DMSO for convenient addition to cell culture or extracts. The peptide is O-methylated in the P1 position on aspartic acid, providing enhanced stability and increased cell permeability. The suggested concentration for use in the anti-Fas mAb-treated Jurkat cell culture model system is 20µM.

Storage Conditions: Store at –20°C protected from light and moisture.

Available in the Helix® on-site stocking system
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Anti-ACTIVE® Caspase-3 pAb

Product	Size	Cat.#
Anti-ACTIVE® Caspase-3 pAb	50 µl	G7481
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Anti-ACTIVE® Caspase-3 pAb is intended for use as a marker of apoptosis; it specifically stains apoptotic cells without staining nonapoptotic cells. Includes sufficient antibody to perform 125 immunocytochemical assays (100µl/assay) at a 1:250 dilution.

Features:

- **Immunogen:** Peptide derived from the p17 fragment of caspase-3 and having sequence homology in human, mouse, rat and hamster.
- **Antibody Form:** Affinity-purified rabbit IgG; supplied in Dulbecco's PBS.
- **Specificity:** Specifically recognizes the cleaved active form of caspase-3 in human, rat and mouse.

Storage Conditions: store at–20°C.

Anti-PARP p85 Fragment pAb

Product	Size	Cat.#
Anti-PARP p85 Fragment pAb	50 µl	G7341
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Poly (ADP-ribose) polymerase (PARP), a nuclear enzyme involved in DNA repair, is a well known substrate for caspase-3 cleavage during apoptosis. Anti-PARP p85 Fragment pAb is a rabbit polyclonal antibody specific for the p85 fragment of PARP that results from caspase cleavage of the 116kDa intact molecule and thus provides an in situ marker for apoptosis. The antibody is affinity-purified using a peptide that corresponds to a region of the p85 fragment of PARP. The PARP immunogen is a synthetic peptide, gly-val-asp-glu-val-ala-lys (GVDEVAK), representing the N terminus of the large C-terminal fragment of human PARP that results from caspase-3 cleavage. Each batch of antibody is quality assurance tested for use in immunostaining applications and contains sufficient antibody for 50 immunocytochemical reactions at the suggested working dilution of 1:100.

Features:

- **Immunogen:** N-terminal peptide from p85 fragment.
- **Antibody Form:** Affinity-purified rabbit polyclonal antibody provided in Dulbecco's PBS.
- **Specificity:** Specifically detects PARP p85 fragment in human, rat and bovine cells and tissues. Does not recognize the 116kDa intact PARP protein.

Storage Conditions: Store at –20°C.

Autophagy Detection

Autophagy Assay

Product	Size	Cat.#
HEK293 Autophagy LC3 HiBiT Reporter Cell Line and Detection System	1 each	GA1040
U2OS Autophagy LC3 HiBiT Reporter Cell Line and Detection System	1 each	GA1050
Autophagy LC3 HiBiT Reporter Vector and Detection System	1 each	GA2550
Not for Medical Diagnostic Use.		

Description: The Autophagy LC3 HiBiT Reporter Assay System is a plate-based assay using a luminescent LC3 reporter to quantitatively measure autophagic flux. The easy one-step protocol eliminates wash steps and the need for complex imaging or flow cytometry systems. Choose from one of two prepared reporter cell lines (HEK293 or U2OS) or stably transfect the reporter vector into the cell line of your choice.

Features:

- Quantitative, unambiguous LC3 reporter assay
- Easy add-mix-measure protocol
- Scalable for high-throughput applications

Storage Conditions: Upon arrival, immediately transfer cell vials to at or below –140°C (freezer or liquid nitrogen vapor phase) for long-term storage. Do not store cell vials submerged in liquid nitrogen. Do not store cell vials at –80°C because this will negatively impact cell viability and cell performance. Store the Nano-Glo® HiBiT Lytic Detection System at –30°C to –10°C. The Nano-Glo® HiBiT Lytic Buffer may be stored at 4°C for 1 year or at room temperature for 3 months. Store the Autophagy LC3 HiBiT Reporter Vector at –30°C to –10°C.

Cell Viability Assays

RealTime-Glo™ MT Cell Viability Assay

Product	Size	Cat.#
RealTime-Glo™ MT Cell Viability Assay	100 reactions	G9711
	10 × 100 reactions	G9712
	1,000 reactions	G9713

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The RealTime-Glo™ MT Cell Viability Assay is a nonlytic, homogeneous, bioluminescent method to determine in real time the number of viable cells in culture by measuring the reducing potential of cells and thus metabolism (MT). The assay involves adding NanoLuc® luciferase and a cell-permeant pro-NanoLuc® substrate to cells in culture. Viable cells reduce the proprietary pro-substrate to generate a substrate for NanoLuc® luciferase. This substrate diffuses from cells into the surrounding culture medium, where it is rapidly used by the NanoLuc® enzyme to produce a luminescent signal. The signal correlates with the number of viable cells, making the assay well suited for cytotoxicity studies. The reagent is stable and nontoxic to cells for up to 72 hours. No cell washing, removal of medium or further reagent addition is required to determine the number of viable cells. The nonlytic nature of this assay enables cells to be monitored over time in the same well, which reduces the amount of cells used and cell culture costs, and in downstream applications, including assay multiplexing and nucleic acid analysis.

Features:

- **Real-Time Cell Viability Measurements:** Monitor cell viability in real time to determine onset of toxicity, analyze potency versus efficacy over time and analyze differential cell growth with a simple, plate-based protocol.
- **Superior Sensitivity:** The bioluminescent assay provides a greater signal-to-background ratio and higher sensitivity in less time compared to colorimetric or fluorometric viability assays that are based on the reducing potential of cells.
- **Assay Setup Flexibility:** Perform real-time measurements by adding reagents when cells are plated, when test compound is added to the cells or at any time point when cell viability measurements are needed. Alternatively, set up the assay for an endpoint cell viability determination.
- **Nonlytic Assay Format:** The RealTime-Glo™ MT Cell Viability Assay does not require cell lysis. Use cells to multiplex with other luminescent or fluorescent assays without the need for special filters or use cells later in a variety of downstream applications. This means you will use less sample and obtain more informative data points per sample.
- **Well Established Marker of Cell Viability:** The assay chemistry is based on the reducing potential of the cell, which is a trusted metabolic marker of cell viability.
- **Compatibility with Automation:** The assay is compatible with automated and high-throughput protocols. Reactions are scalable and can be performed at low volumes in 96-, 384- and 1,536-well plates.

Storage Conditions: Store the RealTime-Glo™ MT Cell Viability Assay reagents at –20°C, protected from light. Avoid prolonged exposure to light of the MT Cell Viability Substrate, 1,000X. Avoid multiple freeze-thaw cycles. See product label for expiration date.

CellTiter-Glo® 2.0 Assay

Product	Size	Cat.#
CellTiter-Glo® 2.0 Assay	10 ml	G9241
	100 ml	G9242
	500 ml	G9243

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The CellTiter-Glo® 2.0 Assay provides a homogeneous method for determining the number of viable cells in culture by measuring the amount of ATP present, which indicates the presence of metabolically active cells. The CellTiter-Glo® 2.0 Assay is based on the original CellTiter-Glo® Assay chemistry but with improved storage convenience for easy implementation. The CellTiter-Glo® 2.0 Assay is provided as a single, ready-to-use reagent that can be stored at 4°C for up to 5 months with >90% activity remaining or at room temperature for 1 week with >85% activity remaining. The CellTiter-Glo® 2.0 Assay is designed for use with multiwell plate formats, making it ideal for automated high-throughput screening (HTS), cell proliferation and cytotoxicity assays. The homogeneous assay procedure involves adding the single reagent (CellTiter-Glo® 2.0 Reagent) directly to cells cultured in serum-supplemented medium. Cell washing, removal of medium and multiple pipetting steps are not required. The system detects as few as 15 cells/well in a 384-well format in 10 minutes after adding reagent.

The homogeneous "add-mix-measure" format results in cell lysis and generation of a luminescent signal proportional to the amount of ATP present. The amount of ATP is directly proportional to the number of cells present in culture. The CellTiter-Glo® 2.0 Assay generates a "glow-type" luminescent signal, which has a half-life generally greater than three hours, depending on cell type and medium used. The extended half-life eliminates the need to use reagent injectors and provides flexibility for continuous or batch-mode processing of multiple plates.

Features:

- **Ready-to-Use Reagent:** The single, ready-to-use reagent and convenient storage stability at 4°C or 22°C eliminate reagent thawing and preparation, freeing up resources and time, and allow fast and easy implementation.
- **Improved Storage Stability:** Storage stability at 4°C or room temperature allows the same kit to be used multiple times over several days or weeks while maintaining performance.
- **Robust:** Stable luminescent signal with a half-life >3 hours, depending on cell type and culture medium used, allowing batch processing; delivers excellent Z′-factor values for screening applications.
- **Flexible:** The assay can be used with various multiwell formats (96-well, regular or low-volume 384-well and 1,536-well plates. Reagents are offered in volumes to accommodate low-throughput to high-throughput applications. Data can be recorded by luminometer or CCD camera or other imaging device capable of reading luminescence in multiwell plates.
- **Able to Multiplex:** Can be used with other nonlytic-compatible cell-based assay chemistries from Promega.
- **Simple Protocol:** Uses a simple add-mix-read protocol with just a 10-minute incubation.

Storage Conditions: The CellTiter-Glo® 2.0 Assay is shipped frozen and can be stored at –30°C to –10°C through the expiration date of the reagent. The CellTiter-Glo® 2.0 Reagent can maintain >90% activity upon storage at 4°C for 5 months or >85% activity upon storage at 22–25°C for 7 days. The CellTiter-Glo® 2.0 Reagent can withstand four additional freeze-thaw cycles after the first thaw with no loss of activity when the reagent is stored at –30°C to –10°C.

Available in the Helix® on-site stocking system

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CellTiter-Glo® Luminescent Cell Viability Assay

Product	Size	Cat.#
CellTiter-Glo® Luminescent Cell Viability Assay	10 ml	G7570
	10 × 10 ml	G7571
	100 ml	G7572
	10 × 100 ml	G7573

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The CellTiter-Glo® Luminescent Cell Viability Assay is a homogeneous method of determining the number of viable cells in culture based on quantitation of the ATP present, an indicator of metabolically active cells. The CellTiter-Glo® Assay is designed for use with multiwell formats, making it ideal for automated high-throughput screening (HTS), cell proliferation and cytotoxicity assays. The homogeneous assay procedure involves adding the single reagent (CellTiter-Glo® Reagent) directly to cells cultured in serum-supplemented medium. Cell washing, removal of medium and multiple pipetting steps are not required. The system detects as few as 15 cells/well in a 384-well format in 10 minutes after adding reagent and mixing.

The homogeneous "add-mix-measure" format results in cell lysis and generation of a luminescent signal proportional to the amount of ATP present. The amount of ATP is directly proportional to the number of cells present in culture. The CellTiter-Glo® Assay generates a "glow-type" luminescent signal, which has a half-life generally greater than five hours, depending on cell type and medium used. The extended half-life eliminates the need to use reagent injectors and provides flexibility for continuous or batch mode processing of multiple plates. The unique homogeneous format avoids errors that may be introduced by other ATP measurement methods that require multiple steps.

Features:

- **Simplify Cell Viability Assays:** Homogeneous "add-mix-measure" format dramatically reduces the number of plate handling steps required for similar assays.
- **Use Fewer Cells:** Detects as few as 15 cells/well in a 384-well format or 50 cells/well in a 96-well format. Accurately measures cells at numbers below the detection limits of standard colorimetric and fluorometric assays. Reduces the number of cells required per assay.
- **Get Results Quickly:** Data can be recorded 10 minutes after adding reagent.
- **Choose Your Format:** Can be used with various multiwell formats. Data can be recorded by luminometer or CCD camera imaging device.
- **Process Plates Consecutively:** Luminescent signal is very stable, with a half-life generally >5 hours, dependent on cell type and medium used, allowing batch processing; delivers excellent Z′-factor values for screening applications.
- **Get More Information:** Multiplex with other cell-based assays from Promega.
- **Automate This Assay:** Validated automated methods available at: **www.promega.com/automethods/**
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: For long-term storage, the lyophilized CellTiter-Glo® Substrate and CellTiter-Glo® Buffer should be stored at –20°C. Reconstituted CellTiter-Glo® Reagent can be stored at 4°C for 48 hours with ~5% loss of activity or at 4°C for 4 days with ~20% loss of activity.

CellTiter-Glo® One Solution Assay

Product	Size	Cat.#
CellTiter-Glo® One Solution Assay	100 ml	G8461
	500 ml	G8462

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The CellTiter-Glo® One Solution Assay is a homogeneous method of determining the number of viable cells in culture based on quantitation of the ATP present, which indicates the presence of metabolically active cells. This frozen, ready-to-use format is based on the original CellTiter-Glo® Luminescence Cell Viability Assay chemistry and eliminates the need to combine buffer with lyophilized substrate when preparing reagent. The CellTiter-Glo® Assay is designed for use with multiwell-plate formats, making it ideal for automated high-throughput screening (HTS) in 96- to 1536-well format, and cell proliferation and cytotoxicity assays.

The homogeneous "add-mix-measure" format results in cell lysis and generation of a luminescent signal proportional to the amount of ATP present. The amount of ATP is directly proportional to the number of cells present in culture. The CellTiter-Glo® One Solution Assay generates a stable "glow-type" luminescent signal with a half-life of greater than three hours. This extended half-life eliminates the need for reagent injectors and provides flexibility for continuous or batch-mode processing of multiple plates.

Features:

- **Convenient:** No reagent preparation is required; simply thaw and "add-mix-measure". Volumes convenient for HTS applications.
- **Homogeneous:** "Add-mix-measure" format reduces the number of plate-handling steps.
- **Fast:** Data can be recorded 10 minutes after reagent addition.
- **Sensitive:** Measures cells at numbers below the detection limits of standard colorimetric and fluorometric assays.
- **Flexible:** Can be used with various multiwell formats (96-, regular or low-volume 384- and 1536-well plates). Data can be recorded by luminometer or CCD camera imaging device.
- **Robust:** Stable luminescent signal with a half-life >3 hours, depending on cell type and culture medium used.
- **Ability to Multiplex:** Can be used with other nonlytic compatible assay chemistries from Promega.

Storage Conditions: Store the CellTiter-Glo® One Solution Assay below –10°C. CellTiter-Glo® One Solution Assay can be stored at 4°C for 48 hours or at 22°C for 10 hours with ~10–12% loss of activity. CellTiter-Glo® One Solution Assay can withstand two additional freeze-thaw cycles after the first thaw, with approximately 10% loss of activity with each additional freeze-thaw cycle.

CellTiter-Glo® 3D Cell Viability Assay

Product	Size	Cat.#
CellTiter-Glo® 3D Cell Viability Assay	10 ml	G9681
	10 × 10 ml	G9682
	100 ml	G9683

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The CellTiter-Glo® 3D Cell Viability Assay is a homogeneous method to determine the number of viable cells in 3D cell culture based on quantitation of the ATP present, which is a marker for the presence of metabolically active cells. This ready-to-use reagent is based on the original CellTiter-Glo® Luminescent Cell Viability Assay chemistry and eliminates the need to combine buffer with lyophilized substrate when preparing reagent. The CellTiter-Glo® 3D Cell Viability Assay is formulated with more robust lytic capacity and is designed for use with microtissues produced in 3D cell culture. The homogeneous assay procedure involves addition of a single reagent (CellTiter-Glo® 3D Reagent) directly to cells cultured in serum-supplemented medium. Cell washing, removal of medium and multiple pipetting steps are not required. This assay is compatible with multiwell-plate formats, making it ideal for automated high-throughput screening (HTS). The CellTiter-Glo® 3D Assay has been used successfully with 3D microtissue cell culture produced via hanging-drop plates, ultra-low attachment plates, Matrigel®-coated plates, agarose-coated plates, cultures suspended in methylcellulose and Alvetex® plates.

Features:

- **Robust Penetration into Microtissues:** Improved lytic capacity allows use over a broad range of microtissue sizes compared to other viability assay methods.
- **Ready-to-Use Reagent:** No mixing of components required; simply thaw, equilibrate to room temperature and "add-mix-incubate-measure". Convenient for HTS applications.
- **Fast Results:** Data can be recorded in 30 minutes or less after adding reagent, quicker than when using colorimetric or fluorometric viability assays.
- **Superior Sensitivity:** The signal-to-background ratio of this assay applied to microtissues is much greater than that of standard colorimetric and fluorometric assays.
- **Flexible Format:** The assay can be used with various multiwell formats (96-well and regular or low-volume 384-well). Data can be recorded by luminometer, CCD camera or other imaging devices capable of reading luminescence in multiwell plates.
- **Glow-Type Signal:** Stable luminescent signal half-life >3 hours, depending on cell type and culture medium used, allows batch mode or consecutive processing of multiple plates.

Storage Conditions: Store at –30 to –10°C until the expiration date on the kit label.

BacTiter-Glo™ Microbial Cell Viability Assay

Product	Size		Cat.#
BacTiter-Glo™ Microbial Cell Viability Assay	10 ml		G8230
	10 × 10 ml		G8231
	100 ml		G8232
	10 × 100 ml		G8233
Available Separately	**Size**	**Conc.**	**Cat.#**
rATP, 10mM	0.5 ml	mM	P1132

G8230, G8231, G8232, G8233 For Research Use Only. Not for Use in Diagnostic Procedures. P1132 For Laboratory Use.

Description: The BacTiter-Glo™ Microbial Cell Viability Assay provides a method for determining the number of viable microbial cells in culture based on quantitation of the ATP present. ATP is an indicator of metabolically active cells. The homogeneous assay procedure involves adding a single reagent (BacTiter-Glo™ Reagent) directly to bacterial cells cultured in medium and measuring luminescence. This assay format reduces pipetting errors that may be introduced during the multiple steps required by other methods of ATP measurement. The formulation of the reagent supports bacterial cell lysis and generation of a luminescent signal in an "add-mix-measure" format. The luminescent signal is proportional to the amount of ATP present, which is directly proportional to the number of viable cells in culture. The assay relies on the properties of a proprietary thermostable luciferase (Ultra-Glo™ Recombinant Luciferase) and a proprietary buffer formulation for extracting ATP from bacteria. The assay has been shown to detect a variety of bacteria and fungi.

Features:

- **Simplify Microbial Detection:** The "add-mix-measure" format reduces the number of handling steps to fewer than that required for similar ATP assays, with no separate lysis step, and no injectors required, allowing easy automation.
- **Get Results Quickly:** Data can be recorded in 5 minutes or less after adding reagent and mixing. Superior sensitivity allows you to detect growth or toxicity quickly after inoculation.
- **Increase Your Sensitivity:** Measure ATP from as few as 10 bacterial cells, 1,000-fold more sensitive than absorbance (O.D.) readings.
- **Choose Your Format:** Can be used with various multiwell-plate or single-use formats. Data can be recorded by luminometer or CCD camera.
- **Process Plates Consecutively:** The "glow-type" luminescent signal is stable, with a half-life generally over 30 minutes.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: For long-term storage, the lyophilized BacTiter-Glo™ Substrate and BacTiter-Glo™ Buffer should be stored at –20°C.

Available in the Helix® on-site stocking system

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Fluorescent Cell Viability Assay

Product	Size	Cat.#
CellTiter-Fluor™ Cell Viability Assay	10 ml	G6080
	5 × 10 ml	G6081
	2 × 50 ml	G6082

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The CellTiter-Fluor™ Cell Viability Assay is a nonlytic, single-reagent-addition fluorescence assay that measures the relative number of viable cells in a population. The assay is based on measurement of a conserved and constitutive protease activity within live cells and therefore serves as a biomarker of cell viability. The live-cell protease activity is restricted to intact viable cells and is measured using a fluorogenic, cell-permeant, peptide substrate (Gly-Phe-AFC). The substrate enters intact cells, where it is cleaved by the live-cell protease activity to generate a fluorescent signal proportional to the number of living cells. The live-cell protease becomes inactive upon loss of membrane integrity and leakage into the surrounding culture medium.

The CellTiter-Fluor™ Assay also can be used in a single-well, sequential, multiplex format with other downstream assay chemistries to normalize data by cell number. Data from the assay can serve as an internal control and allow identification of errors resulting from cell clumping or compound cytotoxicity. The assay is compatible with many Promega luminescence assays or spectrally distinct fluorescence assay methods, such as measuring caspase activation, reporter gene expression or orthogonal measures of viability.

Features:

- **Obtain Better Data from Every Well:** The assay can be performed in multiplex with many Promega luminescence assays or spectrally distinct fluorescence assays.
- **Normalize Data for Cell Number:** Normalizing data for live-cell number makes results more comparable well-to-well, plate-to-plate, day-to-day.
- **Save on Cell Culture Costs:** Multiplexing assays in the same well eliminates parallel plate processing, thus reducing cell culture costs.

Storage Conditions: Store at –20°C.

CellTiter 96® AQ_{ueous} One Solution Cell Proliferation Assay (MTS)

Product	Size	Cat.#
CellTiter 96® AQ_{ueous} One Solution Cell Proliferation Assay	200 assays	G3582
	1,000 assays	G3580
	5,000 assays	G3581

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The CellTiter 96® AQ_{ueous} One Solution Cell Proliferation Assay is a colorimetric method for determining the number of viable cells in proliferation, cytotoxicity or chemosensitivity assays. The CellTiter 96® AQ_{ueous} One Solution Reagent contains a tetrazolium compound [3-(4,5-dimethylthiazol-2-yl)-5-(3-carboxymethoxyphenyl)-2-(4-sulfophenyl)-2H-tetrazolium, inner salt; MTS] and an electron coupling reagent (phenazine ethosulfate; PES). PES has enhanced chemical stability, which allows it to be combined with MTS to form a stable solution. The CellTiter 96® AQ_{ueous} Assay uses phenazine methosulfate (PMS) as the electron coupling reagent, and PMS Solution and MTS Solution are supplied separately. PES has enhanced chemical stability, which allows it to be combined with MTS to form a stable solution.

Assays are performed by adding a small amount of the CellTiter 96® AQ_{ueous} One Solution Reagent directly to culture wells, incubating for 1–4 hours and then recording absorbance at 490nm with a 96-well plate reader. The quantity of formazan product as measured by the amount of 490nm absorbance is directly proportional to the number of living cells in culture.

If you currently use a [^{3}H]-thymidine incorporation assay, addition of the CellTiter 96® AQ_{ueous} One Solution Reagent can be substituted for the pulse of [^{3}H]-thymidine at the time point in the assay when the pulse of radioactive thymidine is usually added. Previous bioassay data comparing [^{3}H]-thymidine incorporation to the MTS-based CellTiter 96® AQ_{ueous} Assay and the original MTT-based CellTiter 96® Assay demonstrate that tetrazolium reagents can be substituted for [^{3}H]-thymidine incorporation.

Features:

- **Simplify Colorimetric Viability Assays:** "Add-incubate-measure" format (single-step reagent addition) enables design of homogeneous high-throughput screening assays.
- **Use a Single Solution:** Use as a single solution, filter sterilized and ready to add to assay plates (unlike MTT).
- **Perform Fewer Steps:** Perform the assay in 96-well plates with no washing or cell harvesting. Also eliminates solubilization steps normally required for MTT assays.
- **Gain Flexibility:** Plates can be read and returned to incubator for further color development (unlike MTT).
- **Avoid Organic Solvents:** Requires no volatile organic solvent to solubilize the formazan product (unlike MTT).
- **Non-Radioactive:** Requires no scintillation cocktail or radioactive waste disposal (unlike [^{3}H]-thymidine incorporation assays).
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –20°C, protected from light.

CellTiter 96® AQueous Non-Radioactive Cell Proliferation Assay (MTS)

Product	Size	Cat.#
CellTiter 96® AQueous Non-Radioactive Cell Proliferation Assay	1,000 assays	G5421
	5,000 assays	G5430
	50,000 assays	G5440
Available Separately		
CellTiter 96® AQueous MTS Reagent Powder	1 g	G1111
	250 mg	G1112

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The CellTiter 96® AQueous Non-Radioactive Cell Proliferation Assay is a homogeneous, colorimetric method for determining the number of viable cells in proliferation, cytotoxicity or chemosensitivity assays. The CellTiter 96® AQueous Assay is composed of solutions of a novel tetrazolium compound [3-(4,5-dimethylthiazol-2-yl)-5-(3-carboxymethoxyphenyl)-2-(4-sulfophenyl)-2H-tetrazolium, inner salt; MTS] and an electron coupling reagent (phenazine methosulfate) PMS. MTS is bioreduced by cells into a formazan product that is soluble in tissue culture medium. The absorbance of the formazan product at 490nm can be measured directly from 96-well assay plates without additional processing. The conversion of MTS into the aqueous soluble formazan product is accomplished by dehydrogenase enzymes found in metabolically active cells. The quantity of formazan product as measured by the amount of 490nm absorbance is directly proportional to the number of living cells in culture.

If you currently use a [^{3}H]-thymidine incorporation assay, addition of the combined MTS/PMS solution can be substituted for [^{3}H]-thymidine at the time point in the assay when the pulse of radioactive thymidine is usually added. Data from proliferation bioassays comparing the CellTiter 96® AQueous Assay and [^{3}H]-thymidine incorporation show similar results. This is in agreement with similar radioactivity incorporation studies performed using the original CellTiter 96® Assay.

CellTiter 96® AQueous MTS Reagent Powder is a novel tetrazolium compound for use in colorimetric assays for determining the number of viable cells in proliferation, cytotoxicity or chemosensitivity assays. It is provided in powdered form.

Features:

- **Easy to Use:** Combine provided MTS and PMS solutions, add to cells, incubate and read absorbance.
- **Fast:** Perform the assay in a 96-well plate with no washing or cell harvesting. Also eliminates solubilization steps because the MTS formazan product is soluble in tissue culture medium.
- **Non-Radioactive:** Requires no scintillation cocktail or radioactive waste disposal (unlike [^{3}H]-thymidine).
- **Flexible:** Plates can be read and returned to incubator for further color development (unlike MTT).
- **Safe:** Requires no volatile organic solvent to solubilize the formazan product (unlike MTT).

Storage Conditions: For long-term storage, store MTS and PMS Solutions at –20°C, protected from light.

CellTiter 96® Non-Radioactive Cell Proliferation Assay (MTT)

Product	Size	Cat.#
CellTiter 96® Non-Radioactive Cell Proliferation Assay	1,000 assays	G4000
	5,000 assays	G4100

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The CellTiter 96® Assay is a collection of qualified reagents that provide a convenient method of determining viable cell number. The CellTiter 96® Assay is a modification of the MTT assay method described by Mosmann and incorporates several improvements to the method that address previous technical problems including: 1) serum protein precipitation caused by adding organic solvent; 2) interference by phenol red; 3) incomplete solubilization of the formazan crystals resulting in lower sensitivity; and 4) stability of the colored product.

The CellTiter 96® Assay is performed by adding a premixed, optimized Dye Solution to culture wells of a 96-well plate, usually containing various concentrations of growth factor or test substance. During a 4-hour incubation, living cells convert the MTT tetrazolium component of the Dye Solution into a formazan product. If you currently use a [^{3}H]-thymidine incorporation assay, the addition of Dye Solution can be substituted for the pulse of radioactive thymidine at the time point in the assay when the pulse of [^{3}H]-thymidine is usually added. The Solubilization/Stop Solution is then added to the culture wells to solubilize the formazan product, and the absorbance at 570nm is recorded using a 96-well plate reader. In addition, direct comparison between [^{3}H]-thymidine incorporation and tetrazolium conversion have demonstrated less than a 5% difference between the two assays for determination of growth factor content of several samples.

Features:

- **Gain Sensitivity:** Detect as few as 1,000 cells/well with a 96-well plate reader. Greater sensitivity than the neutral red assay procedure.
- **Use a Variety of Cells:** Assay mammalian, plant and yeast cells.
- **Non-Radioactive:** Requires no scintillation cocktail or radioactive waste disposal.
- **Save Time:** Perform the assay in a 96-well plate with no washing steps, no cell harvesting and no scintillation counting.
- **Adapt to Your Needs:** Follow either a 4-hour or overnight protocol.
- **Convenient:** Requires no weighing or mixing of dye components.

Storage Conditions: Store Dye Solution at –20°C and Solubilization/Stop Solution at room temperature.

Available in the Helix® on-site stocking system

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CellTiter-Blue® Cell Viability Assay

Product	Size	Cat.#
CellTiter-Blue® Cell Viability Assay	20 ml	G8080
	100 ml	G8081
	10 × 100 ml	G8082

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The CellTiter-Blue® Cell Viability Assay provides a homogeneous, fluorescent method for monitoring cell viability. The assay is based on the ability of living cells to convert a redox dye (resazurin) into a fluorescent end product (resorufin). Nonviable cells rapidly lose metabolic capacity and thus do not generate a fluorescent signal. The homogeneous assay procedure involves adding the single reagent directly to cells cultured in serum-supplemented medium. After an incubation step, data are recorded using either a plate-reading fluorometer (preferred) or spectrophotometer.

Features:

- **Save Time:** The homogeneous, add-incubate-measure format reduces the number of handling steps.
- **Perform More Than One Assay on the Same Sample:** The system can be multiplexed with other assay methods such as the Apo-ONE® Homogeneous Caspase-3/7 Assay (Cat.# G7790) or the Caspase-Glo® Assays (Cat.# G8090, G8200, G8210) for detecting apoptosis.
- **Gain Flexibility:** The CellTiter-Blue® Assay has an excellent Z′ factor and offers more flexibility in assay incubation times compared to other resazurin-based assays.
- **Safe:** The reagent is generally nontoxic to cells, allowing extended incubation periods in some situations. Requires no scintillation cocktail, radioactive waste disposal (unlike [^{3}H]-thymidine incorporation assays) or hazardous solvents (as required for MTT tetrazolium-based assays).
- **Adapt to Your Throughput Needs:** The reagent is designed to provide sufficient volumes for accurate pipetting into 96- or 384-well formats. Convenient product sizes available for high-throughput screening.
- **Automate This Assay:** Validated automated methods available at: **www.promega.com/automethods/**
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store frozen at –20°C protected from light.

Viral ToxGlo™ Assay

Product	Size	Cat.#
Viral ToxGlo™ Assay	10 ml	G8941
	10 × 10 ml	G8942
	100 ml	G8943

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Viral ToxGlo™ Assay is a simple, quantifiable method of determining viral-induced cytopathic effects (CPE) in host cells caused by lytic virions. The assay measures cellular ATP as a surrogate measure of host cell viability. When CPE occurs due to viral infection, ATP depletion can be measured and correlated with viral burden. The amount of ATP detected is directly proportional to the number of viable host cells in culture and can be used as a simple method to quantify viral-induced CPE. The homogeneous "add-mix-measure" assay procedure involves adding the single reagent (ATP Detection Reagent) directly to host cells following viral treatment. A "glow-type" luminescent signal is generated that is proportional to the amount of ATP present. Cell washing, multiple pipetting steps and visual assessment are not required to assess CPE. The system detects as few as 15 cells/well in a 384-well format in 10 minutes after reagent addition and mixing and is designed for use in multiwell formats, making it ideal for automated high-throughput screening (HTS).

Features:

- **Objectively Quantify CPE:** The assay provides quantifiable data by luminescence detection, which obviates subjective operator error associated with visual scoring methods.
- **Decrease Time to Results:** Data can be recorded and analysis begun 10 minutes after reagent addition.
- **Simplify Assessment of CPE:** The homogeneous "add-mix-measure" protocol dramatically reduces the manual steps required for CPE assessment.
- **Choose Your Format:** The reagent is scalable from 96- to 1536-well plate formats.
- **Amenable to High Throughput Screening:** Luminescent signal is very stable with a half-life generally >5 hours dependent on cell type and medium used, allowing batch or consecutive processing. No fluorescence interference results in high signal to background and delivers excellent Z′ values in screening applications.
- **Choose Your Reagent Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: For long-term storage, the lyophilized ATP Detection Substrate and ATP Detection Buffer should be stored at –30°C to –10°C.

LDH-Glo™ Cytotoxicity Assay

Product	Size	Cat.#
LDH-Glo™ Cytotoxicity Assay	10ml	J2380
	50ml	J2381

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The LDH-Glo™ Cytotoxicity Assay is a bioluminescent plate-based assay for quantifying lactate dehydrogenase (LDH) release into the culture medium upon plasma membrane damage. The bioluminescent detection is more sensitive than colorimetric or fluorescent methods, allowing accurate detection of LDH from a small number of cells, including primary cells and 3D cell cultures.

The assay involves removing only a small amount of cell media (2–5µl) from each treated well, allowing you to get more data by sampling the same well over time, and by using the remaining media and cells for other cell-based assays.

Features:

- Detects LDH release from small numbers of cells, including 3D cell models
- Monitors cytotoxicity from the same sample over time
- Provides more data per well through multiplexing with other cell-based assays

Storage Conditions: Store complete kits below –65°C. Alternatively, store the Reductase Substrate below –65°C protected from light, and store all other components at –30°C to –10°C.

MultiTox-Glo Multiplex Cytotoxicity Assay

Product	Size	Cat.#
MultiTox-Glo Multiplex Cytotoxicity Assay	10 ml	G9270
	5 × 10 ml	G9271
	2 × 50 ml	G9272

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The MultiTox-Glo Multiplex Cytotoxicity Assay is a sequential-reagent-addition fluorescent and luminescent assay that measures the relative number of live and dead cells in cell populations. The MultiTox-Glo Assay sequentially measures two protease activities; one is a marker of viability, and the other is a marker of cytotoxicity. The live-cell protease activity is restricted to intact viable cells and is measured using a fluorogenic, cell-permeant, peptide substrate (GF-AFC). This substrate enters intact cells, where it is cleaved by the live cell protease activity to release AFC and generate a fluorescent signal that is proportional to the number of viable cells. The live-cell protease becomes inactive upon loss of membrane integrity and leakage into the surrounding culture medium. A second, luminogenic cell-impermeant peptide substrate (AAF-aminoluciferin) is used to measure dead-cell protease activity, which is released from cells that have lost membrane integrity. The liberated aminoluciferin product is measured as "glow type" luminescence generated by Ultra-Glo™ Recombinant Luciferase provided in the assay reagent.

The MultiTox-Glo Assay gives ratiometric, inversely correlated measures of cell viability and cytotoxicity, which correlate with established methods for measuring viability and cytotoxicity. The ratio of viable cells to dead cells is independent of cell number and, therefore, can be used to normalize data. Having complementary cell viability and cytotoxicity measures reduces errors associated with pipetting and cell clumping, as well as serving as an internal control to allow identification of errors resulting from chemical interference from test compounds or media components.

Features:

- **Measure the Number of Live Cells and Dead Cells in Culture:** Sequential-reagent-addition assay with a homogeneous "add-mix-measure" protocol.
- **Normalize Data with a Built-In Internal Control:** The ratio of the number of live cells/number of dead cells is independent of cell number and can be used to normalize data. This normalization makes results more comparable well-to-well, plate-to-plate and day-to-day.
- **Immediately Identify More False-Positives and False-Negatives:** Independent cell viability and cytotoxicity measurements serve as controls for each other. If test compounds interfere with one assay chemistry, the other serves as an internal control.
- **Improve your Data:** Reduce statistical probability of false-positives (or false-negatives), and eliminate fluorescence interference issues by luminescence readout.

Storage Conditions: Store at –20°C, protected from light.

MultiTox-Fluor Multiplex Cytotoxicity Assay

Product	Size	Cat.#
MultiTox-Fluor Multiplex Cytotoxicity Assay	10 ml	G9200
	5 × 10 ml	G9201
	2 × 50 ml	G9202

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The MultiTox-Fluor Multiplex Cytotoxicity Assay is a single-reagent-addition, homogeneous, fluorescent assay that measures the number of live and dead cells simultaneously in culture wells. The assay simultaneously measures cell viability and cytotoxicity by detecting two distinct protease activities. The live-cell protease activity is restricted to intact viable cells and is measured using a fluorogenic, cell-permeant peptide substrate (GF-AFC Substrate). The substrate enters intact cells where it is cleaved to generate a fluorescent signal proportional to the number of living cells. This live-cell protease activity marker becomes inactive upon loss of membrane integrity and leakage into the surrounding culture medium. A second, cell-impermeant, fluorogenic peptide substrate (bis-AAF-R110 Substrate) is used to measure dead-cell protease activity that has been released from cells that have lost membrane integrity.

Features:

- **Measure the Number of Live and Dead Cells in Culture:** Homogeneous, "add-mix-measure" protocol eliminates parallel plate processing and reduces cell culture costs.
- **Normalize Data for Cell Number:** The ratio of live:dead cells is independent of cell number and normalizes data. Data normalization for cell number makes results more comparable well-to-well, plate-to-plate, day-to-day.
- **Reduce False-Positive and -Negative Results:** Complementary live- and dead-cell measures with independent chemistries serve as internal controls for each other.
- **Get More Data from Every Well:** Multiplex the MultiTox-Fluor Assay with most Promega bioluminescent cell-based apoptosis or genetic reporter assays.
- **Reduce Assay Variability:** The homogeneous "add-mix-measure" protocol avoids the cumulative error associated with multistep protocols.

Storage Conditions: Store at –20°C.

ApoTox-Glo™ Triplex Assay

Product	Size	Cat.#
ApoTox-Glo™ Triplex Assay	10 ml	G6320
	5 × 10 ml	G6321

For Research Use Only. Not for Use in Diagnostic Procedures.

For additional information see page 13.

CellTox™ Green Cytotoxicity Assay

Product	Size	Cat.#
CellTox™ Green Cytotoxicity Assay	10 ml	G8741
	50 ml	G8742
	100 ml	G8743
CellTox™ Green Express Cytotoxicity Assay	200 µl	G8731

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The CellTox™ Green Cytotoxicity Assay measures changes in membrane integrity that occur as a result of cell death. The assay is intended to assess cytotoxicity in cell culture after experimental manipulation. The assay system uses a proprietary asymmetric cyanine dye that is excluded from viable cells but preferentially stains the DNA from dead cells. When the dye binds DNA released from cells, its fluorescence properties are substantially enhanced. Viable cells produce no appreciable increases in fluorescence. Therefore, the fluorescence signal produced by the binding interaction with dead-cell DNA is proportional to cytotoxicity. The CellTox™ Green Dye is nontoxic to cells, and the signal remains constant after exposure of 72 hours, making it ideal for determining toxic effects of treatments throughout an extended exposure or as an endpoint determination.

Features:

- **Accurate Cytotoxicity Determination:** The CellTox™ Green Dye stably binds DNA of cells that have lost membrane integrity throughout a 72-hour exposure and won't underestimate cytotoxicity.
- **Kinetic Cytotoxicity Measures:** Measure cytotoxicity at convenient time points from the same sample well to detect onset of toxicity with no duplication of plates.
- **Simple and Flexible Protocols:** Add assay reagent directly to cells prior to plating or with dosing media to perform kinetic cytotoxicity measurements, eliminating a reagent dispensing step, or add diluted dye directly to cell culture wells as an endpoint add-mix-measure assay.
- **Multiplexing-Compatible:** Get more informative data per well and reduce cell culture expenses by multiplexing with fluorescent and luminescent cell-based assays in the same well with no sample manipulation.
- **Easily Automated:** Easily scale from 96- to 1536-well plate formats with "no-addition" or "single-addition" protocols.

Storage Conditions: Store at –20°C.

Lysis Solution

Product	Size	Cat.#
Lysis Solution	5 ml	G1821

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Lysis Solution is a detergent solution useful for lysing cells and creating a cytotoxicity positive control.

Storage Conditions: Store at –20°C.

CytoTox-Glo™ Cytotoxicity Assay

Product	Size	Cat.#
CytoTox-Glo™ Cytotoxicity Assay	10 ml	G9290
	5 × 10 ml	G9291
	2 × 50 ml	G9292

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The CytoTox-Glo™ Assay is a luminescent cytotoxicity assay that measures the relative number of dead cells in cell populations. The CytoTox-Glo™ Assay measures the extracellular activity of a distinct intracellular protease activity (dead-cell protease) when the protease is released from membrane-compromised cells. A luminogenic cell-impermeant peptide substrate (AAF-aminoluciferin) is used to measure dead-cell protease activity. The liberated aminoluciferin product is measured as "glow type" luminescence generated by Ultra-Glo™ Recombinant Luciferase provided in the assay reagent. The AAF-aminoluciferin substrate cannot cross the intact membrane of viable cells and does not generate any appreciable signal from the live-cell population. The amount of luminescence directly correlates with the percentage of cells undergoing cytotoxic stress. With the addition of a lysis reagent (provided), the CytoTox-Glo™ Assay also can deliver the luminescent signal associated with the total number of cells in each assay well. Viability can be calculated by subtracting the luminescent dead-cell signal from the total luminescent value, thus allowing you to normalize assay data to cell number and mitigate assay interferences that may lead to erroneous conclusions. The cytotoxicity protease biomarker is constitutive and conserved across cell lines, and the CytoTox-Glo™ Assay demonstrates excellent correlation with other methods of assessing cell viability.

Features:

- **Measure the Relative Number of Dead Cells in Culture:** Measure cytotoxicity by adding a single reagent with the homogeneous "add-mix-measure" protocol.
- **Distinguish Between Small Differences in Viability:** The assay provides a linear response and can distinguish between small differences in viability across the entire spectrum of cytotoxicity, from modest cytotoxicity (100 to 95% viability) to profound cytotoxicity (5 to 0% viability).
- **Normalize Data for Cytotoxicity:** Data normalization for dead-cell number makes results more comparable well-to-well, plate-to-plate and day-to-day.
- **Measure the Relative Number of Remaining Viable Cells Using a Total Lysis Protocol:** Correlate increased cytotoxicity with a reduction in viable cells.
- **Improve your Data:** Reduce statistical probability of false-positives (or false-negatives), and eliminate fluorescence interference issues with a stable luminescence readout.

Storage Conditions: Store at –20°C, protected from light.

CytoTox-Fluor™ Cytotoxicity Assay

Product	Size	Cat.#
CytoTox-Fluor™ Cytotoxicity Assay	10 ml	G9260
	5 × 10 ml	G9261
	2 × 50 ml	G9262

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The CytoTox-Fluor™ Cytotoxicity Assay is a single-reagent-addition, homogeneous, fluorescent assay that measures the relative number of dead cells in cell populations. The assay measures a distinct protease activity associated with cytotoxicity and uses a fluorogenic peptide substrate (bis-alanyl-alanyl-phenylanlanyl-rhodamine 110; bis-AAF-R110) to measure "dead-cell activity," which has been released from cells that have lost membrane integrity. The bis-AAF-R110 substrate cannot cross the intact membrane of live cells and therefore gives no signal from live cells. The assay is designed to accommodate downstream multiplexing with several Promega luminescent assays or spectrally distinct fluorescent assay methods, such as assays to measure caspase activation, reporter gene expression or orthogonal measures of viability.

Features:

- **Measure the Relative Number of Dead Cells in Culture:** Homogeneous, "add-mix-measure" protocol eliminates parallel plate processing and reduces cell culture costs.
- **Get More Data from Every Well:** Multiplex the CytoTox-Fluor™ Assay with several Promega luminescent cell-based assays.
- **Normalize Downstream Multiplex Data for Cytotoxicity:** Data normalization for dead-cell number makes results more comparable well-to-well, plate-to-plate, day-to-day.
- **Reduce Assay Variability:** The homogeneous "add-mix-measure" protocol avoids the cumulative error associated with multistep protocols.

Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system

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CytoTox-ONE™ Homogeneous Membrane Integrity Assay

Product	Size	Cat.#
CytoTox-ONE™ Homogeneous Membrane Integrity Assay	200–800 assays	G7890
	1,000–4,000 assays	G7891
CytoTox-ONE™ Homogeneous Membrane Integrity Assay, HTP	1,000–4,000 assays	G7892

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The CytoTox-ONE™ Homogeneous Membrane Integrity Assay is a fluorometric method for estimating the number of nonviable cells present in multiwell plates. The CytoTox-ONE™ Assay rapidly measures the release of lactate dehydrogenase (LDH) from cells with a damaged membrane. LDH released into the culture medium is measured with a 10-minute coupled enzymatic assay that results in the conversion of resazurin into a fluorescent resorufin product. The amount of fluorescence produced is proportional to the number of lysed cells using a 96- or 384-well format. The CytoTox-ONE™ Reagent does not damage normal healthy cells; therefore the reactions to measure released LDH can be performed directly in a homogeneous format in assay wells containing a mixed population of viable and damaged cells.

The CytoTox-ONE™ Homogeneous Membrane Integrity Assay, HTP (Cat.# G7892), offers convenient, alternative packaging for processing multiple plates. Each bottle of reagent supplied with the system is sufficient to perform 500 assays in a 96-well format or 2,000 assays in a 384-well format when the recommended volumes are used.

Features:

- **Save Time:** Complete the assay in the cell culture plate, eliminating the sample transfer step common in many LDH assays; the plates are incubated for 10 minutes before reading data, compared to 30 minutes or more with classic LDH assays.
- **Multiplex This Assay:** Perform multiple assays on one sample with other homogeneous cell-based assays from Promega.
- **Adapt Protocol to Your Needs:** Completed assays can be read over several hours after the provided stop solution has been added while still maintaining good signal.
- **Automate This Assay:** Validated automated methods available at: **www.promega.com/automethods/**
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –20°C protected from light.

CytoTox 96® Non-Radioactive Cytotoxicity Assay

Product	Size	Cat.#
CytoTox 96® Non-Radioactive Cytotoxicity Assay	1,000 assays	G1780

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The CytoTox 96® Non-Radioactive Cytotoxicity Assay is a colorimetric alternative to radioactive cytotoxicity assays. The CytoTox 96® Assay quantitatively measures lactate dehydrogenase (LDH), a stable cytosolic enzyme that is released upon cell lysis, in much the same way as [^{51}Cr] is released in radioactive assays. Released LDH in culture supernatants is measured with a 30-minute coupled enzymatic assay that results in the conversion of a tetrazolium salt (INT) into a red formazan product. The amount of color formed is proportional to the number of lysed cells. Visible wavelength absorbance data are collected using a standard 96-well plate reader. The assay can be used to measure membrane integrity for cell-mediated cytotoxicity assays in which a target cell is lysed by an effector cell, or to measure lysis of target cells by bacteria, viruses, proteins, chemicals, etc.

Features:

- **Non-Radioactive:** Requires no radioactive waste disposal or [^{51}Cr].
- **Save Time:** Eliminates labeling of target cells prior to experiment.
- **Use Standard Equipment:** Collect absorbance (visible wavelength) data with a standard 96-well plate reader.
- **Adapt to Your Needs:** Used for a variety of applications including measurement of: 1) cell-mediated cytotoxicity; 2) chemical-mediated cytotoxicity; and 3) total cell number.
- **Gain Sensitivity:** Can reveal early, low-level damage to cell membranes that is often missed with other methodologies.

Storage Conditions: Store Substrate Mix and Assay Buffer at –20°C. Store LDH Positive Control, Lysis Solution (10X) and Stop Solution at 4°C.

Digitonin

Product	Size Conc.	Cat.#
Digitonin	40 µl 20 mg/ml in DMSO	G9441

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Digitonin is a detergent solution useful for permeabilizing cells and for creating a cytotoxicity chemistry positive control.

Storage Conditions: Store at –20°C protected from light.

ADCC Bioassays

Product	Size	Cat.#
ADCC Reporter Bioassay, Complete (Raji)	1 each	G7015
ADCC Reporter Bioassay, Complete (WIL2-S)	1 each	G7014
ADCC Reporter Bioassay, Core Kit	1 each	G7010
ADCC Reporter Bioassay, Target (Raji)	1 each	G7016
ADCC Reporter Bioassay, Target (WIL2-S)	1 each	G7013
ADCC Reporter Bioassay, Core Kit 5X	1 each	G7018
ADCC Bioassay Effector Cells, Propagation Model	1 each	G7102
ADCC Reporter Bioassay, F Variant, Core Kit	1 each	G9790
ADCC Reporter Bioassay, F Variant, Core Kit 5X	1 each	G9798
ADCC Bioassay Effector Cells, F Variant, Propagation Model	1 each	G9302

G7015, G7014, G7010, G7016, G7013, G7018 For Research Use Only. Not for Use in Diagnostic Procedures. G7102, G9790, G9798, G9302 Not For Medical Diagnostic Use. All products not available in all countries.

For additional information see page 236.

Inflammation Assay

Caspase-Glo® 1 Inflammasome Assay

Product	Size	Cat.#
Caspase-Glo® 1 Inflammasome Assay	10 ml	G9951
	5 × 10 ml	G9952
	100 ml	G9953

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Caspase-Glo® 1 Inflammasome Assay is a homogeneous, bioluminescent method to selectively measure the activity of caspase-1, a member of the cysteine aspartic acid-specific protease (caspase) family and an essential component of the inflammasome. Inflammasomes are protein complexes induced by diverse inflammatory stimuli. Innate immune cells respond to pathogens and other danger signals with inflammasome formation and conversion of procaspase-1 zymogen into catalytically active caspase-1. Caspase-1 activation results in: 1) the processing and release of cytokines IL-1β and IL-18 and 2) pyroptosis, an immunogenic form of cell death.

The Caspase-Glo® 1 Inflammasome Assay provides a luminogenic caspase-1 substrate, Z-WEHD-aminoluciferin, in a lytic reagent optimized for caspase-1 activity and luciferase activity. A single addition of this reagent results in cell lysis, substrate cleavage by caspase-1 and generation of light by a proprietary, thermostable, recombinant luciferase (Ultra-Glo™ Recombinant Luciferase). The coupled-enzyme system reaches a steady-state between caspase cleavage of the substrate and luciferase conversion of aminoluciferin. These simultaneous reactions generate a stable luminescent signal, which is proportional to caspase activity. Inclusion of the proteasome inhibitor MG-132 in the reagent eliminates nonspecific proteasome-mediated cleavage of the substrate, enabling sensitive measurement of caspase-1 activity.

Features:

- **Spend Minimal Hands-On Time:** The assay measures caspase-1 activity directly in cells or medium from cultured cells in multiwell plates. No lysate preparation or multiple pipetting steps required.
- **Confirm Specific Activity:** The selective caspase-1 substrate (Z-WEHD) and Inhibitor (MG-132) enable direct detection of caspase-1 activity in cells or culture media. The kit includes a caspase-1-specific inhibitor to confirm specific activity in parallel samples.
- **Perform Assay Quickly:** No sample preparation or manipulation is required. Add the Caspase-Glo® 1 Reagent to wells and measure luminescence after only 1 hour. Less time and labor required compared to Western blot and ELISA.
- **Measure Only Catalytically Active Caspase-1:** Functional and quantitative assay enables precise time courses of enzyme function. Western blots and ELISAs don't necessarily monitor the active enzyme.
- **Expect Sensitivity:** The assay provides the sensitivity required to measure caspase-1 activity directly in cells or medium in multiwell plates.
- **Enjoy Flexible Assay Setup:** An equal volume of reagent is added to cell culture medium in sample wells, enabling easy scaling to different multiwell formats.
- **Use Batch Processing:** The luminescent caspase-1 signal is stable in the Caspase-Glo® 1 Reagent (half-life >3 hours), allowing plates to be read over a few hours. There is no need to use a luminometer with reagent injectors.
- **Employ Assay Multiplexing:** Caspase-1 activity can be monitored in culture medium, preserving the biological sample for use with other assays. In addition, same-well multiplexing can be performed with compatible assay chemistries (e.g., CellTox™ Green Cytotoxicity Assay).

Storage Conditions: Store at –30°C to –10°C.

Oxidative Stress Assays

Mitochondrial Toxicity Assay

Product	Size	Cat.#
Mitochondrial ToxGlo™ Assay	10 ml	G8000
	100 ml	G8001

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Mitochondrial ToxGlo™ Assay is a cell-based assay method that employs a sequential addition, multiplexed assay chemistry for predicting potential mitochondrial dysfunction as a result of xenobiotic exposure. The assay is based on the differential measurement of biomarkers associated with changes in cell membrane integrity and cellular ATP levels relative to vehicle-treated control cells during short exposure periods. Cell membrane integrity is first assessed by measuring the presence or absence of a distinct protease activity associated with necrosis using a fluorogenic peptide substrate (bis-AAF-R110) to measure "dead cell protease activity". The bis-AAF-R110 Substrate cannot cross the intact membrane of live cells and therefore gives no signal with viable cells. Next, ATP is measured by adding an ATP detection reagent, resulting in cell lysis and generation of a luminescent signal proportional to the amount of ATP present. The two sets of data can be combined to produce profiles representative of mitochondrial dysfunction or non-mitochondrial related cytotoxic mechanisms.

Mammalian cells generate ATP by mitochondrial (oxidative phosphorylation) and non-mitochondrial (glycolysis) methods. To achieve optimal mitochondrial responsiveness, it may be necessary to refine cell culture conditions. Replacing glucose-supplemented medium with galactose-containing medium may increase cellular oxygen consumption and augment mitochondrial susceptibility to mitotoxicants.

Features:

- **Distinguish Primary Mitochondrial Dysfunction from Secondary Cytotoxic Events:** Cell-based, multiplexed method measures ATP (a proximal measure of mitochondrial function) in conjunction with a membrane integrity biomarker to distinguish primary mitochondrial dysfunction from secondary cytotoxic events directly in the same sample well.
- **Predictive for Mitochondrial Toxicities:** Produces profiles that are consistent with mitochondrial toxicity and discernible from other non-mitotoxic mechanisms of cell death.
- **Easy to Implement:** The assay uses a simple sequential "add-mix-read" format.
- **Fast:** Quickly assess potential mitochondrial liabilities in under an hour.
- **Cost-Effective:** Assays are performed directly in cell culture plates using standard multimode detection instrumentation.
- **Flexible and Easily Automated:** The volume of reagent addition can be scaled to meet throughput needs; the assay is amenable to automation in 96- and 384-well plates.

Storage Conditions: Store the Mitochondrial ToxGlo™ Assay components at –20°C.

Available in the Helix® on-site stocking system

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ROS-Glo™ H_2O_2 Assay

Product	Size	Cat.#
ROS-Glo™ H_2O_2 Assay	10 ml	G8820
	50 ml	G8821

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ROS-Glo™ H_2O_2 Assay is a homogeneous, fast and sensitive bioluminescent assay that measures the level of hydrogen peroxide (H_2O_2), a reactive oxygen species (ROS), directly in cell culture or in defined enzyme reactions. A derivatized luciferin substrate is incubated with sample and reacts directly with H_2O_2 to generate a luciferin precursor. Addition of ROS-Glo™ Detection Solution converts the precursor to luciferin and provides Ultra-Glo™ Recombinant Luciferase to produce light signal that is proportional to the level of H_2O_2 present in the sample.

Features:

- **Direct Cell-Based Detection:** The assay can be performed in various cell culture media with or without serum, eliminating the need to remove the media from cultured cells before performing the assay.
- **Simple and Fast Assay:** The homogeneous assay is performed following a simple two-reagent-addition protocol that does not require sample manipulation. The assay can be completed in less than 2 hours after reagent addition.
- **Non-HRP-Based Detection:** The ROS-Glo™ H_2O_2 Substrate reacts directly with H_2O_2, obviating the need for horseradish peroxidase (HRP) as a coupling enzyme and thus eliminating false hits associated with HRP inhibition.
- **Automation-Compatible Format:** Easily scale from 96- to 384-well plate formats.
- **Flexible Assay:** The assay can be used to screen compounds in both cell-based and enzyme-based formats.
- **Multiplex-Compatible System:** Get more informative data per well and reduce cell culture expenses by multiplexing with a real-time cytotoxicity assay (CellTox™ Green Cytotoxicity Assay) in the same well or with a viability assay.

Storage Conditions: Store all components at –30°C to –10°C.

GSH/GSSG-Glo™ Assay

Product	Size	Cat.#
GSH/GSSG-Glo™ Assay	10 ml	V6611
	50 ml	V6612

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The GSH/GSSG-Glo™ Assay is a luminescence-based system for the detection and quantification of total glutathione (GSH +GSSG), GSSG and GSH/GSSG ratios in cultured cells. A change in GSH levels is important in the assessment of toxicological responses and is an indicator of oxidative stress, potentially leading to apoptosis or cell death. The assay provides a simple, rapid multiwell-plate format where stable luminescent signals are correlated with either the total GSH or the GSSG concentration of a sample directly in culture wells. Both total glutathione and GSSG determinations are based on the reaction where GSH-dependent conversion of a GSH probe, Luciferin-NT, to luciferin by a glutathione-S-transferase enzyme is coupled to a firefly luciferase reaction. Light from luciferase is dependent on the amount of luciferin formed, which is in turn dependent on the amount of GSH present. This makes the luminescent signal proportional to the amount of GSH. Determination of total glutathione and GSSG are performed in parallel reactions. In one configuration the assay reagents measure total glutathione using a reducing agent that converts all the glutathione, GSH and GSSG in a cell lysate to the reduced form, GSH. In a second configuration the assay reagents are used to measure only the oxidized form, GSSG. In this case, a reagent is added that blocks all the GSH while leaving the GSSG intact. This blocking step is followed by a reducing step that converts the GSSG to GSH for quantification in the luminescent reaction. Because the assays are performed directly on cells in culture wells, loss of GSH or GSSG is minimized, reducing variability.

Features:

- **Physiologically Relevant GSH/GSSG Ratios:** Actual levels of total glutathione and GSSG are measured directly in cell-culture wells, minimizing the loss of GSH and GSSG, compared to conventional assays that require upfront sample preparation and indirect GSSG calculation.
- **More Robust Performance:** Bioluminescent technology and a simple protocol minimize sample handling, reducing variability.
- **Simplified Protocol:** Assay reagents are added directly to cells cultured in multiwell plates. The homogeneous add-mix-read format eliminates time-consuming sample deproteination and centrifugation steps required of conventional assays.
- **Greater Sensitivity:** Fewer cells are required in these assays than in conventional assays because of the enhanced sensitivity.
- **Faster Results:** The homogeneous add-mix-read protocol minimizes hands-on time, and the bioluminescence technology minimizes incubation time.
- **Adaptable to Automation:** The glow-type signal is stable, with a half-life greater than two hours, and the protocol is adaptable to automation in 96- and 384-well plates.
- **No Fluorescence Interference:** Using luminescence readout eliminates the fluorescent interference between reagents and test compounds sometimes seen in fluorescence assays. Such overlap can confound analysis and present misleading or irrelevant data.

Storage Conditions: Store at –20°C protected from light.

GSH-Glo™ Glutathione Assay

Product	Size	Cat.#
GSH-Glo™ Glutathione Assay	10 ml	V6911
	50 ml	V6912

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The GSH-Glo™ Assay is a luminescent-based assay for the detection and quantification of glutathione (GSH) in cells or in various biological samples. A change in GSH levels is important in assessment of toxicological responses and is an indicator of oxidative stress, potentially leading to apoptosis or cell death. The assay is based on the conversion of a luciferin derivative into luciferin in the presence of GSH. The reaction is catalyzed by a glutathione S-transferase (GST) enzyme supplied in the kit. The luciferin formed is detected in a coupled reaction using Ultra-Glo™ Recombinant Luciferase that generates a glow type luminescence that is proportional to the amount of glutathione present in cells. The assay provides a simple, fast and sensitive alternative to colorimetric and fluorescent methods and can be adapted easily to high-throughput applications.

Features:

- **Fast:** Results in as little as 30 minutes.
- **Simplified Method:** The simple two-reagent-addition assay minimizes the number of assay steps compared to conventional GSH assays and is adapted easily to higher throughput applications. No deproteination step required!
- **Greater Sensitivity:** The luminescent method avoids inherent background fluorescence associated with other methods thereby providing excellent signal-to-background ratios.
- **Stable Signal:** Half-life greater than 5 hours.

Storage Conditions: Store at –20°C protected from light.

Griess Reagent System

Product	Size	Cat.#
Griess Reagent System	1,000 assays	G2930

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Griess Reagent System measures nitrite (NO_2^-), which is one of two primary stable and nonvolatile breakdown products of nitric oxide (NO). Nitric oxide is an important physiological messenger and effector molecule in many biological systems, including immunological, neuronal and cardiovascular tissues. This assay relies on a diazotization reaction that was originally described by Griess in 1879. Through the years, many modifications to the original reaction have been described.

The Griess Reagent System is based on a chemical reaction that uses sulfanilamide and N-1-naphthylethylenediamine dihydrochloride (NED) under acidic (phosphoric acid) conditions. This system detects NO_2^- in a variety of biological and experimental liquid matrices such as plasma, serum, urine and tissue culture medium. The nitrite sensitivity is dependent on the matrix. The limit of detection is 2.5µM (125pmol) nitrite (in ultrapure, deionized, distilled water) using the protocol described in Technical Bulletin #TB229.

Storage Conditions: Store at 4°C. Keep all solutions in their original light-protective plastic bottles.

Available in the Helix® on-site stocking system

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Promega

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A better way to detect luminescence.

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3 Cell Line and Sample Identification

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Cell Line Authentication

GenePrint® 10 System

Product	Size	Cat.#
GenePrint® 10 System	50 reactions	B9510
Available Separately	**Size**	**Conc.**	**Cat.#**
2800M Control DNA	25 µl	10 ng/µl	DD7101
Internal Lane Standard 600	150 µl		DG1071
Water, Amplification Grade	6,250 µl		DW0991

B9510, DD7101, DW0991 Not For Medical Diagnostic Use. DG1071 For Laboratory Use.

Description: The *GenePrint*® 10 System allows co-amplification and three-color detection of nine human loci, including the ASN-0002 loci (TH01, TPOX, vWA, Amelogenin, CSF1PO, D16S539, D7S820, D13S317 and D5S818) as well as D21S11. These loci collectively provide a genetic profile with a random match probability of 1 in 2.92×10^9.

The *GenePrint*® 10 System is compatible with the ABI PRISM® 3100 and 3100-*Avant* Genetic Analyzers and Applied Biosystems® 3130, 3130*xl*, 3500 and 3500xL Genetic Analyzers. You may need to optimize protocols including the amount of template DNA, cycle number, injection conditions and loading volume for your laboratory instrumentation.

The *GenePrint*® 10 System contains all materials necessary to amplify STR regions of human genomic DNA, including a hot-start thermostable DNA polymerase, which is a component of the *GenePrint*® 10 5X Master Mix. An internal lane standard (ILS) and allelic ladder are provided for standardization, and the 2800M Control DNA is supplied as a positive control. The ILS is added to every sample after amplification and used within each capillary electrophoresis run to determine the size of each amplified product. The allelic ladder consists of the most common alleles at a particular locus and is used as a standard to positively identify each allele. *GenePrint*® 10 Allelic Ladder Mix information, including the size range and repeat numbers for each allele, can be found in the GenePrint® *10 System Technical Manual*. The 2800M Control DNA has a known genotype and can be used to verify genotyping accuracy.

Features:

- **Amplification of ANSI-0002-Recommended Loci (plus Amelogenin and D21S11 for extra power of discrimination):** Accurately discriminate between biological samples and human cell lines. The resulting STR profiles are compatible with publicly available databases. Fewer loci simplify data interpretation.
- **Improved Buffer Formulation:** Compatibility with direct amplification from FTA® and nonFTA cards saves labor and time and reduces manipulation and possible introduction of inhibitors or contaminants.
- **Tolerance of Higher DNA Template Input:** Better balance for aneuploid samples.
- **Reduced PCR Time:** Amplify in less than 1.5 hours.
- **One Complete Kit:** Validated and quality-control tested for sample identification and cell line authentication.
- **Automatic Assignment of Genotypes:** Panels and bins text files are required to automatically assign genotypes using the GeneMapper® *ID* and *ID*-X software and are available for download at: **www.promega.com/resources/tools/genemapper-id-software-panels-and-bin-sets/**

Storage Conditions: Store at –20°C. Upon receipt, remove 2800M Control DNA and store at 4°C.

Mixed Sample Analysis

GenePrint® 24 System

Product	Size		Cat.#
GenePrint® 24 System	100 reactions		B1870
	400 reactions		B1874
Available Separately	**Size**	**Conc.**	**Cat.#**
WEN Internal Lane Standard 500	200 µl		DG5001
GenePrint® 5C Matrix Standard	5 preps		B1930
Water, Amplification Grade	6,250 µl		DW0991
2800M Control DNA	25 µl	10 ng/µl	DD7101

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The *GenePrint*® 24 System is a 24-locus multiplex system designed to generate a multi-locus human DNA profile from a variety of human-derived biological sources. This five-color system allows co-amplification and fluorescent detection of the following autosomal STR loci: CSF1PO, FGA, TH01, TPOX, vWA, D3S1358, D5S818, D7S820, D8S1179, D13S317, D16S539, D18S51, D21S11, D10S1248, D22S1045, D2S441, D1S1656, D12S391, D2S1338, D19S433, Penta D and Penta E plus Amelogenin for gender determination. In addition, the male-specific DYS391 locus is included to identify null Y allele results for Amelogenin.

The *GenePrint*® 24 System is compatible with 2.5 to 5ng of extracted DNA samples and requires fewer PCR cycles in lower reaction volumes than previous STR systems. This is particularly important when optimal heterozygote balance is desired.

The *GenePrint*® 24 System is compatible with the Applied Biosystems® 3130, 3130*xl*, 3500 and 3500xL Genetic Analyzers.

Panels and bins text files are required for automatic assignment of genotypes using the GeneMapper® and GeneMarker® software and are available for download.

Features:

- **Use Specialized Assay:** STR assay specifically for DNA fingerprinting and mixed sample analysis with abundant source material.
- **Obtain Optimal Heterozygote Balance:** Higher sample input for optimal heterozygote balance using up to 5ng of DNA template.
- **Take Advantage of High Power of Discrimination:** Identify unique alleles to resolve complex mixtures from related individuals or multiple sources.
- **Employ Streamlined Workflow:** Improve productivity with rapid cycling and more loci.
- **Simplify Validation:** Simplify validation and continuity using loci in concordance with previously generated data.

Storage Conditions: Store kit at –20°C. Upon receipt, move 2800M Control DNA and WEN ILS 500 to 4°C storage.

GenePrint® 5C Matrix Standard

Product	Size	Cat.#
GenePrint® 5C Matrix Standard	5 preps	B1930

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The *GenePrint*® 5C Matrix Standard allows the *GenePrint*® 24 System to be analyzed on the Applied Biosystems® 3130, 3130*xl*, 3500 and 3500xL Genetic Analyzers.

Proper generation of a spectral calibration file is critical to evaluate multicolor systems. The *GenePrint*® 5C Matrix Standard contains matrix fragments labeled with five fluorescent dyes: Fluorescein, JOE, TMR-ET, CXR-ET and CC5. Once generated, the spectral calibration file is applied during collection of PowerPlex® data to calculate and compensate for spectral overlap between different fluorescent dye colors.

Storage Conditions: Store *GenePrint*® 5C Matrix Standard at 4°C after the first use. The matrix standard is light-sensitive; therefore, minimize light exposure.

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Ask A Scientist

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Promega

Cell Signaling

4 Cell Signaling

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Glycobiology

GDP-Glo™ Glycosyltransferase Assay

Product	Size	Cat.#
GDP-Glo™ Glycosyltransferase Assay	200 assays	VA1090
	400 assays	VA1091
	4,000 assays	VA1092
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The GDP-Glo™ Glycosyltransferase Assay is a homogeneous, single-reagent-addition method to rapidly detect GDP formation in glycosyltransferase reactions. After the glycosyltransferase reaction, an equal volume of GDP Detection Reagent is added to simultaneously convert the GDP product to ATP and generate light in a luciferase reaction. The light generated is detected using a luminometer, and the light output is proportional to the concentration of GDP from low nM to 25µM. Luminescence can be correlated to GDP concentration by using a GDP standard curve.

Features:

- Easy, "add-incubate-read" protocol
- Detects any glycosyltransferase that uses GDP-sugar as a substrate
- Ideal for low-activity glycosyltransferases

Storage Conditions: Store at less than –65°C. Alternatively, store GDP-Glo™ Enzyme at less than –65°C and the other components at –30°C to –10°C.

UMP/CMP-Glo™ Glycosyltransferase Assay

Product	Size	Cat.#
UMP/CMP-Glo™ Glycosyltransferase Assay	200 assays	VA1130
	400 assays	VA1131
	4,000 assays	VA1132
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The UMP/CMP-Glo™ Glycosyltransferase Assay is a homogeneous, single-reagent-addition method to rapidly detect UMP or CMP formation in glycosyltransferase reactions. After the glycosyltransferase reaction, an equal volume of UMP/CMP Detection Reagent is added to simultaneously convert the UMP or CMP product to ATP and generate light in a luciferase reaction. The light generated is detected using a luminometer, and the light output is proportional to the concentration of UMP or CMP from low nM to 50µM. Luminescence can be correlated to UMP or CMP concentration by using a
UMP or CMP standard curve.

Features:

- Easy, "add-incubate-read" protocol
- Detects sialyltransferases and phosphoglycosyltransferases that use CMP-, CDP- or UDP-sugars as donor substrates
- Ideal for low-activity glycosyltransferases

Storage Conditions: Store at less than –65°C. Alternatively, store UMP/CMP-Glo™ Enzyme at less than –65°C and the other components at –30°C to –10°C.

Ultra Pure GDP-Sugar Substrates

Product	Size	Cat.#
Ultra Pure GDP-Fucose, 50mM	50µl	VA1097
	5 × 50µl	VA1098
Ultra Pure GDP-Mannose, 100mM	50µl	VA1099
	5 × 50µl	VA1100
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: GDP-Fucose, 50mM, and GDP-Mannose, 100mM, are ultra pure GDP-sugar substrates designed for use with the GDP-Glo™ Glycosyltransferase Assay—a bioluminescent assay for detecting the activity of glycosyltransferases that use GDP-sugars as donor substrates.

Glycosylation reactions catalyzed by glycosyltransferases are central to many biological processes, including cell:cell interactions, cell signaling and bacterial cell wall biosynthesis. Glycosyltransferases transfer sugar from a nucleotide-glycosyl donor (e.g., GDP-Fucose and GDP-Mannose) to an acceptor molecule. In a glycosyltransferase reaction, the GDP moiety is released as a product; therefore, an assay that detects GDP can be used to monitor the activity of all the GDP-sugar-utilizing glycosyltransferases (e.g., Fucosyltransferases).

Storage Conditions: Store at less than –65°C.

GPCR Signaling Assays

GTPase-Glo™ Assay

Product	Size	Cat.#
GTPase-Glo™ Assay	1,000 assays	V7681
	10,000 assays	V7682

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The GTPase-Glo™ Assay assesses the activities of GTPases, GAPs and GEFs, which are components of the GTPase cycle, by detecting the amount of GTP remaining after GTP hydrolysis in a GTPase reaction. The remaining GTP is converted to ATP using the GTPase-Glo™ Reagent, and the ATP is then detected using a proprietary thermostable luciferase (Ultra-Glo™ Recombinant Luciferase) and luciferin substrate to produce bioluminescence. The kit contains optimized reaction buffers, GTPase/GAP Buffer and GEF Buffer, for performing GTPase and GAP reactions and GEF reactions, respectively. These two buffers primarily differ in their Mg^{2+} content, which is critical for the nucleotide loading and unloading of the GTPase, thereby affecting the GTPase cycle. With the GTPase-Glo™ Assay, you can measure intrinsic GTPase activity, GAP-stimulated GTPase activity, GAP activity and GEF activity. GTPase, GAP and GEF activity is inversely correlated to the amount of light produced. A highly active GTPase hydrolyzes more GTP, reducing the amount of ATP produced from GTP and reducing light output. A less active GTPase hydrolyzes less GTP, leaving a larger amount of GTP to be converted to ATP and producing more light.

Features:

- **Easily Monitor GTPase Activity:** Simple add-and-read format.
- **Measure the Effects of Associated Proteins:** Use to measure the effects of GEFs and GAPs, for example.
- **Produce Excellent Signal-to-Noise Ratios at Low Enzyme Concentrations:** Sensitive assay with low background and large dynamic range.
- **Use Natural Substrates:** No need to modify substrates, which can lead to kinetic artifacts.
- **Scale Your Assay:** Suitable for 96-, 384- and 1536-well plates.
- **Rely on a Stable Luminescent Signal:** Perform batch plate processing without need for strictly timed incubations; flexible.

Storage Conditions: Store the GTPase-Glo™ Assay at –20°C, where it is stable for 6 months. Before use, thaw all components completely at room temperature and mix thoroughly. At first use, dispense the Detection Reagent into single-use aliquots and store at –20°C to minimize freeze-thaw cycles of the reagent.

cAMP-Glo™ Assay

Product	Size	Cat.#
cAMP-Glo™ Assay	300 assays	V1501
	3,000 assays	V1502
	30,000 assays	V1503

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The cAMP-Glo™ Assay is a homogeneous, bioluminescent and high-throughput assay for measuring cAMP levels in cells. The cAMP-Glo™ Assay monitors cAMP production in cells in response to the effects of test compounds on G protein-coupled receptors (GPCR). GPCRs that couple with adenylate cyclase will increase or decrease intracellular cAMP. The assay is based on the principle that cyclic AMP (cAMP) stimulates protein kinase A (PKA) holoenzyme activity, decreasing available ATP and leading to decreased light production in a coupled luciferase reaction.

The cAMP-Glo™ Assay can be performed in 96-, 384- or 1536-well plates. The cells are induced with a test compound for an appropriate period of time to modulate cAMP levels. After induction, cells are lysed to release cAMP, then the cAMP detection solution, which contains protein kinase A, is added. The Kinase-Glo® Reagent is then added to terminate the PKA reaction and detect the remaining ATP via a luciferase reaction. Plates are read using a microplate-reading luminometer. Luminescence can be correlated to the cAMP concentrations by using a cAMP standard curve. The half-life for the luminescent signal is greater than 4 hours. This extended signal half-life eliminates the need for luminometers with reagent injectors and allows batch-mode processing of multiple plates.

Features:

Fast and Easy to Use:

- Assay can be completed in approximately 45 minutes.
- Homogeneous.
- Two steps following lysis of cells.

Excellent Signal-to-Noise Ratios:

- Best signal:background ratio of all the cAMP assays.
- Signal:Background >200 (with cAMP), >15 (on cells).
- Easily scalable to 1536-well plate formats and beyond.

Proven Luminescent Technology:

- Powered by Ultra-Glo™ Recombinant Luciferase.
- No interference by fluorescent compounds.
- Non-radioactive.

Storage Conditions: Store the system at –20°C. Once prepared, the cAMP detection solution (cAMP-Glo™ Reaction Buffer with Protein Kinase A) should not be frozen. Once prepared, the Kinase-Glo® Reagent should be dispensed into aliquots and stored at –20°C. See the product label for the expiration date.

Available in the Helix® on-site stocking system

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cAMP-Glo™ Max Assay

Product	Size	Cat.#
cAMP-Glo™ Max Assay	2 plates	V1681
	20 plates	V1682
	10 × 20 plates	V1683

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The cAMP-Glo™ Max Assay is a homogeneous, bioluminescent and high-throughput assay to measure cyclic AMP (cAMP) levels in cells. Compounds that modulate GPCRs coupled with adenylate cyclase typically alter intracellular cAMP levels. The cAMP-Glo™ Max Assay monitors cAMP levels in cells in response to the effect of agonists, antagonists or test compounds on G protein-coupled receptors (GPCRs). The assay is based on the principle that cyclic AMP (cAMP) stimulates protein kinase A (PKA) holoenzyme activity, decreasing available ATP and leading to decreased light production in a coupled luciferase reaction.

This improved version combines the lysis and cAMP reaction buffers into the cAMP-Glo™ ONE Buffer. This new format streamlines the protocol and reduces the time needed to complete the assay. The new ONE Buffer is supplied at a 5X concentration, which provides increased flexibility for starting cell culture volumes.

The cAMP-Glo™ Max Assay can be performed in 96-, 384- or 1536-well plates. The cells are induced with a test compound for an appropriate period of time to modulate cAMP levels. After induction, cells are lysed, and the cAMP released stimulates protein kinase A in the reagent. The Kinase-Glo® Reagent is then added to terminate the PKA reaction and detect the remaining ATP via a luciferase reaction. Plates are read using a microplate-reading luminometer. The half-life for the luminescent signal is greater than 4 hours providing ample time to read the plates and eliminating the need for luminometers with reagent injectors.

Features:

Fast and Easy to Use:

- Improved—Lysis and cAMP detection steps combined (cAMP-Glo™ ONE Buffer).
- ONE Buffer—5X concentration provides better flexibility for starting cell culture volumes.
- Assay can be completed in approximately 30 minutes.

Excellent Signal-to-Noise Ratios:

- Best signal:background ratio of all the cAMP assays.
- Signal:Background >200 (with cAMP), >15 (on cells).
- Easily scalable to 1536-well plate formats and beyond.

Proven Luminescent Technology:

- Powered by Ultra-Glo™ Recombinant Luciferase.
- No interference by fluorescent compounds.
- Non-radioactive.

Storage Conditions: Store the system at –20°C. Before use, completely thaw all components at room temperature, except for the Protein Kinase A, which should be kept on ice when not at –20°C. After thawing, mix all components thoroughly before use. Once prepared, the cAMP detection solution (cAMP-Glo™ ONE Buffer with Protein Kinase A) should not be frozen. Once prepared, the Kinase-Glo® Reagent should be dispensed into aliquots and stored at –20°C. See the product label for the expiration date.

GloSensor™ cAMP Assay

Product	Size	Cat.#
pGloSensor™-22F cAMP Plasmid	20 µg	E2301
pGloSensor™-20F cAMP Plasmid	20 µg	E1171
GloSensor™ cAMP Reagent	25 mg	E1290
	250 mg	E1291

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The GloSensor™ cAMP Assay presents a novel approach to measuring cAMP levels in live cells. cAMP is a key second messenger involved in signal transduction of GPCRs acting through Gα-s and Gα-i proteins. The new assay is based on the GloSensor™ Technology, a genetically modified form of firefly luciferase into which a cAMP-binding protein moiety has been inserted. Upon binding of cAMP, conformational change is induced leading to increased light output. This live-cell assay excels at kinetic and modulation studies of signaling through cAMP.

Researchers can use the GloSensor™ cAMP Assay by transiently expressing a receptor of interest and the biosensor in the cell line of choice. Alternatively, stably transfected cell lines with both the biosensor and the receptor of interest can be made. The protocol is simple: Cells are pre-equilibrated with GloSensor™ cAMP Reagent for approximately 2 hours; then cells are treated with specific agonists/antagonists or compounds, and luminescence is measured after 10–30 minutes. No other reagent additions or manipulations are required. Most any common luminometer with injectors is sufficient to read the assay. GloSensor™ cAMP Reagent is required for use with this assay per the GloSensor™ Limited Use Label License.

Choosing the Appropriate Plasmid

We offer two variants of the biosensor, and we recommend the pGloSensor™-22F cAMP Plasmid as the first choice for most applications.

pGloSensor™-22F cAMP Plasmid. Following cell-free expression in vitro, the version encoded by this construct shows an increased EC_{50} for activation together with increased signal-to-background ratio at cAMP saturation relative to the version encoded by the pGloSensor™-20F cAMP construct. In general, we have observed similar relationships between the two constructs when their performance is compared in living cells.

pGloSensor™-20F cAMP Plasmid. The version encoded by this construct performs well in HEK293 cells at 37°C. Luminescence from the pGloSensor™-22F cAMP Plasmid construct can be more difficult to detect at physiologic temperatures.

For a more thorough explanation of the general performance differences between the two plasmids, please consult Section 3.B, Recommendations on Choice of GloSensor™ Plasmid, in the Technical Manual (#TM076).

Features:

- **Best-in-Class Performance:** High Z′-factor values and large signal:background ratio values. Ideally suited to HTS/uHTS. Up to 1,000-fold changes in light output obtained.
- **Live-Cell, Nonlytic Assay Format:** "Zero-step assay" greatly facilitates HTS/uHTS. Easy monitoring of cAMP in live cells enables a more complete analysis of receptor biology.
- **High Sensitivity and Increased Biological Relevance:** Easy detection of low-abundance, endogenous receptors; direct detection of Gi-coupled receptor activation and inverse agonist activity in the absence of added forskolin. PDE inhibitors not needed.

Storage Conditions: Store the pGloSensor™ cAMP Plasmid at –20°C and the GloSensor™ cAMP Reagent at –70°C. Store the resuspended GloSensor™ cAMP Reagent at –70°C in single-use aliquots.

PDE-Glo™ Phosphodiesterase Assay

Product	Size	Cat.#
PDE-Glo™ Phosphodiesterase Assay	1,000 assays	V1361
	10,000 assays	V1362

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The PDE-Glo™ Phosphodiesterase Assay is a luminescent, high-throughput screening (HTS) method for measuring cyclic nucleotide phosphodiesterase activity from **purified** sources. Cyclic nucleotide phosphodiesterases (PDEs) are involved in a myriad of cellular processes due to their ability to hydrolyze, and thus control, the levels of the second-messenger signaling molecules cAMP and cGMP.

The availability of selective inhibitors for PDEs has facilitated their use as tools to study cyclic nucleotide signaling and paved the way to investigate the role of PDEs in cellular and tissue pathologies. The PDE-Glo™ Phosphodiesterase Assay allows lead candidates to be identified from compound libraries. The assay is designed for 384-well plates, but assay volumes can easily be scaled for 96- or 1536-well plates. The PDE-Glo™ Phosphodiesterase Assay is optimized to work with both cAMP- and cGMP-dependent phosphodiesterases. The total time required for the assay from start to finish is less than 1 hour after the PDE reaction is complete.

Features:

Versatile: Works with **both** cAMP and cGMP PDEs.

Sensitive:

- Excellent signal:background ratios.
- Scalable to 1536-well plate formats.

Fast and Easy to Use:

- Assay can be completed in <1 hour.
- Homogeneous.

Proven Luminescent Technology:

- Powered by Ultra-Glo™ Luciferase.
- Non-radioactive.

No Interference by Fluorescent Compounds.

Storage Conditions: Store the system at –20°C. See the product label for the expiration date.

GloResponse™ Luciferase Reporter Cell Lines

Product	Size	Cat.#
GloResponse™ CRE-*luc2P* HEK293 Cell Line	2 vials	E8500
GloResponse™ NFAT-RE-*luc2P* HEK293 Cell Line	2 vials	E8510
GloResponse™ NF-κB-RE-*luc2P* HEK293 Cell Line	2 vials	E8520

For Research Use Only. Not for Use in Diagnostic Procedures.

For additional information see page 92.

GTPase-Glo™ Assay

Product	Size	Cat.#
GTPase-Glo™ Assay	1,000 assays	V7681
	10,000 assays	V7682

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The GTPase-Glo™ Assay assesses the activities of GTPases, GAPs and GEFs, which are components of the GTPase cycle, by detecting the amount of GTP remaining after GTP hydrolysis in a GTPase reaction. The remaining GTP is converted to ATP using the GTPase-Glo™ Reagent, and the ATP is then detected using a proprietary thermostable luciferase (Ultra-Glo™ Recombinant Luciferase) and luciferin substrate to produce bioluminescence. The kit contains optimized reaction buffers, GTPase/GAP Buffer and GEF Buffer, for performing GTPase and GAP reactions and GEF reactions, respectively. These two buffers primarily differ in their Mg^{2+} content, which is critical for the nucleotide loading and unloading of the GTPase, thereby affecting the GTPase cycle. With the GTPase-Glo™ Assay, you can measure intrinsic GTPase activity, GAP-stimulated GTPase activity, GAP activity and GEF activity. GTPase, GAP and GEF activity is inversely correlated to the amount of light produced. A highly active GTPase hydrolyzes more GTP, reducing the amount of ATP produced from GTP and reducing light output. A less active GTPase hydrolyzes less GTP, leaving a larger amount of GTP to be converted to ATP and producing more light.

Features:

- **Easily Monitor GTPase Activity:** Simple add-and-read format.
- **Measure the Effects of Associated Proteins:** Use to measure the effects of GEFs and GAPs, for example.
- **Produce Excellent Signal-to-Noise Ratios at Low Enzyme Concentrations:** Sensitive assay with low background and large dynamic range.
- **Use Natural Substrates:** No need to modify substrates, which can lead to kinetic artifacts.
- **Scale Your Assay:** Suitable for 96-, 384- and 1536-well plates.
- **Rely on a Stable Luminescent Signal:** Perform batch plate processing without need for strictly timed incubations; flexible.

Storage Conditions: Store the GTPase-Glo™ Assay at –20°C, where it is stable for 6 months. Before use, thaw all components completely at room temperature and mix thoroughly. At first use, dispense the Detection Reagent into single-use aliquots and store at –20°C to minimize freeze-thaw cycles of the reagent.

Available in the Helix® on-site stocking system

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Kinase Target Engagement

NanoBRET™ TE Intracellular Kinase Assay

Product	Size	Cat.#
NanoBRET™ TE Intracellular Kinase Assay, K-4	100 assays	N2520
	1,000 assays	N2521
NanoBRET™ TE Intracellular Kinase Detection Reagents, K-4	10,000 assays	N2540
NanoBRET™ TE Intracellular Kinase Assay, K-5	100 assays	N2500
	1,000 assays	N2501
NanoBRET™ TE Intracellular Kinase Detection Reagents, K-5	10,000 assays	N2530
Intracellular TE Nano-Glo® Substrate/Inhibitor	1,000 assays	N2160
	10,000 assays	N2161
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The NanoBRET™ Target Engagement (TE) Intracellular Kinase Assay measures compound binding at select target kinases in intact cells. The assay is based on the NanoBRET™ System, an energy transfer technique designed to measure molecular proximity in living cells. The NanoBRET™ TE Assay measures the apparent affinity of test compounds by competitive displacement of the NanoBRET™ tracer, reversibly bound to a NanoLuc® luciferase-kinase fusions in cells.

Features:

- Detect kinase target engagement in live cells
- Choose from >125 kinase fusion vectors

Storage Conditions: Store at less than –65°C. Alternatively, store NanoBRET™ Tracer at less than –65°C and all other components at less than –10°C.

NanoBRET™ Tracer K-4-Compatible Kinase-NanoLuc® Fusion Vectors

Product	Size	Cat.#
NanoLuc®-ABL1 Fusion Vector	20µg	NV1011
BMX-NanoLuc® Fusion Vector	20µg	NV1101
CSF1R-NanoLuc® Fusion Vector	20µg	NV1161
CSK-NanoLuc® Fusion Vector	20µg	NV1171
DDR1-NanoLuc® Fusion Vector	20µg	N2451
DDR2-NanoLuc® Fusion Vector	20µg	NV1201
EPHA1-NanoLuc® Fusion Vector	20µg	NV1221
EPHA2-NanoLuc® Fusion Vector	20µg	NV1231
EPHA4-NanoLuc® Fusion Vector	20µg	NV1241
EPHA5-NanoLuc® Fusion Vector	20µg	NV1251
EPHA8-NanoLuc® Fusion Vector	20µg	NV1281
EPHB2-NanoLuc® Fusion Vector	20µg	NV1291
EPHB3-NanoLuc® Fusion Vector	20µg	NV1301
EPHB4-NanoLuc® Fusion Vector	20µg	NV1311
NanoLuc®-FGR Fusion Vector	20µg	NV1381
FRK-NanoLuc® Fusion Vector	20µg	NV1401
FYN-NanoLuc® Fusion Vector	20µg	NV1411
KIT-NanoLuc® Fusion Vector	20µg	NV1491
LCK-NanoLuc® Fusion Vector	20µg	NV1521
LIMK2-NanoLuc® Fusion Vector	20µg	NV1531
LYN-NanoLuc® Fusion Vector	20µg	NV1551
NanoLuc®-MAPK11 Fusion Vector	20µg	NV1651
MAPK14-NanoLuc® Fusion Vector	20µg	NV1661
PTK6-NanoLuc® Fusion Vector	20µg	NV1941
NanoLuc®-RIPK2 Fusion Vector	20µg	NV1971
NanoLuc®-SIK1 Fusion Vector	20µg	NV2031
NanoLuc®-SIK3 Fusion Vector	20µg	NV2041
NanoLuc®-SNF1LK2 Fusion Vector	20µg	NV2061
SRC-NanoLuc® Fusion Vector	20µg	NV2071
NanoLuc®-TEC Fusion Vector	20µg	NV2141
NanoLuc®-TESK1 Fusion Vector	20µg	NV2161
TXK-NanoLuc® Fusion Vector	20µg	NV2201
YES1-NanoLuc® Fusion Vector	20µg	NV2241
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Description: These NanoLuc® Fusion Vectors are designed for use with the NanoBRET™ Target Engagement (TE) Intracellular Kinase Assay, K-4, where the plasmid can be transfected into various cell lines for target engagement analysis. The NanoLuc® luciferase kinase fusion vectors are supplied transfection-ready.
The CMV promoter drives the expression of the full-length NanoLuc® kinase fusion protein.

Features:

- Transfection-ready DNA to express full-length kinase of interest fused to NanoLuc® luciferase
- Measures kinase target engagement in live cells
- Use with NanoBRET™ TE Intracellular Kinase Assay, K-4

Storage Conditions: Store at –30°C to –10°C.

NanoBRET™ Tracer K-5-Compatible Kinase-NanoLuc® Fusion Vectors

Product	Size	Cat.#
NanoLuc®-AAK1 Fusion Vector	20µg	NV1001
ACVR1B-NanoLuc® Fusion Vector	20µg	NV1021
AKT2-NanoLuc® Fusion Vector	20µg	NV1031
AURKA-NanoLuc® Fusion Vector	20µg	NV1041
AURKB-NanoLuc® Fusion Vector	20µg	NV1051
AURKC-NanoLuc® Fusion Vector	20µg	NV1061
AXL-NanoLuc® Fusion Vector	20µg	NV1071
BTK-NanoLuc® Fusion Vector	20µg	N2441
NanoLuc®-BMP2K Fusion Vector	20µg	NV1091
NanoLuc®-BRSK2 Fusion Vector	20µg	NV1111
CDK5-NanoLuc® Fusion Vector	20µg	NV1121
NanoLuc®-CLK1 Fusion Vector	20µg	NV1131
CLK2-NanoLuc® Fusion Vector	20µg	NV1141
CLK4-NanoLuc® Fusion Vector	20µg	NV1151
NanoLuc®-CSNK1G2 Fusion Vector	20µg	NV1181
CSNK2A2-NanoLuc® Fusion Vector	20µg	NV1191
NanoLuc®-DYRK1B Fusion Vector	20µg	NV1211
EPHA6-NanoLuc® Fusion Vector	20µg	NV1261
EPHA7-NanoLuc® Fusion Vector	20µg	NV1271
ERN1-NanoLuc® Fusion Vector	20µg	NV1321
FER-NanoLuc® Fusion Vector	20µg	NV1331
FGFR1-NanoLuc® Fusion Vector	20µg	NV1341
FGFR2-NanoLuc® Fusion Vector	20µg	NV1351
FGFR3-NanoLuc® Fusion Vector	20µg	NV1361
FGFR4-NanoLuc® Fusion Vector	20µg	NV1371
FLT3-NanoLuc® Fusion Vector	20µg	NV1391
NanoLuc®-GAK Fusion Vector	20µg	NV1421
NanoLuc®-IKBKE Fusion Vector	20µg	NV1431
NanoLuc®-IRAK3 Fusion Vector	20µg	NV1441
IRAK4-NanoLuc® Fusion Vector	20µg	NV1451
NanoLuc®-ITK Fusion Vector	20µg	NV1461
JAK3-NanoLuc® Fusion Vector	20µg	NV1471
JNK3-NanoLuc® Fusion Vector	20µg	NV1481
LATS1-NanoLuc® Fusion Vector	20µg	NV1501
LATS2-NanoLuc® Fusion Vector	20µg	NV1511
LTK-NanoLuc® Fusion Vector	20µg	NV1541
NanoLuc®-MAP3K10 Fusion Vector	20µg	NV1561
NanoLuc®-MAP3K11 Fusion Vector	20µg	NV1571
NanoLuc®-MAP3K12 Fusion Vector	20µg	NV1581
MAP3K4-NanoLuc® Fusion Vector	20µg	NV1591
NanoLuc®-MAP3K9 Fusion Vector	20µg	NV1601
NanoLuc®-MAP4K1 Fusion Vector	20µg	NV1611
NanoLuc®-MAP4K2 Fusion Vector	20µg	NV1621
NanoLuc®-MAP4K3 Fusion Vector	20µg	NV1631
NanoLuc®-MAPK1 Fusion Vector	20µg	NV1641
NanoLuc®-MAPK3 Fusion Vector	20µg	NV1671
NanoLuc®-MAPK4 Fusion Vector	20µg	NV1681
NanoLuc®-MAPK6 Fusion Vector	20µg	NV1691
NanoLuc®-MAPK8 Fusion Vector	20µg	NV1701
NanoLuc®-MAPK9 Fusion Vector	20µg	NV1711
NanoLuc®-MARK2 Fusion Vector	20µg	NV1721
NanoLuc®-MARK4 Fusion Vector	20µg	NV1731
NanoLuc®-MELK Fusion Vector	20µg	NV1741
MET-NanoLuc® Fusion Vector	20µg	NV1751
MUSK-NanoLuc® Fusion Vector	20µg	NV1761
MYLK2-NanoLuc® Fusion Vector	20µg	NV1771
NanoLuc®-NEK2 Fusion Vector	20µg	NV1781
NanoLuc®-NEK3 Fusion Vector	20µg	NV1791
NanoLuc®-NEK9 Fusion Vector	20µg	NV1801
NTRK1-NanoLuc® Fusion Vector	20µg	NV1811
NTRK2-NanoLuc® Fusion Vector	20µg	NV1821
NanoLuc®-NUAK1 Fusion Vector	20µg	NV1831
PAK4-NanoLuc® Fusion Vector	20µg	NV1841
PAK7-NanoLuc® Fusion Vector	20µg	NV1851
NanoLuc®-PHKG1 Fusion Vector	20µg	NV1861
PKMYT1-NanoLuc® Fusion Vector	20µg	NV1871
NanoLuc®-PLK4 Fusion Vector	20µg	NV1881
NanoLuc®-PRKAA2 Fusion Vector	20µg	NV1891
PRKACA-NanoLuc® Fusion Vector	20µg	NV1901
PRKX-NanoLuc® Fusion Vector	20µg	NV1911
NanoLuc®-PTK2 Fusion Vector	20µg	NV1921
PTK2B-NanoLuc® Fusion Vector	20µg	NV1931
RET-NanoLuc® Fusion Vector	20µg	NV1951
NanoLuc®-RIOK2 Fusion Vector	20µg	NV1961
NanoLuc®-RPS6KA1 Fusion Vector	20µg	NV1981
NanoLuc®-RPS6KA2 Fusion Vector	20µg	NV1991
NanoLuc®-RPS6KA3 Fusion Vector	20µg	NV2001
NanoLuc®-RPS6KA4 Fusion Vector	20µg	NV2011
NanoLuc®-RPS6KA6 Fusion Vector	20µg	NV2021
NanoLuc®-SLK Fusion Vector	20µg	NV2051
NanoLuc®-STK11 Fusion Vector	20µg	NV2081
NanoLuc®-STK16 Fusion Vector	20µg	NV2091
NanoLuc®-STK32B Fusion Vector	20µg	NV2101
NanoLuc®-STK33 Fusion Vector	20µg	NV2111
STK38-NanoLuc® Fusion Vector	20µg	NV2121
NanoLuc®-TBK1 Fusion Vector	20µg	NV2131
TEK-NanoLuc® Fusion Vector	20µg	NV2151
TIE1-NanoLuc® Fusion Vector	20µg	NV2171
NanoLuc®-TNK1 Fusion Vector	20µg	NV2181
TTK-NanoLuc® Fusion Vector	20µg	NV2191
NanoLuc®-ULK1 Fusion Vector	20µg	NV2211
NanoLuc®-ULK2 Fusion Vector	20µg	NV2221
WEE1-NanoLuc® Fusion Vector	20µg	NV2231
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Description: These NanoLuc® Fusion Vectors are designed for use with the NanoBRET™ Target Engagement (TE) Intracellular Kinase Assay, K-5, where the plasmid can be transfected into various cell lines for target engagement analysis. The NanoLuc® luciferase kinase fusion vectors are supplied transfection-ready. The CMV promoter drives the expression of the full-length NanoLuc® kinase fusion protein.

Features:

- Transfection-ready DNA to express full-length kinase of interest fused to NanoLuc® luciferase
- Measures kinase target engagement in live cells
- Use with NanoBRET™ TE Intracellular Kinase Assay, K-5

Storage Conditions: Store at –30°C to –10°C.

Available in the Helix® on-site stocking system

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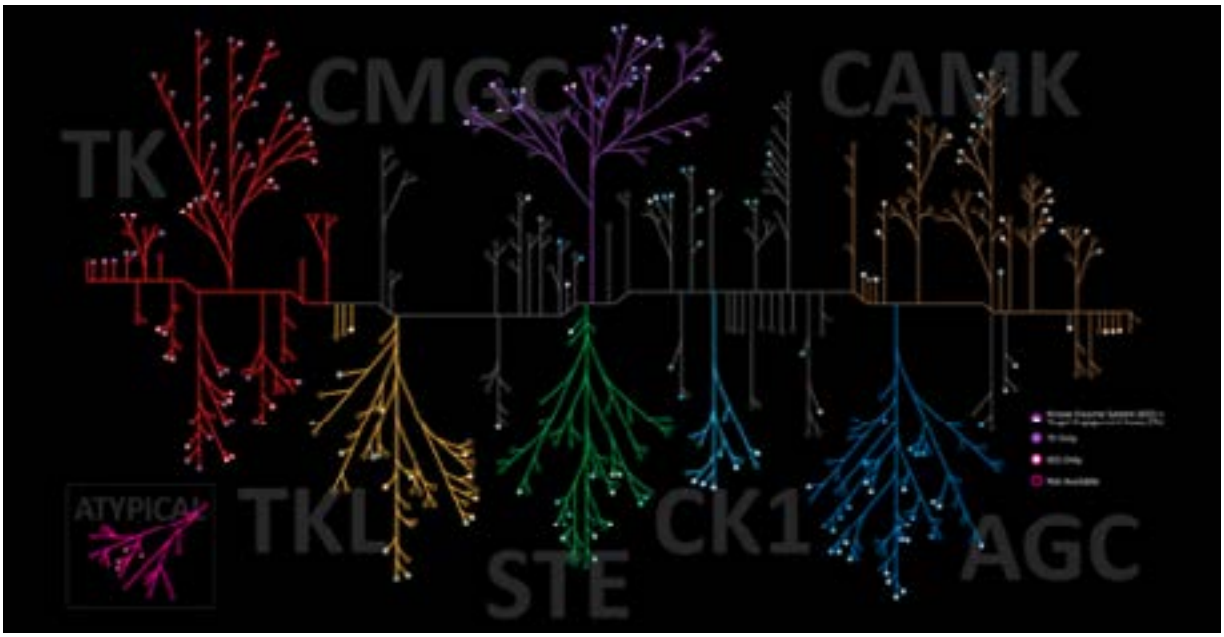
Kinase Activity Assays

The Kinase Enzyme Systems allow you to easily screen and profile kinase inhibitors. They provide all the optimized components (enzyme, preferred substrate, required cofactors, buffer) that you need to generate a kinase selectivity profile for a compound.

These sensitive and reliable kinase assays are easily scaled to meet your throughput needs. Select from over 370 Kinase Enzyme Systems spanning the breadth of the human kinome, including >100 mutant kinases.



Visit: **promega.com/kinome** to learn more.

Kinase Selectivity Profiling Systems

Product	Size	Cat.#
Kinase Selectivity Profiling System: TK-1	8 × 50 reactions	V6850
Kinase Selectivity Profiling System: TK-1 + ADP-Glo™ Assay	8 × 50 reactions	V6851
Kinase Selectivity Profiling System: TK-2	8 × 50 reactions	V6852
Kinase Selectivity Profiling System: TK-2 + ADP-Glo™ Assay	8 × 50 reactions	V6853
Kinase Selectivity Profiling System: TK-3	8 × 50 reactions	V6920
Kinase Selectivity Profiling System: TK-3 + ADP-Glo™ Assay	8 × 50 reactions	V6921
Kinase Selectivity Profiling System: TK-4	8 × 50 reactions	V6922
Kinase Selectivity Profiling System: TK-4 + ADP-Glo™ Assay	8 × 50 reactions	V6923
Kinase Selectivity Profiling System: CMGC-1	8 × 50 reactions	V6854
Kinase Selectivity Profiling System: CMGC-1 + ADP-Glo™ Assay	8 × 50 reactions	V6855
Kinase Selectivity Profiling System: CMGC-2	8 × 50 reactions	V6856
Kinase Selectivity Profiling System: CMGC-2 + ADP-Glo™ Assay	8 × 50 reactions	V6857
Kinase Selectivity Profiling System: AGC-1	8 × 50 reactions	V6858
Kinase Selectivity Profiling System: AGC-1 + ADP-Glo™ Assay	8 × 50 reactions	V6859
Kinase Selectivity Profiling System: AGC-2	8 × 50 reactions	V6910
Kinase Selectivity Profiling System: AGC-2 + ADP-Glo™ Assay	8 × 50 reactions	V6931
Kinase Selectivity Profiling System: CAMK-1	8 × 50 reactions	V6932
Kinase Selectivity Profiling System: CAMK-1 + ADP-Glo™ Assay	8 × 50 reactions	V6913
Kinase Selectivity Profiling System: CAMK-2	8 × 50 reactions	V6924
Kinase Selectivity Profiling System: CAMK-2 + ADP-Glo™ Assay	8 × 50 reactions	V6925
Kinase Selectivity Profiling System: TKL-1	8 × 50 reactions	V6914
Kinase Selectivity Profiling System: TKL-1 + ADP-Glo™ Assay	8 × 50 reactions	V6915
Kinase Selectivity Profiling System: STE-1	8 × 50 reactions	V6916
Kinase Selectivity Profiling System: STE-1 + ADP-Glo™ Assay	8 × 50 reactions	V6917
Kinase Selectivity Profiling System: Other/CK-1	8 × 50 reactions	V6918
Kinase Selectivity Profiling System: Other/CK-1 + ADP-Glo™ Assay	8 × 50 reactions	V6919
Kinase Selectivity Profiling System: Other-2	8 × 50 reactions	V6926
Kinase Selectivity Profiling System: Other-2 + ADP-Glo™ Assay	8 × 50 reactions	V6927
Kinase Selectivity Profiling System: General Panel	24 × 50 reactions	V6928
Kinase Selectivity Profiling System: General Panel + ADP-Glo™ Assay	24 × 50 reactions	V6929

V6850, V6851, V6852, V6920, V6922, V6854, V6856, V6858, V6910, V6931, V6932, V6913, V6924, V6914, V6916, V6918, V6926, V6928 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Kinase Selectivity Profiling Systems are easy-to-use kits for performing kinase selectivity profiling that rely on the ADP-Glo™ Kinase Assay technology. Each system includes kinase and substrate pairs organized in an easy-to-use, 8-tube strip format optimized for fast and simple kinase profiling reactions. Kinase Selectivity Profiling Systems offer kinases grouped either in single kinase family strips or as a general panel of kinases representative of the human kinome for a broad kinase profile. Each profiling system contains the reagents needed to complete a profile for a compound, including kinase reaction buffer, eight kinases in each multiwell strip and eight corresponding substrates and cofactors in another multiwell strip. The General Panel contains 24 kinases arranged in three 8-well strips. The kinase stock solutions are standardized in a way that, when kinases are diluted to the final concentration in the kinase reaction, the kinase activity will result in optimal ATP to ADP conversion in 5µl reactions (384-well plate), with a signal-to-background ratio of more than ten when used in conjunction with the ADP-Glo™ Kinase Assay (1). The substrate stock solutions are standardized in a similar fashion and provided in a second 8-tube strip with the substrates at corresponding positions.

ADP-Glo™ Kinase Assay is a luminescent kinase assay that measures ADP formed from a kinase reaction; ADP is converted into ATP, which is converted into light by Ultra-Glo™ Luciferase. The luminescent signal positively correlates with ADP amount and kinase activity. The assay is well suited for measuring the effects chemical compounds have on the activity of a broad range of purified kinases—making it ideal for both primary screening as well as kinase selectivity profiling. The ADP-Glo™ Kinase Assay can be used to monitor the activity of virtually any ADP-generating enzyme (e.g., kinase or ATPase) using up to 1mM ATP.

Features:

- **Fast Turnaround Time:** Lead compounds can be profiled in-house in a matter of hours versus days when compounds are sent out.
- **Flexible Kinase Inhibitor Profiling:** Each system has enough material to profile up to twenty compounds at a single dose or create a dose-response for two compounds against the eight kinases at once.
- **Fast and Simple Reaction Assembly:** Two quick dilutions provide working stocks of kinases and substrate/cofactor solutions.
- **Optimized Kinase Activity for Inhibitor Profiling:** All kinases have been optimized to provide 10–30% ADP production when assayed at 10µM ATP.
- **Formatted Strips Provide Access to Eight Kinases at One Time:** Kinases from singular kinase families are grouped together for a more relevant selectivity profile.
- **Accurate:** Accurately measure ADP levels at a wide range of starting ATP concentrations; activity measured truly reflects kinase activity and produces accurate IC_{50} values comparable to radioactivity-based assays.
- **Stable Luminescent Signal:** Perform batch plate processing without need for strictly timed incubations; flexible.

Storage Conditions: Store the Kinase Selectivity Profiling Systems below –65°C. Before use, thaw 5X Reaction Buffer A and 0.1M DTT at room temperature, and thaw the Substrate/Co-Factor Strip on ice. Immediately before use, thaw the Kinase Strip on ice, dilute and use immediately. After use, discard any remaining Kinase Working Stock and Substrate/Co-Factor Working Stock. Store any remaining 5X Reaction Buffer A and 0.1M DTT at –20°C for future use with the second Kinase Strip and Substrate/Co-Factor Strip.

Available in the Helix® on-site stocking system

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Available in the Helix® on-site stocking system

Lipid Kinase Assays and Reagents

Product	Size	Cat.#
PI3K-Glo™ Class I Profiling Kit	1 each	V1690
ADP-Glo™ Kinase Assay with PI:3PS	1,000 assays	V1781
	10,000 assays	V1782
ADP-Glo™ Kinase Assay with PIP2:3PS	1,000 assays	V1791
	10,000 assays	V1792
Available Separately		
PI3K (p110α/p85α), 20µg	200 µl	V1721
PI3K (p110α[E545K]/p85α), 20µg	200 µl	V1731
PI3K (p110α[H1047R]/p85α), 20µg	200 µl	V1741
PI3K (p110β/p85α), 20µg	200 µl	V1751
PI3K (p120γ), 20µg	200 µl	V1761
PI3K (p110δ/p85α), 20µg	200 µl	V1771
PIP2:3PS Lipid Kinase Substrate, 0.25mg	0.25 ml	V1701
PI:3PS Lipid Kinase Substrate, 0.5mg	0.5 ml	V1711

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Description: Phosphatidylinositol (PI) and its phosphorylated derivates, collectively called phosphoinositides, are important second messengers that are critical as signaling molecules and for cellular membrane remodeling. These derivatives are generated by a family of kinases called phosphoinositide lipid kinases (PIKs). Nineteen PIK isoforms have been identified in mammals. Based on their ability to preferentially phosphorylate the hydroxyl group of the inositol ring on position 3, 4 or 5, they have been broadly classified into three major families: phosphoinositide 3-kinases (PI3Ks), phosphoinositide 4-kinases (PI4Ks) and phosphoinositide phosphate-kinases (PIP5Ks and PIP4Ks).

Promega lipid kinase enzymes, substrates and detection systems provide a complete set of reagents for performing phosphoinositide lipid kinase (PIK) reactions using a luminescent ADP-detection platform, the ADP-Glo™ Kinase Assay. The reagents include purified human recombinant proteins of Class I PI3Ks, optimized reaction buffer and ready-to-use lipid kinase substrates. The enzymes are available separately or can be purchased as part of the **PI3K-Glo™ Class I Profiling Kit**, which contains PI3Ks (α, β, γ and δ; 5µg each), PIP2:3PS Lipid Kinase Substrate (0.25mg) and the ADP-Glo™ Kinase Assay, 1,000 assays. The lipid substrates are supplied as frozen small unilamellar vesicles containing a mixture of phosphatidylinositol (PI) or phosphoinositol-4,5-bisphosphate (PIP2) at a 1:3 ratio with phosphatidylserine (PS) as carrier lipid. A substrate composed of PIP2 and PS at a 1:3 ratio was optimized to use with class I PI3Ks. A substrate composed of PI and PS at a 1:3 ratio was demonstrated to be recognized by the majority of family members and provides a universal PI lipid kinase substrate.

The lipid kinase reaction is performed by incubating lipid substrate (PI:3PS or PIP2:3PS) with a recombinant enzyme and ATP, and the kinase activity is measured using the ADP-Glo™ Kinase Assay. The ADP-Glo™ Kinase Assay is performed in two steps. After the kinase reaction, an ATP-depletion reagent is added to terminate the lipid kinase reaction and deplete any remaining ATP, leaving only ADP. Next, a detection reagent is added to simultaneously convert ADP to ATP and allow the newly synthesized ATP to be converted to light using a coupled luciferase/luciferin reaction.

Features:

Employ Complete Solutions for Class I PI3Ks:

- Purified human recombinant enzymes with high specific activity.
- Ready-to-use lipid substrate (PI or PIP2).
- Universal reaction buffer formulation.
- Highly sensitive detection assay.

Observe Excellent Selectivity: High signal-to-background ratios even at low % conversion of substrate.

Obtain Reliable Results: The broad dynamic range, low background and excellent sensitivity result in less ambiguous data.

Save Time: Homogeneous assay with simple "add-and-read" format.

Avoid False Hits: The special formulation and luminescent signal results in low false-hit rate.

Save Money: Easily scalable to 1,536-well format, reducing cost per well.

Storage Conditions: Recombinant PI3K Enzymes: Store recombinant PI3K enzymes below –65°C. At first use, rapidly thaw and place on ice. Dispense any unused material into single-use aliquots and immediately snap-freeze the vials. Avoid multiple freeze-thaw cycles. **Lipid Substrates:** Store lipid substrates below –65°C. Before use, thaw at room temperature and allow substrate to equilibrate completely to room temperature. Mix extensively by vortexing for at least 1 minute. Thawed lipid substrates can be kept at room temperature (15–30°C) for at least 6 hours or stored at 2–10°C for one week.**Buffers:** Store 5X PI3K Reaction Buffer, 10X Lipid Dilution Buffer and 1M $MgCl_2$ at –30°C to –10°C. **ADP-Glo™ Kinase Assay:** Upon receiving ADP-Glo™ Kinase Assay, remove ATP and store it below –65°C. Store the rest of the components at –30 to –10°C. Before use, thaw all components completely at room temperature. Once thawed, mix each component thoroughly before use. Because ATP is naturally prone to hydrolysis after freeze-thaw cycles, dispense into single-use aliquots and store below –65°C. Once thawed and prepared, dispense Kinase Detection Reagent (Kinase Detection Buffer + Substrate) and ADP-Glo™ Reagent into aliquots and store at –30 to –10°C. For convenience, both reagents may be used at room temperature for 24 hours without loss of signal.

ADP-Glo™ Kinase Assay

Product	Size	Cat.#
ADP-Glo™ Kinase Assay	400 assays	V6930
	1,000 assays	V9101
	10,000 assays	V9102
	100,000 assays	V9103
ADP-Glo™ Kinase Assay, Bulk Packaged	100,000 assays	V9104

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Description: ADP-Glo™ Kinase Assay is a luminescent kinase assay that measures ADP formed from a kinase reaction; ADP is converted into ATP, which is converted into light by Ultra-Glo™ Luciferase. The luminescent signal positively correlates with kinase activity. The assay is well suited for measuring the effects chemical compounds have on the activity of a broad range of purified kinases, making it ideal for both primary screening as well as kinase selectivity profiling. The ADP-Glo™ Kinase Assay can be used to monitor the activity of virtually any ADP-generating enzyme (e.g., kinase or ATPase) using up to 1mM ATP.

The assay is performed in two steps; first, after the kinase reaction, an equal volume of ADP-Glo™ Reagent is added to terminate the kinase reaction and deplete the remaining ATP. In the second step, the Kinase Detection Reagent is added, which simultaneously converts ADP to ATP and allows the newly synthesized ATP to be measured using a coupled luciferase/luciferin reaction.

The ADP-Glo™ Kinase Assay has a high dynamic range and produces a strong signal at low ATP to ADP conversion, making it well suited for screening low activity kinases such as growth factor receptor tyrosine kinases. The assay produces minimal false hits and Z′ values of greater than 0.8.

Features:

- **High Signal Strength at Low ATP Conversion:** Users can measure kinase activity that more closely mimics physiological conditions. This makes the assay very well suited for low-activity kinases such as receptor tyrosine kinases.
- **Sensitive:** The assay is sensitive to low concentrations of ADP, thus requiring less enzyme than other assays; cost savings.
- **Universal:** The assay can be used with virtually with any kinase—enables researchers to screen a wider range of kinases in-house, reducing dependency on costly outsourcing of kinase selectivity profiling.
- **Accurate:** Accurately measures ADP levels at a wide range of starting ATP concentrations; users assured that activity measured truly reflects kinase activity and produces accurate IC_{50} values comparable to radioactivity-based assays.
- **Accommodate Wide Range of ATP Levels:** The assay can be used at ATP concentrations up to 1mM, important for kinases with high K_m values for ATP.
- **Stable Luminescent Signal:** Users can perform batch plate processing without need for strictly timed incubations; flexible.

Storage Conditions: Store the system at –20°C. Before use, thaw all reagents completely at room temperature. Once thawed, components should be thoroughly mixed before use. Once prepared, the Kinase Detection Reagent (Kinase Detection Buffer + Substrate) should be divided into aliquots and stored at –20°C.

Kinase-Glo® Luminescent Kinase Assays

Product	Size	Cat.#
Kinase-Glo® Luminescent Kinase Assay	10 ml	V6711
	10 × 10 ml	V6712
	100 ml	V6713
	10 × 100 ml	V6714
Kinase-Glo® Max Luminescent Kinase Assay	10 ml	V6071
	10 × 10 ml	V6072
	100 ml	V6073
	10 × 100 ml	V6074
Kinase-Glo® Plus Luminescent Kinase Assay	10 ml	V3771
	10 × 10 ml	V3772
	100 ml	V3773
	10 × 100 ml	V3774

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Description: The Kinase-Glo® Luminescent Kinase Assays are homogeneous non-radioactive methods for determining the activity of purified kinases by quantifying the amount of ATP remaining in solution following a kinase reaction. The assays are designed for use with multiwell plate formats, making them ideal for automated high-throughput screening (HTS), and they can be used to assay protein, lipid and sugar kinases. The assay procedure involves addition of a single reagent directly to a completed kinase reaction. This addition results in the generation of a luminescent signal correlated with the amount of ATP present and inversely proportional to the amount of kinase activity. The Kinase-Glo® Assays generate a "glow-type" luminescent signal produced using a patented stabilized luciferase (Ultra-Glo™ Luciferase) coupled with a proprietary buffer system. When assayed in the presence of kinase reaction buffers, such as the reaction buffer for PKA, the half-life of the luminescent output is greater than five hours, eliminating the need for luminometers with injectors and enabling batch plate processing. The assay produces excellent Z′-factor values of greater than 0.7 in 96- and 384-well formats, easily detects known kinase inhibitors and provides IC_{50} values comparable to those reported in the literature.

The Kinase-Glo® Assay systems are differentiated by their linear response to ATP. The original Kinase-Glo® Assay is linear to 10µM ATP, while Kinase-Glo® Plus Assay is linear to 100µM ATP. The newest assay, Kinase-Glo® Max, is linear to 500µM ATP, making it well suited for use with kinases with high K_m for ATP as well as for screening for kinase inhibitors that do not compete at the ATP binding site.

Features:

- **Assay a Variety of Kinases:** Can be used for a wide range of kinases (including lipid, sugar and alcohol kinases) and substrates (peptides, proteins, lipids, sugars and alcohols).
- **Obtain Reliable Results:** Luminescence is much less susceptible to interference from library compounds than other luciferase-based ATP detection reagents. Z′-factor values greater than 0.7 in either 96- or 384-well plate formats.
- **Simplify Your Assay:** Homogeneous—everything is performed in a single well.
- **Non-Radioactive:** No radioactive waste disposal and safety issues.
- **Automate This Assay:** Validated automated methods available at: **www.promega.com/automethods/**
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**
- **Screen for Non-ATP Binding Site Inhibitors:** Use ATP concentrations as high as 500µM (Kinase-Glo® Max Assay).

Storage Conditions: Store at –20°C. Avoid multiple freeze-thaw cycles and exposure to frequent temperature changes. These fluctuations can greatly alter product stability.

Available in the Helix® on-site stocking system

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SAM²® Biotin Capture Membrane

Product	Size	Cat.#
SAM²® Biotin Capture Membrane	96 samples	V2861

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The SAM²® Biotin Capture Membrane binds biotinylated molecules based on their affinity for streptavidin. The proprietary process by which the SAM²® Membrane is produced results in a high density of streptavidin on the filter, providing rapid, quantitative substrate binding in the nmol/cm² range, depending upon the substrate used. In addition, the membrane is designed to minimize nonspecific binding. The membrane is available as a large, prenumbered, partially cut sheet (approximately 10.5 × 15.0cm. The partially cut membrane allows easy separation into 96 individual squares and is designed for small-scale experiments where high binding capacity is required. The membrane may be analyzed using phosphorimaging analysis, autoradiography or scintillation counting to quantitate results. The membrane was also used successfully with chemiluminescence detection techniques. The use of fluorescence for detection of captured molecules is not recommended at this time.

Features:

- **Use a Variety of Substrates:** Analysis of biotinylated substrates can be applied to a wide variety of substrate types without the need to optimize each substrate for binding to a matrix. The user can perform experiments with a wide array of sample numbers without changing the analysis technique, since the membrane is available as a 96-square (partially cut) sheet.
- **Minimize Nonspecific Binding:** The combination of protein denaturant and high-salt washes minimizes nonspecific binding to the membrane without interfering with the high-affinity interaction between streptavidin and biotin.
- **Obtain High Signal-to-Noise Ratios:** The stringent washing conditions employed assist in attaining very low background counts.
- **Perform Kinetic Studies:** Membrane can linearly bind biotinylated substrates up to the nmol/cm² range, allowing kinetic studies.
- **Strong Binding Reaction:** Membrane retains the biotin conjugate over 8 logs of pH (pH 2–10), changes in temperature, organic solvents, ionic and nonionic detergents (SDS, CHAPS, Triton® X-100, Tween® 20 and Tween® 80) and denaturing agents (5M guanidine-HCl and 2M urea).
- **Rapid:** Binds within 1 minute.
- **Convenient:** Compatible with enzyme assays using radioactive detection. Membranes manufactured by this method have been shown to allow chemiluminescent detection.

Storage Conditions: Store membranes at –20°C in resealable bag.

SignaTECT® Protein Kinase Assay Systems

Product	Size	Cat.#
SignaTECT® Protein Kinase C (PKC) Assay System	96 reactions	V7470
SignaTECT® Protein Tyrosine Kinase (PTK) Assay System	96 reactions	V6480
SignaTECT® Calcium/Calmodulin-Dependent Protein Kinase (CaM KII) Assay System	96 reactions	V8161
SignaTECT® DNA-Dependent Protein Kinase Assay System	96 reactions	V7870

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Description: The SignaTECT® Protein Kinase Assay Systems contain the proprietary SAM²® Biotin Capture Membrane, which offers significant advantages over other radioactive technologies for assaying protein kinases. The streptavidin-coated SAM²® Membranes possess high binding capacity and high specificity characteristics, which produce lower backgrounds and higher signal-to-noise ratios compared to the traditional P81 phosphocellulose method of capture and measurement. The perforated and numbered membrane allows researchers to measure from 1 up to 96 kinase reactions. The SAM²® Membrane format does not require as much "hands-on" manipulation as other methods used to measure kinase activity. Following the kinase reaction, samples are spotted onto the SAM²® Membrane, and a series of short wash steps are performed to remove nonspecific label. The process is complete in less than 1 hour. In addition, the nature of the SAM²® Membrane allows it to be used under a variety of buffer/reaction conditions (e.g., cell extracts), which many other methods do not allow. Lastly, the high binding capacity allows use of the SignaTECT® Systems for kinetic studies.

Each system contains highly specific biotinylated peptide substrates for the appropriate kinase as well as the necessary reaction components. The researcher must supply [γ-^{32}P]ATP.

Storage Conditions: Store all SignaTECT® Systems except V7470 at –20°C. Store Cat.# V7470 at –70°C.

PepTag® Non-Radioactive cAMP-Dependent Protein Kinase Assays

Product	Size	Cat.#
PepTag® Non-Radioactive cAMP-Dependent Protein Kinase Assay	120 reactions	V5340

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The PepTag® Non-Radioactive cAMP-Dependent Protein Kinase Assay System provides a rapid, sensitive and non-radioactive method to detect Protein Kinase A (PKA) activity. The PepTag® Assay uses brightly colored, fluorescent peptide substrates that are highly specific for PKA (PepTag® A1 Peptide-LRRASLG). Phosphorylation of the peptide alters the net charge from +1 to –1. This change in the net charge allows the phosphorylated and nonphosphorylated versions of the substrate to be rapidly separated on an agarose gel at neutral pH. Using fluorescent detection, less than 2ng of purified kinase can be detected in less than 2 hours. The PepTag® Non-Radioactive cAMP-Dependent Protein Kinase Assay System can detect kinase activity in partially purified samples as well as purified preparations of enzymes, making it a good choice for the rapid screening of column fractions or the screening of kinase activators and inhibitors. In addition to the assay components, the system includes purified kinase for use as a positive control.

Features:

- **Non-Radioactive:** The fluorescent tag on the peptide substrate facilitates quantitation of the phosphorylation reaction without the use of radioactivity.
- **Low Background:** Because the phosphorylation of the colored peptide supplied with the system is used to measure kinase activity, phosphorylation of other substrates occurring naturally in the sample does not add to the kinase activity measured.
- **Convenient:** Quantitation of the phosphorylated peptide can be accomplished using a densitometer, spectrophotometer, 96-well plate reader or fluorometer.

Storage Conditions: Store at –70°C.

cAMP-Dependent Protein Kinase, Catalytic Subunit

Product	Size	Conc.	Cat.#
cAMP-Dependent Protein Kinase, Catalytic Subunit	2,500 u	1.5–3 mg/ml	V5161

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The purified 40kDa cAMP-Dependent Protein Kinase (PKA), Catalytic Subunit, may be used to phosphorylate target proteins or for in vitro enzymological studies of neural and hormonal signal transduction. Intracellular targets include ion channels, transcriptional activator proteins, and regulatory enzymes of glycogen metabolism.

Features:

- **Highly Pure:** The PKA Catalytic Subunit has been purified from a recombinant *E. coli* strain expressing the catalytic subunit of bovine PKA and is 90% pure.

Storage Conditions: Store at –70°C.

DNA-Dependent Protein Kinase

Product	Size	Cat.#
DNA-Dependent Protein Kinase	2,500 u	V5811

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: DNA-Dependent Protein Kinase (DNA-PK) phosphorylates several DNA-binding substrates in vitro, including the tumor suppressor protein p53, the SV40 large T antigen and several transcription factors. DNA-PK is thought to play a role in controlling gene regulation and cell growth.

DNA-PK is isolated from HeLa nuclear extracts as a complex consisting of a 400kDa catalytic subunit and a 155kDa heterodimeric DNA-binding component named Ku, which itself consists of subunits of approximately 85kDa and 70kDa.

Storage Conditions: Store at –70°C.

Anti-ACTIVE® JNK pAb, Rabbit, (pTPpY)

Product	Size	Cat.#
Anti-ACTIVE® JNK pAb, Rabbit, (pTPpY)	40 µl	V7931
	120 µl	V7932

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For additional information see page 69.

Anti-ACTIVE® MAPK pAb, Rabbit, (pTEpY)

Product	Size	Cat.#
Anti-ACTIVE® MAPK pAb, Rabbit, (pTEpY)	40 µl	V8031

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For additional information see page 69.

Protein Kinase Inhibitors and Activators

Product	Size	Cat.#
MEK Inhibitor U0126	5 mg	V1121
InCELLect™ AKAP St-Ht31 Inhibitor Peptide	150 µl	V8211
InCELLect™ St-Ht31P Control Peptide	150 µl	V8221
LY 294002	5 mg	V1201
PMA	5 mg	V1171
cGMP, 1mM	500 µl	V6411
cAMP, 1mM	500 µl	V6421

V1121, V8211, V8221, V1201, V1171 For Research Use Only. Not for Use in Diagnostic Procedures. V6411, V6421 For Laboratory Use.

Protein Kinase Substrates

Product	Size	Conc.	Cat.#
Kemptide (PKA) Peptide Substrate	1 mg	10 mg/ml	V5601
DNA-Dependent Protein Kinase Peptide Substrate	1 mg	10 mg/ml	V5671

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Available in the Helix® on-site stocking system

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Signaling Pathway Assays

UDP-Glo™ Glycosyltransferase Assay

Product	Size	Cat.#
UDP-Glo™ Glycosyltransferase Assay	200 assays	V6961
	400 assays	V6962
	4,000 assays	V6963
UDP-Glo™ Glycosyltransferase Assay + UDP-GlcNAc	200 assays	V6971
	400 assays	V6972
UDP-Glo™ Glycosyltransferase Assay + UDP-GalNAc	200 assays	V6981
	400 assays	V6982
UDP-Glo™ Glycosyltransferase Assay + UDP-Glucose	200 assays	V6991
	400 assays	V6992
UDP-Glo™ Glycosyltransferase Assay + UDP-Galactose	200 assays	V7051
	400 assays	V7052
UDP-Glo™ Glycosyltransferase Assay + UDP-Glucuronic Acid (UDP-GA)	200 assays	V7061
	400 assays	V7062

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The UDP-Glo™ Glycosyltransferase Assay is a bioluminescent assay for detecting the activity of glycosyltransferases that use UDP-sugars as donor substrates and release UDP as a product. Glycosylation reactions catalyzed by glycosyltransferases are central to many biological processes, including cell:cell interactions, cell signaling and bacterial cell wall biosynthesis. Glycosyltransferases transfer sugar from a nucleotide-glycosyl donor (e.g., UDP-Galactose, UDP-Glucose, UDP-GlcNAc, UDP-GalNAc and UDP-Glucuronic Acid) to an acceptor molecule. In a glycosyltransferase reaction, the UDP moiety is released as a product; therefore, an assay that detects UDP would be suitable for monitoring the activity of the majority of glycosyltransferases.

The UDP-Glo™ Glycosyltransferase Assay is a homogeneous, single-reagent-addition method to rapidly detect UDP formation in glycosyltransferase reactions. After the glycosyltransferase reaction, an equal volume of UDP Detection Reagent is added to simultaneously convert the UDP product to ATP and generate light in a luciferase reaction. The light generated is detected using a luminometer. Luminescence can be correlated to UDP concentration by using an UDP standard curve.

This assay is intended for use with purified glycosyltransferases that use UDP-sugar as a donor substrate and cannot be used with whole cells or cell extract. However, glycosyltransferases can be purified from cell extract using immunoprecipitation or affinity tag pull down then used in the UDP-Glo™ Glycosyltransferase Assay.

Note: The UDP-Glo™ Glycosyltransferase Assay kits have changed from their original component configuration. The UDP-Glo™ Solution, a component of the original kits, was replaced with 1) UDP-Glo™ Enzyme and 2) Enzyme Dilution Buffer. The technical manual (#TM413) has instructions for preparing the UDP Detection Reagent. Also, note the change in the kit storage temperature from –20°C to less than –65°C.

Features:

- **Universal Assay:** Use any UDP-sugar-utilizing glycosyltransferase and glycosyltransferase:substrate combination, including peptide, protein, lipid and sugar substrates.
- **High Dynamic Range:** High signal-to-background ratios at lower concentrations of UDP means using less enzyme during the glycosyltransferase reaction.
- **High Sensitivity:** Detect 0.1–0.5pmol of UDP with a more than twofold difference over background.
- **Linear Response in the Nanomolar to Micromolar Range:** Use low concentrations of UDP-sugar, decreasing feedback glycosyltransferase inhibition issues.
- **Reliable, Reproducible Data:** Routinely obtain Z′ factor values >0.7 even with low UDP production rates.
- **Luminescence-Based UDP Detection:** Experience less overall assay interference from chemical compounds.
- **Batch Plate Processing:** Highly stable luminescent signal with >80% signal remaining after 3 hours.

Storage Conditions: Store the UDP-Glo™ Glycosyltransferase Assay at less than –65°C or store UDP-Glo™ Enzyme at less than –65°C and the other components at –20°C. Before use, completely thaw all components at room temperature except the UDP-Glo™ Enzyme, which should be thawed only prior to use, returning any remaining volume to less than –65°C. Once thawed, all components should be thoroughly mixed before use. Any remaining Nucleotide Detection Reagent (Nucleotide Detection Buffer + ATP Detection Substrate) should be dispensed into aliquots and stored at less than –65°C. For best results, prepare only the amount of UDP Detection Reagent (Nucleotide Detection Reagent + UDP-Glo™ working solution) needed. If smaller amounts of UDP Detection Reagent are needed for each use, the UDP-Glo™ Solution should be dispensed into single-use aliquots and stored at less than –65°C.

Ultra Pure UDP Sugar Substrates

Product	Size	Cat.#
Ultra Pure UDP-GlcNAc, 100 mM	50 µl	V7071
	5 × 50 µl	V7072
Ultra Pure UDP-GalNAc, 100 mM	50 µl	V7081
	5 × 50 µl	V7082
Ultra Pure UDP-Glucose, 100 mM	50 µl	V7091
	5 × 50 µl	V7092
Ultra Pure UDP-Galactose, 100 mM	50 µl	V7171
	5 × 50 µl	V7172
Ultra Pure UDP-Glucuronic Acid (UDP-GA), 100 mM	50 µl	V7321
	5 × 50 µl	V7322

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: UDP-GlcNAc, UDP-GalNAc, UDP-Glucose, UDP-Galactose and UDP-Glucuronic Acid are ultra-pure UDP-sugar substrates designed for use with the UDP-Glo™ Glycosyltransferase Assay—a bioluminescent assay for detecting the activity of glycosyltransferases that use UDP-sugars as donor substrates.

Glycosylation reactions catalyzed by glycosyltransferases are central to many biological processes, including cell:cell interactions, cell signaling and bacterial cell wall biosynthesis. Glycosyltransferases transfer sugar from a nucleotide-glycosyl donor (e.g., UDP-Galactose, UDP-Glucose, UDP-GlcNAc, UDP-GalNAc and UDP-Glucuronic Acid) to an acceptor molecule. In a glycosyltransferase reaction, the UDP moiety is released as a product; therefore, an assay that detects UDP can be used to monitor the activity of the majority of glycosyltransferases.

Storage Conditions: Store at less than –65°C.

AMP-Glo™ Assay

Product	Size	Cat.#
AMP-Glo™ Assay	1,000 assays	V5011
	10,000 assays	V5012

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The AMP-Glo™ Assay is a homogeneous assay that generates a luminescent signal from any biochemical reaction that produces AMP as a reaction product. This versatile system can measure the activity of a broad range of enzymes, such as cyclic AMP-specific phosphodiesterases, aminoacyl-tRNA synthetases, DNA ligases and ubiquitin ligases or enzymes modulated by AMP. The AMP-Glo™ Assay is designed to quantitatively monitor the concentration of AMP in a biochemical reaction in a wide range of plate formats, including high-throughput formats. The stable luminescent signal of the assay eliminates the need for an injector-equipped luminometer and enables batch-mode processing of multiple plates. The assay can be used to determine the AMP produced either in the presence or absence of ATP as a substrate.

The assay contains two reagents: one to terminate the AMP-generating enzymatic reaction and simultaneously remove ATP and convert AMP produced into ADP, and a second reagent that converts the ADP to ATP followed by conversion of the ATP into a luminescent signal using the luciferin/luciferase reaction. The assay also is well suited for monitoring AMP produced in biochemical reactions catalyzed by enzymes that do not use ATP as a substrate, such as cAMP-dependent phosphodiesterases (PDE) and bacterial DNA ligases.

The AMP-Glo™ Assay has a high dynamic range and produces a strong signal at low substrate conversion, making it well suited for screening low activity enzymes. The assay produces minimal false hits and Z´ values greater than 0.7.

Features:

- **High Signal Strength at Low Substrate Conversion:** Measure enzyme activity that more closely mimics physiological conditions—very well suited for low-activity enzymes.
- **Sensitive to Low Concentrations of AMP:** Requires less enzyme than other assays; cost savings.
- **Universal:** Use the assay with virtually with any AMP-producing enzyme—enables screening of a wider range of enzymes using a single platform.
- **Accurately Measures AMP Levels at a Wide Range of Starting Substrate Concentrations:** Activity measured truly reflects enzyme activity and is well suited for measuring the effects of inhibitor on enzyme activity.
- **Luminescent Readout:** Much less susceptible to interference from library compounds than fluorescent-based methods.

Storage Conditions: Store the system at –30 to –10°C. Before use, thaw all components completely at room temperature, except for the AMP-Glo™ Reagent II, which should be kept on ice after thawing. Once thawed, mix all components thoroughly before use. Once prepared, the Kinase-Glo® One Solution should be dispensed into aliquots and stored at –20°C. See the product label for expiration date.

Available in the Helix® on-site stocking system

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ADP-Glo™ Max Assay

Product	Size	Cat.#
ADP-Glo™ Max Assay	1,000 assays	V7001
	10,000 assays	V7002

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ADP-Glo™ Max Assay is a luminescent ADP detection assay that provides a universal, homogeneous, high-throughput screening method to measure ATPase or kinase activity by quantifying the amount of ADP produced in a reaction. The assay can be used to monitor the activity of virtually any ADP-generating enzyme (e.g., kinase or ATPase) when higher ATP concentration is required (up to 5mM). The ADP-Glo™ Max Assay produces a strong signal that positively correlates with enzyme activity and can be adapted to a multitude of plate formats.

The assay is performed in two steps: first, after the completion of the ADP-producing reaction, an equal volume of ADP-Glo™ Reagent is added to terminate the reaction and deplete the remaining ATP. Second, the ADP-Glo™ Max Detection Reagent is added to simultaneously convert ADP to ATP, and the latter is converted to light in a coupled reaction with luciferase/luciferin.

The ADP-Glo™ Max Assay has a high dynamic range and produces a strong signal at low ATP to ADP conversion, making it well suited for screening low-activity ATPases such as drug membrane transporters and heat shock proteins. The assay produces minimal false hits and Z′ values of greater than 0.7.

Features:

- **High Signal Strength at Low ATP Conversion:** Users can measure enzyme activity that more closely mimics physiological conditions. This makes the assay very well suited for low-activity ATPases/kinases.
- **Sensitive:** The assay is sensitive to low concentrations of ADP, thus requiring less enzyme than other assays; cost savings.
- **Universal:** The assay can be used with virtually with any ADP-producing enzyme—enables researchers to screen a wider range of enzymes using a single platform.
- **Accommodate Wide Range of ATP Levels:** The assay can be used at ATP concentrations up to 5mM, important for enzymes with high K_m values for ATP and for mode of action studies.
- **Accurate:** Accurately measures ADP levels at a wide range of starting ATP concentrations; users assured that activity measured truly reflects enzyme activity and produces accurate IC_{50}s comparable to radioactivity-based assays.

Storage Conditions: Store the system at –20°C. Before use, thaw all components completely at room temperature. Once thawed, mix all components thoroughly before use. Because ATP is naturally prone to hydrolysis after freeze-thaw cycles dispense into single-use aliquots and store at –20°C. Once prepared, dispense, ADP-Glo™ Max Detection Reagent (ADP-Glo™ Max Detection Buffer + Substrate) into aliquots and store at –20°C. ADP-Glo™ Max Detection Buffer may form a precipitate when thawed. See Section 3.A of the Technical Manual for a protocol to dissolve any precipitate. For convenience, ADP-Glo™ Reagent and ADP-Glo™ Max Detection Reagent may be kept at room temperature (22°C) for 24 hours without loss of signal.

Non-Radioactive Phosphatase Assay Systems

Product	Size	Cat.#
Serine/Threonine Phosphatase Assay System	96 reactions	V2460
Tyrosine Phosphatase Assay System	96 reactions	V2471

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Description: The Non-Radioactive Phosphatase Assay Systems provide a fast, convenient and flexible alternative for measuring protein phosphatase activity. These systems determine the amount of free phosphate generated in a reaction by measuring the absorbance of a molybdate:malachite green:phosphate complex. These systems allow the use of a variety of buffer conditions and substrates, including naturally phosphorylated proteins or synthetic phosphopeptides. The Serine/Threonine Phosphatase Assay System contains the chemically synthesized phosphopetide, RRA(pT)VA, a peptide substrate that is compatible with several serine/threonine phosphatases such as the Protein Phosphatases 2A, 2B, and 2C. **However the supplied phosphopeptide is a poor substrate for Protein Phosphatase 1 because of its more stringent structural requirements.**

The Tyrosine Phosphatase Assay System contains two chemically synthesized phosphopeptides, END(pY)INASL and DADE(pY)LIPQQG, that serve as substrates for many protein tyrosine phosphatases. The effective range for the detection of phosphate released during an assay using the Phosphatase Assay Systems is 100–4,000pmol of phosphate. In addition to measuring phosphatase activity in partially fractionated and purified samples, the Phosphatase Assay Systems can also measure phosphatase activity in crude cell or tissue extracts. For this application, the high concentration of phosphate in these preparations is eliminated prior to performing the assay using the supplied Spin Columns, which rapidly and effectively remove free phosphate and other low-molecular-weight inhibitors from the sample. In addition, a unique Molybdate Dye Additive that is combined with the Molybdate Dye Solution aids in the solubilization of proteins exposed to the acid conditions of the Molybdate Dye Solution, which alone could potentially cause precipitation of the proteins.

Storage Conditions: Store the entire kit at 4°C.

rhTNF-α

Product	Size	Cat.#
rhTNFα	10 µg	G5241
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Tumor Necrosis Factor-α, Human, Recombinant (rhTNF-α), is a pleiotropic cytokine produced predominantly by activated monocytes/macrophages. Biological effects of this molecule include induction of apoptosis, cytolysis or cytostasis of tumor cells, activation of polymorphonuclear leukocytes, antiviral activity and induction of IL-1 or colony-stimulating factor expression. rhTNF-α is a 17kDa protein containing 157 amino acid residues that is produced from a recombinant DNA expressed in *E. coli.*

Nerve Growth Factor, 2.5S, Murine

Product	Size	Cat.#
mNGF, 2.5S	100 µg	G5141
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Murine 2.5S Nerve Growth Factor (2.5S mNGF) mediates phosphorylation of specific intracellular proteins. Target cells of this molecule include sympathetic and sensory neurons and derivatives of nerve cells such as adrenal medulla pheochromocytoma (PC12) cells. 2.5S mNGF is a 26kDa protein composed of two identical 118 amino acid chains. Murine 2.5S Nerve Growth Factor is purified from male mouse submaxillary glands by the method of Bocchini and Angeletii.

Activity: 2.5S mNGF exhibits an ED_{50} value below 2ng/ml using a PC-12 serum-free survival assay.

Storage Conditions: Store lyophilized Murine 2.5S NGF desiccated at –20°C, where it is stable for at least six months from the date of purchase. Store reconstituted Murine 2.5S NGF in working aliquots at –20°C, where it is stable for up to 6 months. Avoid multiple freeze-thaw cycles.

rhFGF, Basic

Product	Size	Cat.#
rhFGF, Basic	25 µg	G5071
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Fibroblast Growth Factor, Basic, Human, Recombinant (rhFGF, Basic), is a 17.5kDa polypeptide containing 154 amino acids. It induces proliferation of multiple types of cells in vitro and demonstrates potent angiogenic activity in vivo. rhFGF, Basic, is produced from recombinant DNA expressed in *E. coli.*

Epidermal Growth Factor, Human, Recombinant

Product	Size	Cat.#
rhEGF	100 µg	G5021
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Epidermal Growth Factor, Human, Recombinant (rhEGF) is a 6.2kDa protein that is mitogenic for a variety of mammalian cell types. rhEGF is produced from recominbant DNA expressed in *E. coli.*

Activity: rhEGF exhibits an ED_{50} value below 0.2ng/ml in the serum-free BALB/3T3 bioassay using the CellTiter 96® Non-Radioactive Cell Proliferation Assay.

Storage Conditions: Store lyophilized product at –20°C. Rehydrated rhEGF is stable for 3 months at –20°C. Avoid repeated freeze-thaw cycles. When stored and handled properly, lyophilized rhEGF is stable for at least 6 months from the date of purchase.

Available in the Helix® on-site stocking system

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Nuclear Receptor Analysis Luciferase Vectors

Product	Size	Cat.#
pGL4.36[*luc2P*/MMTV/Hygro] Vector	20 µg	E1360
pFN26A (BIND) *hRluc*-neo Flexi® Vector	20 µg	E1380
pBIND-ERα Vector	20 µg	E1390
pBIND-GR Vector	20 µg	E1581
pGL4.35[*luc2P*/9X*GAL4*UAS/Hygro] Vector	20 µg	E1370

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Nuclear receptor analysis can be performed with traditional means, using a minimal promoter vector with nuclear receptor response elements upstream. Alternatively, you can use viral elements like the mouse mammary tumor virus long terminal repeat promoter to judge androgen or glucocorticoid responses (e.g., pGL4.36). In many cases, use of these methods requires a cell line with the appropriate endogenous nuclear receptors, meaning you may need different cell lines for each nuclear receptor study. A method using the principles of the yeast two-hybrid system was adapted for nuclear receptor work. The nuclear receptor ligand binding domain is fused to the GAL4 DNA binding domain and transfected with a firefly luciferase vector containing repeats of the GAL4 upstream activation sequence upstream of a minimal promoter. The ligand binding domain is responsible for ligand binding, homo- or heterodimerization and interactions with co-activator or co-repressors. The one-hybrid method allows you work with any cell line and nuclear receptor you desire.

Features:

- **Robust:** GAL4-based system removes background signals from endogenous receptors.
- **More Sensitive:** Optimized 9X Gal4 gives improved responses, better signal:noise ratio.
- **Adaptable:** Combination *Renilla*/Neomycin marker allows normalization with Dual-Luciferase® Assay or selectable markers for generating stable cell lines, all with one vector.
- **Consistent:** Compare or profile all nuclear receptors with a single experimental system.
- **Faster Results:** Destabilized and optimized *luc2P* luciferase gene allows greater sensitivity and shorter induction times.

Storage Conditions: Store at –20°C.

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Metabolite Detection Assays

Glucose-Glo™ Assay

Product	Size	Cat.#
Glucose-Glo™ Assay	5 ml	J6021
	50 ml	J6022

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Glucose-Glo™ Assay is a bioluminescent assay for rapid and sensitive measurement of glucose from a variety of sample types. The bioluminescent signal eliminates signal interference that colorimetric and fluorescent glucose assays suffer, and there is no need for deproteinization sample preparation steps. The Glucose-Glo™ Assay is suitable for detecting altered glucose consumption due to changes in glycolysis or glucose production during gluconeogenesis.

Features:

- Measure glucose in a variety of sample types.
- Limit of detection down to nM range.
- Signal to background >1,000.

Storage Conditions: Store complete kits at less than –65°C. Alternatively, store the Reductase Substrate at less than –65°C protected from light, and all other components at –30°C to –10°C. Do not freeze-thaw the kit components more than three times.

Lactate-Glo™ Assay

Product	Size	Cat.#
Lactate-Glo™ Assay	5 ml	J5021
	50 ml	J5022

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Lactate-Glo™ Assay is a bioluminescent assay for rapid, selective and sensitive detection of L-lactate in biological samples. Lactate is produced by glycolysis, a major metabolic pathway responsible for glucose homeostasis and energy production. Once considered merely a byproduct of glycolysis, lactate is now considered an important regulatory molecule of intermediate metabolism involved in cancer development, diabetes and other diseases.

Features:

- Perform in high-throughput workflows.
- Multiplex with other metabolite or viability assays.
- Linear range up to 200µM.

Storage Conditions: Store complete kits at less than –65°C. Alternatively, store the Reductase Substrate at less than –65°C protected from light, and all other components at –30°C to –10°C. Do not freeze-thaw the kit components more than three times.

Glutamate-Glo™ Assay

Product	Size	Cat.#
Glutamate-Glo™ Assay	5 ml	J7021
	50 ml	J7022

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Glutamate is an important metabolite, serving as a precursor for the synthesis of nucleic acids, nucleotides and proteins. Glutamate is also a key neurotransmitter in nerve cells. Upregulated glutamate production is used as a marker of increased cancer cell dependence on glutaminolysis to support high proliferation rates. The Glutamate-Glo™ Assay is a suitable assay for measuring changes in glutamate levels in a variety of samples, and the assay is sensitive enough to detect even intracellular amounts of glutamate.

Features:

- Amenable to high-throughput formats.
- Detect even intracellular levels of glutamate.
- Limit of detection in the nM range.

Storage Conditions: Store complete kits at less than –65°C. Alternatively, store the Reductase Substrate at less than –65°C protected from light, and all other components at –30°C to –10°C. Do not freeze-thaw the kit components more than three times.

Glutamine/Glutamate-Glo™ Assay

Product	Size	Cat.#
Glutamine/Glutamate-Glo™ Assay	5 ml	J8021
	50 ml	J8022

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Glutamine/Glutamate-Glo™ Assay is a bioluminescent assay for the rapid and sensitive measurement of glutamine and glutamate from a variety of sample types. The bioluminescent signal eliminates signal interference that colorimetric and fluorescent assays suffer. Both glutamine and glutamate are measured from the sample; no separate assay is needed.

Features:

- Detect even small changes in metabolites.
- Multiplex with other metabolite or viability assays.
- Perform on a variety of sample types.

Storage Conditions: Store complete kits at less than –65°C. Alternatively, store the Reductase Substrate at less than –65°C protected from light, and all other components at –30°C to –10°C. Do not freeze-thaw the kit components more than three times.

Glucose Uptake-Glo™ Assay

Product	Size	Cat.#
Glucose Uptake-Glo™ Assay	5 ml	J1341
	10 ml	J1342
	50 ml	J1343

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Glucose Uptake-Glo™ Assay is a non-radioactive, plate-based, homogeneous bioluminescent method for measuring glucose uptake in mammalian cells based on the detection of 2-deoxyglucose-6-phosphate (2DG6P). When 2-deoxyglucose (2DG) is added to cells, it is transported across the membrane and rapidly phosphorylated in the same manner as glucose. However, enzymes that further modify glucose-6-phosphate (G6P) cannot modify 2DG6P, and thus this membrane-impermeable analyte accumulates in the cell. After a brief period of incubation, an acid detergent solution (Stop Buffer) is added to lyse cells, terminate uptake and destroy any NADPH within the cells. A high-pH buffer solution (Neutralization Buffer) is then added to neutralize the acid. A Detection Reagent containing glucose-6-phosphate dehydrogenase (G6PDH), NADP+, Reductase, Ultra-Glo™ Recombinant Luciferase and proluciferin substrate is added to the sample wells. G6PDH oxidizes 2DG6P to 6-phosphodeoxygluconate and simultaneously reduces NADP+ to NADPH. The Reductase uses NADPH to convert the proluciferin to luciferin, which is then used by Ultra-Glo™ Recombinant Luciferase to produce a luminescent signal that is proportional to the concentration of 2DG6P.

Features:

- **Use a Non-Radioactive Assay:** The assay is based on the same principal as the radioactive approach, but no radioactivity is required.
- **Follow a Simple and Homogeneous Protocol:** After addition of 2DG, there are no wash steps—all steps are additions.
- **Achieve Sensitivity with Broad Linearity:** The Glucose Uptake-Glo™ Assay can detect 0.5 to 30µM 2DG6P and generates a signal-to-background ratio >3 with as few as 5,000 cells.
- **Automate your Workflow:** The add-and-read format is compatible with automated and high-throughput workflow; reactions are scalable for use in 96- and 384-well plates.
- **Get Reliable and Reproducible Results:** The Glucose Uptake-Glo™ Assay yields Z′ factors >0.5.

Storage Conditions: Store at –30°C to –10°C.

Oxidative Stress Assays

ROS-Glo™ H_2O_2 Assay

Product	Size	Cat.#
ROS-Glo™ H_2O_2 Assay	10 ml	G8820
	50 ml	G8821

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ROS-Glo™ H_2O_2 Assay is a homogeneous, fast and sensitive bioluminescent assay that measures the level of hydrogen peroxide (H_2O_2), a reactive oxygen species (ROS), directly in cell culture or in defined enzyme reactions. A derivatized luciferin substrate is incubated with sample and reacts directly with H_2O_2 to generate a luciferin precursor. Addition of ROS-Glo™ Detection Solution converts the precursor to luciferin and provides Ultra-Glo™ Recombinant Luciferase to produce light signal that is proportional to the level of H_2O_2 present in the sample.

Features:

- **Direct Cell-Based Detection:** The assay can be performed in various cell culture media with or without serum, eliminating the need to remove the media from cultured cells before performing the assay.
- **Simple and Fast Assay:** The homogeneous assay is performed following a simple two-reagent-addition protocol that does not require sample manipulation. The assay can be completed in less than 2 hours after reagent addition.
- **Non-HRP-Based Detection:** The ROS-Glo™ H_2O_2 Substrate reacts directly with H_2O_2, obviating the need for horseradish peroxidase (HRP) as a coupling enzyme and thus eliminating false hits associated with HRP inhibition.
- **Automation-Compatible Format:** Easily scale from 96- to 384-well plate formats.
- **Flexible Assay:** The assay can be used to screen compounds in both cell-based and enzyme-based formats.
- **Multiplex-Compatible System:** Get more informative data per well and reduce cell culture expenses by multiplexing with a real-time cytotoxicity assay (CellTox™ Green Cytotoxicity Assay) in the same well or with a viability assay.

Storage Conditions: Store all components at –30°C to –10°C.

Available in the Helix® on-site stocking system

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GSH/GSSG-Glo™ Assay

Product	Size	Cat.#
GSH/GSSG-Glo™ Assay	10 ml	V6611
	50 ml	V6612

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The GSH/GSSG-Glo™ Assay is a luminescence-based system for the detection and quantification of total glutathione (GSH +GSSG), GSSG and GSH/GSSG ratios in cultured cells. A change in GSH levels is important in the assessment of toxicological responses and is an indicator of oxidative stress, potentially leading to apoptosis or cell death. The assay provides a simple, rapid multiwell-plate format where stable luminescent signals are correlated with either the total GSH or the GSSG concentration of a sample directly in culture wells. Both total glutathione and GSSG determinations are based on the reaction where GSH-dependent conversion of a GSH probe, Luciferin-NT, to luciferin by a glutathione-S-transferase enzyme is coupled to a firefly luciferase reaction. Light from luciferase is dependent on the amount of luciferin formed, which is in turn dependent on the amount of GSH present. This makes the luminescent signal proportional to the amount of GSH. Determination of total glutathione and GSSG are performed in parallel reactions. In one configuration the assay reagents measure total glutathione using a reducing agent that converts all the glutathione, GSH and GSSG in a cell lysate to the reduced form, GSH. In a second configuration the assay reagents are used to measure only the oxidized form, GSSG. In this case, a reagent is added that blocks all the GSH while leaving the GSSG intact. This blocking step is followed by a reducing step that converts the GSSG to GSH for quantification in the luminescent reaction. Because the assays are performed directly on cells in culture wells, loss of GSH or GSSG is minimized, reducing variability.

Features:

- **Physiologically Relevant GSH/GSSG Ratios:** Actual levels of total glutathione and GSSG are measured directly in cell-culture wells, minimizing the loss of GSH and GSSG, compared to conventional assays that require upfront sample preparation and indirect GSSG calculation.
- **More Robust Performance:** Bioluminescent technology and a simple protocol minimize sample handling, reducing variability.
- **Simplified Protocol:** Assay reagents are added directly to cells cultured in multiwell plates. The homogeneous add-mix-read format eliminates time-consuming sample deproteination and centrifugation steps required of conventional assays.
- **Greater Sensitivity:** Fewer cells are required in these assays than in conventional assays because of the enhanced sensitivity.
- **Faster Results:** The homogeneous add-mix-read protocol minimizes hands-on time, and the bioluminescence technology minimizes incubation time.
- **Adaptable to Automation:** The glow-type signal is stable, with a half-life greater than two hours, and the protocol is adaptable to automation in 96- and 384-well plates.
- **No Fluorescence Interference:** Using luminescence readout eliminates the fluorescent interference between reagents and test compounds sometimes seen in fluorescence assays. Such overlap can confound analysis and present misleading or irrelevant data.

Storage Conditions: Store at –20°C protected from light.

GSH-Glo™ Glutathione Assay

Product	Size	Cat.#
GSH-Glo™ Glutathione Assay	10 ml	V6911
	50 ml	V6912

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The GSH-Glo™ Assay is a luminescent-based assay for the detection and quantification of glutathione (GSH) in cells or in various biological samples. A change in GSH levels is important in assessment of toxicological responses and is an indicator of oxidative stress, potentially leading to apoptosis or cell death. The assay is based on the conversion of a luciferin derivative into luciferin in the presence of GSH. The reaction is catalyzed by a glutathione S-transferase (GST) enzyme supplied in the kit. The luciferin formed is detected in a coupled reaction using Ultra-Glo™ Recombinant Luciferase that generates a glow type luminescence that is proportional to the amount of glutathione present in cells. The assay provides a simple, fast and sensitive alternative to colorimetric and fluorescent methods and can be adapted easily to high-throughput applications.

Features:

- **Fast:** Results in as little as 30 minutes.
- **Simplified Method:** The simple two-reagent-addition assay minimizes the number of assay steps compared to conventional GSH assays and is adapted easily to higher throughput applications. No deproteination step required!
- **Greater Sensitivity:** The luminescent method avoids inherent background fluorescence associated with other methods thereby providing excellent signal-to-background ratios.
- **Stable Signal:** Half-life greater than 5 hours.

Storage Conditions: Store at –20°C protected from light.

Signaling Pathway Analysis (Minimal Promoter-Driven) Firefly Luciferase Vectors

Product	Size	Cat.#
pGL4.37[*luc2P*/ARE/Hygro] Vector	20 µg	E3641
pGL4.38[*luc2P*/p53 RE/Hygro] Vector	20 µg	E3651
pGL4.39[*luc2P*/ATF6 RE/Hygro] Vector	20 µg	E3661
pGL4.40[*luc2P*/MRE/Hygro] Vector	20 µg	E4131
pGL4.41[*luc2P*/HSE/Hygro] Vector	20 µg	E3751
pGL4.42[*luc2P*/HRE/Hygro] Vector	20 µg	E4001
pGL4.43[*luc2P*/XRE/Hygro] Vector	20 µg	E4121
pGL4.44[*luc2P*/AP1 RE/Hygro] Vector	20 µg	E4111
pGL4.45[*luc2P*/ISRE/Hygro] Vector	20 µg	E4141
pGL4.47[*luc2P*/SIE/Hygro] Vector	20 µg	E4041
pGL4.48[*luc2P*/SBE/Hygro] Vector	20 µg	E3671
pGL4.49[*luc2P*/TCF-LEF RE/Hygro] Vector	20 µg	E4611
pGL4.52[*luc2P*/STAT5RE/Hygro] Vector	20 µg	E4651
pGL4.29[*luc2P*/CRE/Hygro] Vector	20 µg	E8471
pGL4.30[*luc2P*/NFAT-RE/Hygro] Vector	20 µg	E8481
pGL4.32[*luc2P*/NF-κB-RE/Hygro] Vector	20 µg	E8491
pGL4.33[*luc2P*/SRE/Hygro] Vector	20 µg	E1340
pGL4.34[*luc2P*/SRF-RE/Hygro] Vector	20 µg	E1350
Available Separately		
pGL4.23[*luc2*/minP] Vector	20 µg	E8411
pGL4.24[*luc2P*/minP] Vector	20 µg	E8421
GloResponse™ NFAT-RE-*luc2P* HEK293 Cell Line	2 vials	E8510
GloResponse™ NF-κB-RE-*luc2P* HEK293 Cell Line	2 vials	E8520
pGL4.25[*luc2CP*/minP] Vector	20 µg	E8431
pGL4.26[*luc2*/minP/Hygro] Vector	20 µg	E8441
pGL4.27[*luc2P*/minP/Hygro] Vector	20 µg	E8451
pGL4.28[*luc2CP*/minP/Hygro] Vector	20 µg	E8461
GloResponse™ CRE-*luc2P* HEK293 Cell Line	2 vials	E8500

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Creating a cell line with an indicator of a functional signaling pathway is useful for deciphering the components in a signaling pathway. These tools are made by insertion of multiple repeats of a response element upstream of a minimal promoter (minP). Promega has designed vectors that report the activity of a variety of pathways using the optimized *luc2* firefly luciferase gene in the pGL4 backbone. These vectors also have a hygromycin resistance selectable marker, allowing use either in transient transfection experiments or for selection of a stable cell line.

Also available for construction of pathway reporters are minimal promoter (minP) vectors with three varieties of engineered firefly luciferase genes: *luc2, luc2P* or *luc2CP*. The *luc2* gene is engineered to remove most cryptic transcription factor binding sites and improve mammalian expression through codon optimization. The *luc2P* and *luc2CP* and RapidResponse™ genes are *luc2* genes appended with degradation sequences to influence the cellular half-life of the luc2 gene. The RapidResponse™ genes respond more rapidly to stimuli but at the expense of signal intensity. The *luc2P* (1-hour half-life) gene responds more rapidly than *luc2* (3-hour half-life) with moderate signal intensity, and the *luc2CP* (0.4-hour half-life) responds more quickly with the lowest signal intensity. The minP vectors are available with or without selectable markers (hygromycin). To speed research, several pre-designed response element vectors are available already assembled in the pGL4.27 Vector. Some of these also are available stable cell lines (GloResponse™ Cell Lines).

Features:

- Pre-designed vectors remove the need to clone and validate an assay.
- **Increased Reporter Gene Expression:** Codon optimization of synthetic genes for mammalian expression.
- **Reduced Background and Risk of Expression Artifacts:** Removal of cryptic DNA regulatory elements and transcription factor binding sites.
- **Improved Temporal Response:** Rapid Response™ technology using destabilized luciferase genes.
- **Easy Transition from Transient to Stable Cells:** Choice of mammalian selectable markers.

Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system

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Mitochondrial Toxicity Assay

Product	Size	Cat.#
Mitochondrial ToxGlo™ Assay	10 ml	G8000
	100 ml	G8001

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Mitochondrial ToxGlo™ Assay is a cell-based assay method that employs a sequential addition, multiplexed assay chemistry for predicting potential mitochondrial dysfunction as a result of xenobiotic exposure. The assay is based on the differential measurement of biomarkers associated with changes in cell membrane integrity and cellular ATP levels relative to vehicle-treated control cells during short exposure periods. Cell membrane integrity is first assessed by measuring the presence or absence of a distinct protease activity associated with necrosis using a fluorogenic peptide substrate (bis-AAF-R110) to measure "dead cell protease activity". The bis-AAF-R110 Substrate cannot cross the intact membrane of live cells and therefore gives no signal with viable cells. Next, ATP is measured by adding an ATP detection reagent, resulting in cell lysis and generation of a luminescent signal proportional to the amount of ATP present. The two sets of data can be combined to produce profiles representative of mitochondrial dysfunction or non-mitochondrial related cytotoxic mechanisms.

Mammalian cells generate ATP by mitochondrial (oxidative phosphorylation) and non-mitochondrial (glycolysis) methods. To achieve optimal mitochondrial responsiveness, it may be necessary to refine cell culture conditions. Replacing glucose-supplemented medium with galactose-containing medium may increase cellular oxygen consumption and augment mitochondrial susceptibility to mitotoxicants.

Features:

- **Distinguish Primary Mitochondrial Dysfunction from Secondary Cytotoxic Events:** Cell-based, multiplexed method measures ATP (a proximal measure of mitochondrial function) in conjunction with a membrane integrity biomarker to distinguish primary mitochondrial dysfunction from secondary cytotoxic events directly in the same sample well.
- **Predictive for Mitochondrial Toxicities:** Produces profiles that are consistent with mitochondrial toxicity and discernible from other non-mitotoxic mechanisms of cell death.
- **Easy to Implement:** The assay uses a simple sequential "add-mix-read" format.
- **Fast:** Quickly assess potential mitochondrial liabilities in under an hour.
- **Cost-Effective:** Assays are performed directly in cell culture plates using standard multimode detection instrumentation.
- **Flexible and Easily Automated:** The volume of reagent addition can be scaled to meet throughput needs; the assay is amenable to automation in 96- and 384-well plates.

Storage Conditions: Store the Mitochondrial ToxGlo™ Assay components at –20°C.

Griess Reagent System

Product	Size	Cat.#
Griess Reagent System	1,000 assays	G2930

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Griess Reagent System measures nitrite (NO_2^-), which is one of two primary stable and nonvolatile breakdown products of nitric oxide (NO). Nitric oxide is an important physiological messenger and effector molecule in many biological systems, including immunological, neuronal and cardiovascular tissues. This assay relies on a diazotization reaction that was originally described by Griess in 1879. Through the years, many modifications to the original reaction have been described.

The Griess Reagent System is based on a chemical reaction that uses sulfanilamide and N-1-naphthylethylenediamine dihydrochloride (NED) under acidic (phosphoric acid) conditions. This system detects NO_2^- in a variety of biological and experimental liquid matrices such as plasma, serum, urine and tissue culture medium. The nitrite sensitivity is dependent on the matrix. The limit of detection is 2.5µM (125pmol) nitrite (in ultrapure, deionized, distilled water) using the protocol described in Technical Bulletin #TB229.

Storage Conditions: Store at 4°C. Keep all solutions in their original light-protective plastic bottles.

Nucleotide and Co-Factor Detection Assays

CellTiter-Glo® 2.0 Assay

Product	Size	Cat.#
CellTiter-Glo® 2.0 Assay	10 ml	G9241
	100 ml	G9242
	500 ml	G9243

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The CellTiter-Glo® 2.0 Assay provides a homogeneous method for determining the number of viable cells in culture by measuring the amount of ATP present, which indicates the presence of metabolically active cells. The CellTiter-Glo® 2.0 Assay is based on the original CellTiter-Glo® Assay chemistry but with improved storage convenience for easy implementation. The CellTiter-Glo® 2.0 Assay is provided as a single, ready-to-use reagent that can be stored at 4°C for up to 5 months with >90% activity remaining or at room temperature for 1 week with >85% activity remaining. The CellTiter-Glo® 2.0 Assay is designed for use with multiwell plate formats, making it ideal for automated high-throughput screening (HTS), cell proliferation and cytotoxicity assays. The homogeneous assay procedure involves adding the single reagent (CellTiter-Glo® 2.0 Reagent) directly to cells cultured in serum-supplemented medium. Cell washing, removal of medium and multiple pipetting steps are not required. The system detects as few as 15 cells/well in a 384-well format in 10 minutes after adding reagent.

The homogeneous "add-mix-measure" format results in cell lysis and generation of a luminescent signal proportional to the amount of ATP present. The amount of ATP is directly proportional to the number of cells present in culture. The CellTiter-Glo® 2.0 Assay generates a "glow-type" luminescent signal, which has a half-life generally greater than three hours, depending on cell type and medium used. The extended half-life eliminates the need to use reagent injectors and provides flexibility for continuous or batch-mode processing of multiple plates.

Features:

- **Ready-to-Use Reagent:** The single, ready-to-use reagent and convenient storage stability at 4°C or 22°C eliminate reagent thawing and preparation, freeing up resources and time, and allow fast and easy implementation.
- **Improved Storage Stability:** Storage stability at 4°C or room temperature allows the same kit to be used multiple times over several days or weeks while maintaining performance.
- **Robust:** Stable luminescent signal with a half-life >3 hours, depending on cell type and culture medium used, allowing batch processing; delivers excellent Z′-factor values for screening applications.
- **Flexible:** The assay can be used with various multiwell formats (96-well, regular or low-volume 384-well and 1,536-well plates. Reagents are offered in volumes to accommodate low-throughput to high-throughput applications. Data can be recorded by luminometer or CCD camera or other imaging device capable of reading luminescence in multiwell plates.
- **Able to Multiplex:** Can be used with other nonlytic-compatible cell-based assay chemistries from Promega.
- **Simple Protocol:** Uses a simple add-mix-read protocol with just a 10-minute incubation.

Storage Conditions: The CellTiter-Glo® 2.0 Assay is shipped frozen and can be stored at –30°C to –10°C through the expiration date of the reagent. The CellTiter-Glo® 2.0 Reagent can maintain >90% activity upon storage at 4°C for 5 months or >85% activity upon storage at 22–25°C for 7 days. The CellTiter-Glo® 2.0 Reagent can withstand four additional freeze-thaw cycles after the first thaw with no loss of activity when the reagent is stored at –30°C to –10°C.

NAD/NADH-Glo™ Assay

Product	Size	Cat.#
NAD/NADH-Glo™ Assay	10 ml	G9071
	50 ml	G9072

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The NAD/NADH-Glo™ Assay is a bioluminescent, homogeneous single-reagent-addition assay for detecting total oxidized and reduced nicotinamide adenine dinucleotides (NAD^+ and NADH, respectively) and determining their ratio in biological samples or in defined enzyme reactions. An NAD Cycling Enzyme is used to convert NAD^+ to NADH. In the presence of NADH, the provided reductase enzyme reduces a proluciferin reductase substrate to form luciferin. Luciferin then is quantified using Ultra-Glo™ Recombinant Luciferase, and the light signal produced is proportional to the amount of NAD^+ and NADH in the sample. Cycling between NAD^+ and NADH by the NAD Cycling Enzyme and Reductase increases assay sensitivity and provides selectivity for the nonphosphorylated NAD^+ and NADH compared to the phosphorylated forms $NADP^+$ and NADPH.

The NAD Cycling Enzyme, Reductase and luciferase reactions are initiated by adding an equal volume of NAD/NADH-Glo™ Detection Reagent, which contains NAD Cycling Enzyme and Substrate, Reductase, Reductase Substrate and Ultra-Glo™ Recombinant Luciferase, to an NAD^+- or NADH-containing sample. Detergent present in the reagent lyses cells, allowing detection of total cellular NAD^+ and NADH in a multiwell format with addition of a single reagent. An accessory protocol is provided to allow separate measurements of NAD^+ and NADH, and calculation of the NAD^+ to NADH ratio. The simple add-mix-read protocol and scalable assay chemistry make the NAD/NADH-Glo™ Assay well suited to monitor effects of small molecule compounds on NAD and NADH levels in high-throughput formats.

Features:

- **High Sensitivity:** High sensitivity of the assay enables detection of total NAD^+ and NADH directly in the wells. Fewer cells are required, with no sample preparation.
- **Homogeneous, One-Step Protocol:** Total NAD^+ and NADH is measured directly in wells of a 96- or 384-well cell culture plate with one reagent addition. A simple in-plate protocol is provided for individual NAD^+ and NADH measurements.
- **Large Assay Window:** The NAD/NADH-Glo™ Assay detects 10nM to 400nM NAD^+ or NADH. The assay detects 100nM with a signal higher than fivefold over background and an assay window (maximum signal-to-background ratio) of ≥100.
- **Automation Compatible:** The assay is compatible with automated and high-throughput protocols. Reactions are scalable and can be performed at low volumes in 96-, 384- and 1536-well plates.
- **Reliability and Reproducibility:** The NAD/NADH-Glo™ Assay routinely yields Z′ factors >0.7.
- **Luminescence-Based NAD^+ and NADH Detection:** The luminescent format avoids fluorescent interference due to reagents and test compounds sometimes seen in fluorescent assays.

Storage Conditions: Store all components at –20°C (–30°C to –10°C).

Available in the Helix® on-site stocking system

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NADP/NADPH-Glo™ Assay

Product	Size	Cat.#
NADP/NADPH-Glo™ Assay	10 ml	G9081
	50 ml	G9082

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The NADP/NADPH-Glo™ Assay is a bioluminescent, homogeneous, single-reagent-addition method for rapid detection of total oxidized and reduced nicotinamide adenine dinucleotide phosphates ($NADP^+$ and NADPH, respectively) and determining their ratio in biological samples and defined enzyme reactions. An NADP cycling enzyme is used to convert $NADP^+$ to NADPH. In the presence of NADPH, a reductase enzyme reduces a proluciferin reductase substrate to form luciferin. Luciferin then is quantified using Ultra-Glo™ Recombinant Luciferase, and the light signal produced is proportional to the amount of $NADP^+$ and NADPH in the sample. Cycling between $NADP^+$ and NADPH by the NADP cycling enzyme and reductase increases assay sensitivity and provides selectivity for the phosphorylated $NADP^+$ and NADPH compared to the nonphosphorylated forms NAD^+ and NADH.

The NADP Cycling Enzyme, Reductase and luciferase reactions are initiated by adding an equal volume of NADP/NADPH-Glo™ Detection Reagent, which contains NADP cycling enzyme and substrate, reductase, proluciferin reductase substrate and Ultra-Glo™ Recombinant Luciferase, to an $NADP^+$- or NADPH-containing sample. Detergent present in the reagent lyses cells, allowing detection of total cellular $NADP^+$ and NADPH in a multiwell format with addition of a single reagent. The one-step protocol is useful for screening changes in total $NADP^+$ and NADPH levels. An accessory protocol is provided to allow separate measurements of $NADP^+$ and NADPH and calculation of the $NADP^+$ to NADPH ratio. The simple add-mix-read protocol and scalable assay chemistry make the NADP/NADPH-Glo™ Assay well suited to monitor effects of small-molecule compounds on NADP and NADPH levels in high-throughput formats.

Features:

- **High Sensitivity:** High sensitivity of the assay enables detection of total $NADP^+$ and NADPH directly in the wells. Fewer cells are required, with no sample preparation.
- **Homogeneous, One-Step Protocol:** Total $NADP^+$ and NADPH is measured directly in wells of a 96- or 384-well cell culture plate with one reagent addition. A simple in-plate protocol is provided for individual $NADP^+$ and NADPH measurements.
- **Large Assay Window:** The NADP/NADPH-Glo™ Assay detects 10nM to 400nM $NADP^+$ or NADPH. The assay detects 100nM with a signal higher than fivefold over background and an assay window (maximum signal-to-background ratio) of ≥100.
- **Automation Compatible:** The assay is compatible with automated and high-throughput protocols. Reactions are scalable and can be performed at low volumes in 96-, 384- and 1536-well plates.
- **Reliability and Reproducibility:** The NADP/NADPH-Glo™ Assay routinely yields Z′ factors >0.7.
- **Luminescence-Based $NADP^+$ and NADPH Detection:** The luminescent format avoids fluorescent interference due to reagents and test compounds sometimes seen in fluorescent assays.

Storage Conditions: Store all components at –20°C (–30°C to –10°C).

NAD(P)H-Glo™ Detection System

Product	Size	Cat.#
NAD(P)H-Glo™ Detection System	10 ml	G9061
	50 ml	G9062

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The in vitro enzyme-based NAD(P)H-Glo™ Detection System is a homogeneous, bioluminescent assay that quantitatively monitors the concentration of the reduced forms of nicotinamide adenine dinucleotides, NADH and NADPH, and does not discriminate between them. The oxidized forms, NAD+ and NADP+, are not detected and do not interfere with quantitation.

In the presence of NAD(P)H, a reductase enzyme reduces a proluciferin reductase substrate to form luciferin. Luciferin then is quantified using Ultra-Glo™ Recombinant Luciferase, and the light signal produced is proportional to the amount of NAD(P)H in the sample. The reductase and luciferase reactions are initiated by adding an equal volume of a single reagent, which contains reductase, proluciferin Reductase Substrate and Ultra-Glo™ Recombinant Luciferase, to a NAD(P)H-containing sample.

The assay is rapid, requiring only a 40- to 60-minute incubation, has a broad linear range and high signal-to background ratio. The assay is well suited to measuring NAD(P)H production or consumption in high-throughput formats.

Features:

- **Broad Linear Range:** The NAD(P)H-Glo™ Detection System detects 0.1µM to 25µM NAD(P)H.
- **High Sensitivity:** The limit of detection is ≤0.1µM NADH, with a maximum assay window (i.e., signal-to-background ratio) of 250. The system detects 1µM with a signal higher than fivefold over background.
- **Automation Compatible:** The add-and-read format is compatible with automated and high-throughput protocols. Reactions are scalable and can be performed at low volumes in 96-, 384- and 1536-well plates.
- **Reliability and Reproducibility:** The NAD(P)H-Glo™ Detection System routinely yields Z′ factors >0.7.
- **Stable Signal:** The glow-type signal is stable, with a half-life greater than two hours, allowing batch plate processing.
- **Luminescence-Based NAD(P)H Detection:** The luminescent format avoids fluorescent interference due to reagents and test compounds sometimes seen in fluorescent assays.

Storage Conditions: Store all components at –20°C (–30°C to –10°C).

Promega

Imaging and Immunological Detection

Products tagged with the Helix® icon are available for distribution through our convenient on-site stocking program in a freezer, refrigerated unit or an ambient cabinet.

For more information visit: **www.promega.com/helix**

Available in the Helix® on-site stocking system

Cell and Whole Animal Imaging

HaloTag® Fluorescent Ligands

Product	Size	Conc.	Cat.#
HaloTag® TMR Ligand	30 µl	5 mM	G8251
	15 µl	5 mM	G8252
HaloTag® Oregon Green® Ligand	30 µl	1 mM	G2801
	15 µl	1 mM	G2802
HaloTag® diAcFAM Ligand	30 µl	1 mM	G8272
	15 µl	1 mM	G8273
HaloTag® Coumarin Ligand	30 µl	10 mM	G8581
	15 µl	10 mM	G8582
HaloTag® Alexa Fluor® 488 Ligand	30 µl	1 mM	G1001
	15 µl	1 mM	G1002
HaloTag® Alexa Fluor® 660 Ligand	30 µl	3.5 mM	G8471
	15 µl	3.5 mM	G8472
HaloTag® TMRDirect™ Ligand	30 µl	0.1 mM	G2991
HaloTag® R110Direct™ Ligand	30 µl	0.1 mM	G3221
HaloTag® Biotin Ligand	30 µl	5 mM	G8281
	15 µl	5 mM	G8282
HaloTag® PEG-Biotin Ligand	30 µl	5 mM	G8591
	15 µl	5 mM	G8592

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Description: The HaloTag® Fluorescent Ligands can carry a variety of functionalities, including fluorescent labels, affinity tags and attachments to a solid phase. The covalent bond forms rapidly under general physiological conditions, is highly specific and essentially irreversible. The HaloTag® Fluorescent Ligands allow researchers to apply the chloroalkane group that HaloTag® protein reacts with to any compound or surface with a compatible chemical group, creating endless possible applications.

HaloTag® Fluorescent Ligands for Cellular Imaging

Cell-permeant fluorescent ligands (rapid labeling protocol):

- HaloTag® TMR Ligand ($555_{Ex}/585_{Em}$)
- HaloTag® Oregon Green® Ligand ($496_{Ex}/516_{Em}$)
- HaloTag® diAcFAM Ligand ($494_{Ex}/526_{Em}$)
- HaloTag® Coumarin Ligand ($353_{Ex}/434_{Em}$)

Cell-impermeant fluorescent ligands for cell-surface labeling (rapid labeling protocol):

- HaloTag® Alexa Fluor® 488 Ligand ($494_{Ex}/517_{Em}$)
- HaloTag® Alexa Fluor® 660 Ligand ($663_{Ex}/690_{Em}$)

Cell-permeant fluorescent ligands (“no wash” protocol):

- HaloTag® TMRDirect™ Ligand ($555_{Ex}/585_{Em}$)
- HaloTag® R110Direct™ Ligand ($502_{Ex}/527_{Em}$)

The Alexa Fluor® 488 Ligand is impermeable to cell membranes and, therefore, used to label cell surface proteins. The TMR Ligand, Oregon Green® Ligand, diAcFAM Ligand and Coumarin Ligand readily cross the cell membrane and, therefore, can be used to label intracellular proteins.

HaloTag® Ligands for Protein Detection

The HaloTag® Biotin Ligand consists of a 12-atom linker arm to biotin and is used as an affinity tag to capture the HaloTag® protein-based fusion construct using the strong biotin-streptavidin interaction.

The HaloTag® PEG-Biotin Ligand contains a spacer not found in the HaloTag® Biotin Ligand. This provides a significantly longer and more flexible linker between streptavidin and the HaloTag® protein, which may be advantageous in preserving the activity of a HaloTag® fusion partner protein upon immobilization or derivatization.

Features:

- **Label in Solution or on a Solid Support:** The HaloTag® Ligands bind to the HaloTag® protein or protein fusions with high specificity and affinity.
- **Label Your HaloTag® Protein in Live Cells:** The HaloTag® TMR, diAcFAM, Coumarin and Biotin Ligands readily cross the cell membrane.
- **Pull Down Protein Complexes:** The spacer and reactive linker of the HaloTag® PEG-Biotin Ligand provide ideal pull-down capabilities. Alternatively, pull down directly with the HaloLink™ Resin.
- **Image Fixed Cells:** The covalent bond is stable, allowing imaging of fixed cells and analysis of the labeled protein under stringent conditions.
- **Introduce Novel Functionalities or Perform Sequential Labeling:** The open architecture of the technology enables the use of different ligands for multiple applications.
- **Design Only One Genetic Construct for Multiple Experiments:** Obtain new functionality by using a different HaloTag® Ligand without having to design and clone a new expression construct.
- **Analyze Labeled Fusion Proteins Using SDS-PAGE, Mass Spectrometry, etc.:** The bound ligand is stable under denaturing conditions.

HaloTag® Fusion (C-Terminal) Mammalian Expression Vectors

Product	Size	Cat.#
pHTC HaloTag® CMV-neo Vector	20 µg	G7711
pFC27A HaloTag® CMV-neo Flexi® Vector	20 µg	G8421
pFC27K HaloTag® CMV-neo Flexi® Vector	20 µg	G8431
pFC14A HaloTag® CMV Flexi® Vector	20 µg	G9651
pFC14K HaloTag® CMV Flexi® Vector	20 µg	G9661
pFC15A HaloTag® CMV*d1* Flexi® Vector	20 µg	G1611
pFC15K HaloTag® CMV*d1* Flexi® Vector	20 µg	G1601
pFC16A HaloTag® CMV*d2* Flexi® Vector	20 µg	G1591
pFC16K HaloTag® CMV*d2* Flexi® Vector	20 µg	G1571
pFC17A HaloTag® CMV*d3* Flexi® Vector	20 µg	G1551
pFC17K HaloTag® CMV*d3* Flexi® Vector	20 µg	G1321
Available Separately		
HaloTag® Cloning Starter System	1 each	G6050
HaloTag® Flexi® Vectors—CMV Deletion Series Sample Pack	9 × 2 µg	G3780
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: These vectors are designed for expression of C-terminal-tagged HaloTag® fusion proteins in mammalian cells. Once expressed, the HaloTag® fusion protein may be used for cell imaging of protein localization or trafficking in conjunction with the fluorescent HaloTag® Ligands. In addition, the HaloTag® fusion protein can be purified or pulled down as a complex with its protein partners.

We offer two types of HaloTag® fusion vectors to accommodate your cloning preferences:

- **pHT Vector Series:** Simple Multiple Cloning Site (MCS) plasmids for traditional cloning.
- **pF Vector Series**: Flexi® Vector Cloning System—a directional cloning method for protein-coding sequences. It is based on two rare-cutting restriction enzymes, SgfI and PmeI, and provides a rapid, efficient and high-fidelity way to transfer protein-coding regions between a variety of Flexi® Vectors without the need to resequence.

Note: Flexi® Vectors contain the lethal barnase gene to reduce background colonies without inserts during the subcloning procedure. Using the Flexi® Vector Cloning System replaces the barnase gene with your insert. These vectors, as purchased, cannot be cultured in normal laboratory strains of *E. coli* without an insert.

Features:

- **Versatility:** You can choose between a variety of initial applications (e.g., bacterial protein, mammalian, or cell-free protein expression) and then transfer to others as required.
- **Time Savings:** Efficient transfer allows direct use of recombinant clones, minimizing time wasted screening background colonies.
- **Enhanced Productivity:** Adaptable to high-throughput formats for large screening projects.
- **Easy Access:** No licensing fees or complicated transfer restrictions.

Storage Conditions: Store vectors at –20°C.

HaloTag® Fusion (N-Terminal) Mammalian Expression Vectors

Product	Size	Cat.#
pHTN HaloTag® CMV-neo Vector	20 µg	G7721
pFN28A HaloTag® CMV-neo Flexi® Vector	20 µg	G8441
pFN28K HaloTag® CMV-neo Flexi® Vector	20 µg	G8451
pFN21A HaloTag® CMV Flexi® Vector	20 µg	G2821
pFN21K HaloTag® CMV Flexi® Vector	20 µg	G2831
pFN22A HaloTag® CMV*d1* Flexi® Vector	20 µg	G2841
pFN22K HaloTag® CMV*d1* Flexi® Vector	20 µg	G2851
pFN23A HaloTag® CMV*d2* Flexi® Vector	20 µg	G2861
pFN23K HaloTag® CMV*d2* Flexi® Vector	20 µg	G2871
pFN24A HaloTag® CMV*d3* Flexi® Vector	20 µg	G2881
pFN24K HaloTag® CMV*d3* Flexi® Vector	20 µg	G2981
Available Separately		
HaloTag® Cloning Starter System	1 each	G6050
HaloTag® Flexi® Vectors—CMV Deletion Series Sample Pack	9 × 2 µg	G3780
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: These vectors are designed for expression of N-terminal-tagged HaloTag® fusion proteins in mammalian cells. Once expressed, the HaloTag® fusion protein may be used for cell imaging of protein localization or trafficking in conjunction with the fluorescent HaloTag® Ligands. In addition, the HaloTag® fusion protein can be purified or pulled down as a complex with its protein partners.

We offer two types of HaloTag® fusion vectors to accommodate your cloning preferences:

- **pHT Vector Series:** Simple Multiple Cloning Site (MCS) plasmids for traditional cloning.
- **pF Vector Series**: Flexi® Vector Cloning System—a directional cloning method for protein-coding sequences. It is based on two rare-cutting restriction enzymes, SgfI and PmeI, and provides a rapid, efficient and high-fidelity way to transfer protein-coding regions between a variety of Flexi® Vectors without the need to resequence.

Note: Flexi® Vectors contain the lethal barnase gene to reduce background colonies without inserts during the subcloning procedure. Using the Flexi® Vector Cloning System replaces the barnase gene with your insert. These vectors, as purchased, cannot be cultured in normal laboratory strains of *E. coli* without an insert.

Features:

- **Versatility:** You can choose between a variety of initial applications (e.g., bacterial protein, mammalian, or cell-free protein expression) and then transfer to others as required.
- **Time Savings:** Efficient transfer allows direct use of recombinant clones, minimizing time wasted screening background colonies.
- **Enhanced Productivity:** Adaptable to high-throughput formats for large screening projects.
- **Easy Access:** No licensing fees or complicated transfer restrictions.

Storage Conditions: Store vectors at –20°C.

Available in the Helix® on-site stocking system

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VivoGlo™ Caspase 3/7 Substrate (Z-DEVD-Aminoluciferin Sodium Salt)

Product	Size	Cat.#
VivoGlo™ Caspase-3/7 Substrate (Z-DEVD-Aminoluciferin, Sodium Salt)	50 mg	P1781
	5 × 50 mg	P1782

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: VivoGlo™ Caspase-3/7 Substrate (Z-DEVD-Aminoluciferin, Sodium Salt) is a firefly luciferase prosubstrate containing the DEVD tetrapeptide sequence recognized by caspase-3 and -7. Upon activation of caspase-3 or -7, the DEVD peptide is cleaved, and the liberated aminoluciferin reacts with luciferase to generate measurable light. Cleavage has been shown in in cellulo and in vivo systems. For mice, activity of a related salt was demonstrated when 10mg of the substrate in 150µl of saline was injected intraperitoneally. Other references suggest that doses as low as 1.5mg per mouse (50mg/kg) can be used. We recommend conducting a preliminary dose-response study using no more than 500mg/kg.

VivoGlo™ Caspase-3/7 Substrate (Z-DEVD-Aminoluciferin, Sodium Salt) has a minimum solubility of 500mg/ml in PBS, and the resulting solution is stable for at least 3 days at room temperature. Injection is usually done via the intraperitoneal route, and imaging is generally started 10 minutes after injection.

Features:

- **Highest Quality Substrates:** Eliminate potential interference in assays due to the presence of endotoxins.
- **Assured Product Integrity:** Most products are packaged in amber vials with septa to ensure product integrity as well as offer ease of dilution and use for imaging experiments. Product is packaged with fine tolerances to minimize the need to weigh substrates.
- **Flexibility and Convenience:** Available in multiple sizes to accommodate a variety of experimental settings.

Storage Conditions: Store at –20°C.

HaloTag® Ligand Building Blocks

Product	Size	Cat.#
HaloTag® Amine (04) Ligand	5 mg	P6741
HaloTag® Amine (02) Ligand	5 mg	P6711
HaloTag® Iodoacetamide (04) Ligand	5 mg	P6771
HaloTag® Succinimidyl Ester (04) Ligand	5 mg	P6751
HaloTag® Succinimidyl Ester (02) Ligand	5 mg	P1691

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The HaloTag® Ligand Building Blocks can carry a variety of functionalities, including fluorescent labels, affinity tags and attachments to a solid phase. The covalent bond forms rapidly under general physiological conditions, is highly specific and essentially irreversible. The HaloTag® Ligand Building Blocks allow researchers to apply the chloroalkane group that HaloTag® protein reacts with to any compound or surface with a compatible chemical group, creating endless possible applications.

The HaloTag® Succinimidyl Ester (04) Ligand contains a reactive succinimidyl ester (SE) group connected to an alkyl chloride separated by three ethylene glycol repeats (04). The HaloTag® Succinimidyl Ester (04) Ligand can be successfully conjugated to any reporter group, protein, or nucleic acid derivative containing an amine, forming stable amide bond linkages. The ligand with functional group can then be used with the HaloTag® protein for any application of interest.

The HaloTag® Succinimidyl Ester (O2) Ligand contains a reactive succinimidyl ester (SE) group connected to an alkylchloride separated by an ethylene glycol repeat (O2). The HaloTag® Succinimidyl Ester (O2) Ligand can be successfully conjugated to any reporter group, protein, or nucleic acid derivative containing an amine, forming stable amide bond linkages. The ligand with functional group can then be used with the HaloTag® protein for any application of interest.

The HaloTag® Amine (04) Ligand contains a reactive amine group connected to an alkyl chloride, separated by an ethylene glycol repeat (04). The HaloTag® Amine (04) Ligand can be successfully conjugated to any reporter group, protein, or nucleic acid derivative containing an activated carboxylic acid, sulfonyl halide or isocyanate. Examples of activated carboxylic acids are succinimidyl esters, STP esters, acid halides, and TFP esters. The ligand with functional group can then be used with the HaloTag® protein for any application of interest.

The HaloTag® Amine (O2) Ligand contains a reactive amine group connected to an alkylchloride, separated by an ethylene glycol repeat (O2). The HaloTag® Amine (O2) Ligand can be successfully conjugated to any reporter group, protein, or nucleic acid derivative containing an activated carboxylic acid, sulfonyl halide or isocyanate. Examples of activated carboxylic acids are succinimidyl esters, STP esters, acid halides and TFP esters. The ligand with functional group can then be used with the HaloTag® protein for any application of interest.

The HaloTag® Iodoacetamide (04) Ligand contains a reactive iodoacetamide group connected an alkyl chloride separated by an ethylene glycol repeat (04). The HaloTag® Iodoacetamide (04) Ligand has been designed to rapidly react with sulfhydryl-containing molecules, whether small organic compounds, peptides or proteins. The ligand with functional group can then be used with the HaloTag® protein for any application of interest.

Storage Conditions: Store Cat.# P1691 and P6751 at or below –70°C under inert atmosphere. Store Cat.# P6711 and P6741 at or below –20°C in an air-tight container in the absence of light. Store Cat.# P6771 at or below –20°C under inert atmosphere in the absence of light.

ViviRen™ In Vivo *Renilla* Luciferase Substrate

Product	Size	Cat.#
ViviRen™ In Vivo *Renilla* Luciferase Substrate	0.37 mg	P1231
	3.7 mg	P1232

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: ViviRen™ in vivo *Renilla* Luciferase Substrate is a uniquely engineered coelenterazine-based compound with protected oxidation sites. These modifications are designed to minimize substrate degradation and autoluminescence. It is reported that the ViviRen™ Substrate demonstrates brighter output when compared to the native coelenterazine substrate when used in an in vivo imaging application in a mouse model.

Cat.# P1231 is supplied as a liquid, 60mM in DMSO. Cat.# P1232 is supplied as a lyophilized solid.

Features:

- **Highest Quality Substrates:** Eliminate potential interference in assays due to the presence of endotoxins.
- **Assured Product Integrity:** Most products are packaged in amber vials with septa to ensure product integrity as well as offer ease of dilution and use for imaging experiments. Product is packaged with fine tolerances to minimize the need to weigh substrates.
- **Flexibility and Convenience:** Available in multiple sizes to accommodate a variety of experimental settings.

Storage Conditions: Store at –20°C.

EnduRen™ In Vivo *Renilla* Luciferase Substrate

Product	Size	Cat.#
EnduRen™ In Vivo *Renilla* Luciferase Substrate	0.34 mg	P1111
	3.4 mg	P1112

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: EnduRen™ in vivo *Renilla* Luciferase Substrate is a uniquely engineered coelenterazine-based compound with protected oxidation sites. These modifications are designed to minimize substrate degradation and autoluminescence. It is reported that EnduRen™ Substrate may have a longer kinetic output when compared to the native coelenterazine substrate when used in an in vivo imaging application in a mouse model.

Features:

- **Highest Quality Substrates:** Eliminate potential interference in assays due to the presence of endotoxins.
- **Assured Product Integrity:** Most products are packaged in amber vials with septa to ensure product integrity as well as offer ease of dilution and use for imaging experiments. Product is packaged with fine tolerances to minimize the need to weigh substrates.
- **Flexibility and Convenience:** Available in multiple sizes to accommodate a variety of experimental settings.

Storage Conditions: Store at –20°C.

VivoGlo™ Luciferin-β-Galactosidase Substrate (6-O-β-galactopyranosyl luciferin)

Product	Size	Cat.#
VivoGlo™ Luciferin-β-Galactoside Substrate (6-O-β-galactopyranosyl luciferin)	50 mg	P1061
	250 mg	P1062

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Luciferin-β-galactoside is a substrate for the commonly used reporter enzyme β-galactosidase. The substrate is cleaved by β-galactosidase to form luciferin and galactose. When used in a model system expressing firefly luciferase, the luciferin is then utilized in a firefly luciferase reaction to generate light.

Features:

- **Highest Quality Substrates:** Eliminate potential interference in assays due to the presence of endotoxins.
- **Assured Product Integrity:** Most products are packaged in amber vials with septa to ensure product integrity as well as offer ease of dilution and use for imaging experiments. Product is packaged with fine tolerances to minimize the need to weigh substrates.
- **Flexibility and Convenience:** Available in multiple sizes to accommodate a variety of experimental settings.

Storage Conditions: Store at –20°C.

VivoGlo™ Luciferin, In Vivo Grade

Product	Size	Cat.#
VivoGlo™ Luciferin, In Vivo Grade	50 mg	P1041
	250 mg	P1042
	1 g	P1043

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Luciferase genes from the North American firefly (*Photinus pyralis*) and from other beetles are commonly used as light-emitting reporters in cellular and animal models. VivoGlo™ Luciferin is the potassium salt of D-luciferin, the firefly luciferase substrate capable of generating light when a suitable model is used.

Features:

- **Highest Quality Substrates:** Eliminate potential interference in assays due to the presence of endotoxins.
- **Assured Product Integrity:** Most products are packaged in amber vials with septa to ensure product integrity as well as offer ease of dilution and use for imaging experiments. Product is packaged with fine tolerances to minimize the need to weigh substrates.
- **Flexibility and Convenience:** Available in multiple sizes to accommodate a variety of experimental settings.

Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system

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Available in the Helix® on-site stocking system

HaloTag® Fusion (C-Terminal) Mammalian Expression Vectors

Product	Size	Cat.#
pHTC HaloTag® CMV-neo Vector	20 µg	G7711
pFC27A HaloTag® CMV-neo Flexi® Vector	20 µg	G8421
pFC27K HaloTag® CMV-neo Flexi® Vector	20 µg	G8431
pFC14A HaloTag® CMV Flexi® Vector	20 µg	G9651
pFC14K HaloTag® CMV Flexi® Vector	20 µg	G9661
pFC15A HaloTag® CMV*d1* Flexi® Vector	20 µg	G1611
pFC15K HaloTag® CMV*d1* Flexi® Vector	20 µg	G1601
pFC16A HaloTag® CMV*d2* Flexi® Vector	20 µg	G1591
pFC16K HaloTag® CMV*d2* Flexi® Vector	20 µg	G1571
pFC17A HaloTag® CMV*d3* Flexi® Vector	20 µg	G1551
pFC17K HaloTag® CMV*d3* Flexi® Vector	20 µg	G1321

For Research Use Only. Not for Use in Diagnostic Procedures.

HaloTag® Fusion (N-Terminal) Mammalian Expression Vectors

Product	Size	Cat.#
pHTN HaloTag® CMV-neo Vector	20 µg	G7721
pFN28A HaloTag® CMV-neo Flexi® Vector	20 µg	G8441
pFN28K HaloTag® CMV-neo Flexi® Vector	20 µg	G8451
pFN21A HaloTag® CMV Flexi® Vector	20 µg	G2821
pFN21K HaloTag® CMV Flexi® Vector	20 µg	G2831
pFN22A HaloTag® CMV*d1* Flexi® Vector	20 µg	G2841
pFN22K HaloTag® CMV*d1* Flexi® Vector	20 µg	G2851
pFN23A HaloTag® CMV*d2* Flexi® Vector	20 µg	G2861
pFN23K HaloTag® CMV*d2* Flexi® Vector	20 µg	G2871
pFN24A HaloTag® CMV*d3* Flexi® Vector	20 µg	G2881
pFN24K HaloTag® CMV*d3* Flexi® Vector	20 µg	G2981

For Research Use Only. Not for Use in Diagnostic Procedures.

pGL4 in vivo Imaging Vectors

Product	Size	Cat.#
pGL4.50[*luc2*/CMV/Hygro] Vector	20 µg	E1310
pGL4.51[*luc2*/CMV/Neo] Vector	20 µg	E1320

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The pGL4 Luciferase Reporter Vectors are the next generation of reporter gene vectors optimized for expression in mammalian cells. Numerous configurations of pGL4 Vectors are available. The pGL4.50 and pGL4.51 Vectors offer the synthetic firefly luciferase *luc2* gene under the control of the strong constitutive CMV (cytomegalovirus) promoter. These vectors have demonstrated high expression levels in a variety of cell lines tested. The addition of a selectable marker, either hygromycin or neomycin, also allows the creation of stable cell lines. Cell lines with constant expression of luciferase can be used in animal models to study in vivo changes in cell physiology.

Features:

- Pre-built luciferase expression vector.
- *Luc2* luciferase gene provides highest expression.
- Selectable markers for generating stable cell lines.

Storage Conditions: Store at –20°C.

Anti-ACTIVE® JNK pAb, Rabbit, (pTPpY)

Product	Size	Cat.#
Anti-ACTIVE® JNK pAb, Rabbit, (pTPpY)	40 µl	V7931
	120 µl	V7932

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Anti-ACTIVE® JNK pAb is a polyclonal antibody from rabbit serum. The antibody is affinity purified using a dually phosphorylated peptide that corresponds to the active form of the JNK enzymes.

Features:

- **Specificity:** Preferentially detects the dually phosphorylated, active form of the stress-activated protein kinase (SAPK), also known as c-Jun N-terminal kinase, JNK.
- **Immunogen:** Dually phosphorylated Thr/Pro/Tyr region (pTPpY) derived from the catalytic core of the active form of JNK kinase, which corresponds to Thr^{183} and Tyr^{185} of the mammalian JNK2 enzyme.
- **Antibody Form:** Affinity-purified rabbit IgG; supplied in 10mM sodium phosphate (pH 7.4), 20mM NaCl.
- **Value:** Anti-ACTIVE® JNK pAb is available in two convenient sizes. Cat.# V7931 will generate up to 200ml of blotting solution, sufficient for 20 Western blots of 10ml each. The larger size, Cat.# V7932, will generate up to 600ml of blotting solution, sufficient for 60 Western blots of 10ml each.

Storage Conditions: Store at –20°C.

Anti-ACTIVE® MAPK pAb, Rabbit, (pTEpY)

Product	Size	Cat.#
Anti-ACTIVE® MAPK pAb, Rabbit, (pTEpY)	40 µl	V8031

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Anti-ACTIVE® MAPK pAb is a polyclonal rabbit antibody. The antibody is affinity purified using a dually phosphorylated peptide that corresponds to the active form of the mitogen-activated protein (MAP) kinase enzymes.

Features:

- **Specificity:** Preferentially detects the dually phosphorylated, active form of the mitogen-activated protein kinase (MAPK) enzymes (ERK1 and ERK2).
- **Immunogen:** Dually phosphorylated Thr/Glu/Tyr region (pTEpY) derived from the catalytic core of the active form of the mitogen-activated protein kinase (MAPK) enzymes, ERK1 and ERK2, which corresponds to Thr^{183} and Tyr^{185} of the mammalian ERK2 enzyme.
- **Antibody Form:** Affinity-purified rabbit IgG; supplied in PBS (pH 7.4).
- **Value:** When used at the recommended 1:5,000 dilution, this product will generate 200ml of blotting solution, sufficient for 20 Western blots of 10ml each.

Storage Conditions: Store at –20°C.

Anti-ACTIVE® Caspase-3 pAb

Product	Size	Cat.#
Anti-ACTIVE® Caspase-3 pAb	50 µl	G7481

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Anti-ACTIVE® Caspase-3 pAb is intended for use as a marker of apoptosis; it specifically stains apoptotic cells without staining nonapoptotic cells. Includes sufficient antibody to perform 125 immunocytochemical assays (100µl/assay) at a 1:250 dilution.

Features:

- **Immunogen:** Peptide derived from the p17 fragment of caspase-3 and having sequence homology in human, mouse, rat and hamster.
- **Antibody Form:** Affinity-purified rabbit IgG; supplied in Dulbecco's PBS.
- **Specificity:** Specifically recognizes the cleaved active form of caspase-3 in human, rat and mouse.

Storage Conditions: Store at –20°C.

Anti-β-Galactosidase mAb

Product	Size	Conc.	Cat.#
Anti-β-Galactosidase, Purified Monoclonal Antibody	100 µg	2.0–2.5 mg/ml	Z3781
	2 mg	2.0–2.5 mg/ml	Z3783

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: This antibody [subclass $IgG_{2a}(\kappa)$] was purified from ascites of a mouse hybridoma and recognizes *E. coli* β-galactosidase.

Features:

- **Immunogen:** β-galactosidase.
- **Antibody Form:** 2.0–2.5mg/ml in 10mM Tris-HCl (pH 8.0), 150mM NaCl, 0.02% sodium azide.
- **Specificity:** *E. coli* β-galactosidase near the C-terminal end.

Storage Conditions: Store undiluted at –20°C.

Anti-HaloTag® Monoclonal Antibody

Product	Size	Conc.	Cat.#
Anti-HaloTag® Monoclonal Antibody	200 µg	1 mg/ml	G9211
For Research Use Only. Not for Use in Diagnostic Procedures.			

Description: Anti-HaloTag® Monoclonal Antibody is a mouse monoclonal antibody raised against the HaloTag® protein, which can be used to detect HaloTag® fusion proteins by Western blotting. The HaloTag® platform addresses the need for flexibility in functional protein analysis for cell imaging, protein purification and protein pull-down applications.

Features:

- **Specific to HaloTag® Protein:** Little to no cross-reactivity with other non-HaloTag proteins.
- **More Sensitive Detection Over the Existing Anti-HaloTag® pAb:** Detect as low as 0.5–1ng of HaloTag® fusion protein by Western blot.

Storage Conditions: Store at –30°C to –10°C.

Anti-Luciferase pAb

Product	Size	Cat.#
Anti-Luciferase pAb	200 µg	G7451
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Anti-Luciferase pAb is a goat polyclonal antibody designed for use in immunocytochemistry and Western blot applications. Anti-Luciferase pAb can detect luciferase enzyme expression in situ.

Features:

- **Immunogen:** 61kDa recombinant luciferase from North American firefly (*Photinus pyralis*).
- **Antibody Form:** Goat polyclonal IgG at 1mg/ml in PBS containing 50µg/ml gentamicin.
- **Specificity:** Anti-Luciferase pAb is specific for firefly luciferase (*Photinus pyralis*) and does not cross-react with sea pansy (*Renilla reniformis*) luciferase.

Storage Conditions: Store at 4°C.

Anti-PARP p85 Fragment pAb

Product	Size	Cat.#
Anti-PARP p85 Fragment pAb	50 µl	G7341
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Poly (ADP-ribose) polymerase (PARP), a nuclear enzyme involved in DNA repair, is a well known substrate for caspase-3 cleavage during apoptosis. Anti-PARP p85 Fragment pAb is a rabbit polyclonal antibody specific for the p85 fragment of PARP that results from caspase cleavage of the 116kDa intact molecule and thus provides an in situ marker for apoptosis. The antibody is affinity-purified using a peptide that corresponds to a region of the p85 fragment of PARP. The PARP immunogen is a synthetic peptide, gly-val-asp-glu-val-ala-lys (GVDEVAK), representing the N terminus of the large C-terminal fragment of human PARP that results from caspase-3 cleavage. Each batch of antibody is quality assurance tested for use in immunostaining applications and contains sufficient antibody for 50 immunocytochemical reactions at the suggested working dilution of 1:100.

Features:

- **Immunogen:** N-terminal peptide from p85 fragment.
- **Antibody Form:** Affinity-purified rabbit polyclonal antibody provided in Dulbecco's PBS.
- **Specificity:** Specifically detects PARP p85 fragment in human, rat and bovine cells and tissues. Does not recognize the 116kDa intact PARP protein.

Storage Conditions: Store at –20°C.

Anti-Human p75 pAb

Product	Size	Cat.#
Anti-Human p75 pAb	200 µg	G3231
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The p75 neurotrophin receptor ($p75^{NTR}$), also known as low-affinity NGF receptor (LNGFR) and $p75^{LNGFR}$, binds nerve growth factor, brain-derived neurotrophic factor, neurotrophin-3 and neurotrophin-4 with varying specificities. $p75^{NTR}$ plays an important role in neurotrophic factor signaling including neuronal apoptosis. Anti-Human p75 pAb provides a valuable tool for understanding the role of $p75^{NTR}$ in neuronal death.

Features:

- **Immunogen:** Cytoplasmic domain of the human p75 neurotrophin receptor.
- **Antibody Form:** Purified rabbit IgG; 1mg/ml in PBS containing 50µg/ml gentamicin.
- **Specificity:** Human, rat, mouse and chicken p75.

Storage Conditions: Store at 4°C.

Anti-βIII Tubulin mAb

Product	Size	Cat.#
Anti-βIII Tubulin mAb	100 µg	G7121

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Anti-βIII Tubulin mAb is a protein G-purified IgG_1 monoclonal antibody (from clone 5G8) raised in mice against a peptide (EAQGPK) corresponding to the C terminus of βIII tubulin. It is directed against βIII tubulin, a specific marker for neurons. The major use of this antibody is for labeling neurons in tissue sections and cell culture. The antibody has been tested to perform in frozen and paraffin-embedded sections of rat brain, cerebellum and spinal cord, human and rat fetal CNS progenitor cell cultures and adult human paraffin-embedded brain.

Features:

- **Immunogen:** Peptide corresponding to the C terminus (EAQGPK) of βIII tubulin.
- **Antibody Form:** Mouse monoclonal IgG_1 (clone 5G8), 1mg/ml in PBS containing no preservatives.
- **Specificity:** Cross-reacts with most mammalian species. Does not label nonneuronal cells (e.g., astrocytes).

Storage Conditions: Store at 4°C.

Alkaline Phosphatase-Conjugated Antibodies

Product	Size	Cat.#
Anti-Mouse IgG (H+L), AP Conjugate	100 µl	S3721
Anti-Rabbit IgG (Fc), AP Conjugate	100 µl	S3731
Anti-Human IgG (H+L), AP Conjugate	100 µl	S3821
Donkey Anti-Goat IgG, AP	60 µl	V1151

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Polyclonal secondary antibodies raised in goat or donkey, immunoaffinity-purified using corresponding immobilized antigens and conjugated to alkaline phosphatase (AP) enzyme. The products (unless otherwise noted) are supplied as 1mg/ml solutions. The **Anti-Mouse IgG (H+L), AP Conjugate** antibody binds to both heavy and light chains for all IgG subclasses. The **Anti-Rabbit IgG (Fc), AP Conjugate** antibody reacts with the heavy chains of rabbit IgG but not with the light chains. The **Anti-Human IgG (H+L), AP Conjugate** antibody reacts with heavy and light chains of all subclasses of human IgG as well as with light chains on other human immunoglobulins; it displays minimal cross-reactivity to horse or bovine serum proteins. As with all antibodies, in certain applications some species-dependent antigen-dependent cross-reactivity may be observed. A starting working dilution of 1:2,500 is suggested for most Western blot, dot blot and ELISA applications. The optimum concentration of secondary antibody depends on the application and will need to be empirically determined.

Donkey Anti-Goat IgG, AP Conjugate is a secondary antibody developed in donkeys against goat IgG; it has been affinity-purified and conjugated to alkaline phosphatase.

Features:

- **Extensive Validation:** Use with confidence, as supported by numerous publications.
- **Ready-to-Use Formulation:** No need to dissolve the antibody.
- **Flexible Dispensing:** We can readily accommodate large-scale custom orders. Please inquire at: **www.promega.com/custom/**

Storage Conditions: Store the Anti-Mouse IgG (H+L), AP Conjugate, Anti-Rabbit IgG (Fc), AP Conjugate, and Anti-Human IgG (H+L), AP Conjugate, at +2 to +10°C. Store the Donkey Anti-Goat IgG, AP at –30 to –10°C.

Horseradish Peroxidase-Conjugated Antibodies

Product	Size	Cat.#
Anti-Rabbit IgG (H+L), HRP Conjugate	300 µl	W4011
Anti-Mouse IgG (H+L), HRP Conjugate	300 µl	W4021
Anti-Human IgG (H+L), HRP Conjugate	300 µl	W4031
Donkey Anti-Goat IgG, HRP	60 µl	V8051

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Polyclonal secondary antibodies raised in goat, rabbit or donkey, immunoaffinity-purified using corresponding immobilized antigens and conjugated to horseradish peroxidase (HRP) enzyme. The **Anti-Human IgG (H+L), HRP Conjugate, Anti-Mouse IgG (H+L), HRP Conjugate and Anti-Rabbit IgG (H+L), HRP Conjugate** antibodies bind to both heavy and light chains for all IgG subclasses. As with all antibodies, in certain applications some species-dependent antigen-dependent cross-reactivity may be observed. The products (unless otherwise noted) are supplied as 1mg/ml solutions. A starting working dilution of 1:2,500 is suggested for most Western blot, dot blot and ELISA applications. The optimum concentration of secondary antibody depends on the application and will need to be empirically determined.

Donkey Anti-Goat IgG, HRP Conjugate is a secondary antibody developed in donkeys against goat IgG. Donkey Anti-Goat IgG, HRP Conjugate shows reactivity to goat and sheep IgG but minimal cross-reactivity to rabbit and mouse IgG. For Western blot applications with chromogenic detection use at a starting dilution of 1:10,000.

Features:

- **Extensive Validation:** Use with confidence, as supported by numerous publications.
- **Ready-to-Use Formulation:** No need to dissolve the antibody.
- **Flexible Dispensing:** We can readily accommodate large-scale custom orders. Please inquire at: **www.promega.com/custom/**

Storage Conditions: Store the unopened product at –20°C. Store opened Anti-Human IgG (H+L), HRP Conjugate, Anti-Mouse IgG (H+L), HRP Conjugate and Anti-Rabbit IgG (H+L), HRP Conjugate at 4°C.

Available in the Helix® on-site stocking system

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TMB One Solution

Product	Size	Cat.#
TMB One Solution	100 ml	G7431
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: TMB One Solution is a chromagen substrate, 3,3′,5,5′-tetramethylbenzidine (TMB) provided in a mildly acidic, nonhazardous buffer for horseradish peroxidase detection in an ELISA format. The substrate is provided as a single solution at a ready-to-use working dilution. The substrate develops a blue reaction product when oxidized by peroxidase and a yellow reaction product in an endpoint multiwell assay after the addition of an acid solution provided by the end user.

Features:

- **Convenient:** Single solution provided ready-to-use; just add, incubate, stop and read. This homogeneous reagent improves assay variation.
- **Stable:** Stable for 12 months at 4°C, providing extended shelf life; the assay end product is stable for at least one hour after stopping the assay.
- **Safe:** Provided in a slightly acidic, nonhazardous proprietary buffer without aprotic solvents; noncaustic to plastics used in automated systems.
- **Sensitive:** Low background provides greater assay sensitivity.

Storage Conditions: Store at 4°C protected from light.

Available in the Helix® on-site stocking system

Anti-HaloTag® pAb

Product	Size	Conc.	Cat.#
Anti-HaloTag® pAb	200 µg	1 mg/ml	G9281
For Research Use Only. Not for Use in Diagnostic Procedures.			

Description: The Anti-HaloTag® pAb is a purified rabbit polyclonal antibody raised against the HaloTag® protein. The antibody is purified using Protein G affinity resin and supplied at 1mg/ml in PBS. The antibody detects HaloTag® fusion proteins in Western blot hybridization and immunocytochemistry applications with high sensitivity and specificity. The HaloTag® protein is not endogenous to mammalian, plant and *E. coli* cells. *E. coli* and mammalian cell extracts demonstrate low cross-reactivity with the Anti-HaloTag® pAb.

Features:

- **Specificity:** The Anti-HaloTag® pAb is specific for HaloTag® protein and exhibits low cross-reactivity with *E. coli* and mammalian cell extracts.

Storage Conditions: Store at –20°C.

Promega

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Luciferase Assays

Luciferase Assays

Products tagged with the Helix® icon are available for distribution through our convenient on-site stocking program in a freezer, refrigerated unit or an ambient cabinet.

For more information visit: **www.promega.com/helix**

Available in the Helix® on-site stocking system

Reporter Assays

Nano-Glo® In-Gel Detection System

Product	Size	Cat.#
Nano-Glo® In-Gel Detection System	10ml	N3020
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The Nano-Glo® In-Gel Detection System eliminates the need for immunoblotting to detect NanoLuc® fusion proteins separated by polyacrylamide gel electrophoresis, allowing direct imaging of proteins within gels. For native PAGE, the gels can be incubated with detection reagent and imaged in less than 15 minutes. For denaturing SDS-PAGE, two washes with 25% isopropanol followed by two washes in water are needed to remove the SDS and allow the NanoLuc® luciferase to refold before detection.

The sensitivity of NanoLuc® luciferase means proteins do not need to be overexpressed to be visualized by the Nano-Glo® In-Gel Detection System.

Easily detect NanoLuc® protein fusions to:

- Verify expression levels
- Confirm correct molecular weight
- Multiplex measurements of multiple luminescent species

Features:

- Simply incubate native or SDS denaturing gels with reagent and image
- No transfer to membranes required for detection
- Eliminates the need for blocking or antibodies

Storage Conditions: Store at –30°C to –10°C.

HiBiT Control Protein

Product	Size	Cat.#
HiBiT Control Protein	100µl	N3010
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The HiBiT Control Protein is a 20µM solution of purified recombinant 36kDa HaloTag® protein fused at its carboxy terminus to the 11-amino-acid HiBiT tag. The HiBiT Control Protein can be used as a positive control of known concentration when using the Nano-Glo® HiBiT Lytic Detection System (Cat.# N3030, N3040, N3050), Nano-Glo® HiBiT Extracellular Detection System (Cat.# N2420, N2421, N2422) or Nano-Glo® HiBiT Blotting System (Cat.# N2410).

Features:

- A 20µM control protein
- Use as a positive control with the Nano-Glo® HiBiT Detection and Blotting Systems

Storage Conditions: Store at –30°C to –10°C.

Nano-Glo® Live Cell Assay System

Product	Size	Cat.#
Nano-Glo® Live Cell Assay System	100 assays	N2011
	1,000 assays	N2012
	10,000 assays	N2013
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The Nano-Glo® Live Cell Assay System is a single-addition, nonlytic detection reagent used to measure NanoBiT® or NanoLuc® luminescence from living cells. The reagent is prepared by diluting the Nano-Glo® Live Cell Substrate with the Nano-Glo® LCS Dilution Buffer to make the Nano-Glo® Live Cell Reagent, a 5X stock that is added directly to cell culture medium. Both substrate and buffer solutions are optimized to provide enhanced stability. The Nano-Glo® Live Cell Reagent is designed to reduce autoluminescence in the presence or absence of serum, increasing the sensitivity for detection of low levels of NanoBiT® or NanoLuc® luminescence. The Nano-Glo® Live Cell Assay System can be used to monitor luminescence at a user-defined time point or continuously for up to 2 hours without compromising cell viability.

Storage Conditions: Nano-Glo® LCS Dilution Buffer may be thawed and stored at room temperature. Store all other components at –30°C to –10°C.

Nano-Glo® Luciferase Assay System

Product	Size	Cat.#
Nano-Glo® Luciferase Assay	10 ml	N1110
	100 ml	N1120
	10 × 10 ml	N1130
	10 × 100 ml	N1150

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Nano-Glo® Luciferase Assay System provides a simple, single-addition reagent that generates a glow-type signal in the presence of NanoLuc® luciferase. The signal half-life is approximately 120 minutes in commonly used tissue culture media. The reagent, which contains an integral lysis buffer, is prepared by mixing Nano-Glo® Luciferase Assay Substrate and Nano-Glo® Luciferase Assay Buffer. The lysis buffer allows use of the reagent either directly on cells expressing NanoLuc® luciferase or the culture media when luciferase is secreted.

Nano-Glo® Luciferase Assay Reagent is a dedicated product for the detection of NanoLuc® Luciferase.

Features:

- **Advanced Reporter System:** Bright NanoLuc® reporter enables use in challenging applications where sensitivity is limited.
- **Simplified Assay Optimization:** Add-and-read simplicity enables scaling from bench to HTS.
- **Improved Assay Precision:** No need for separate lysis and reagent injection steps.
- **Brighter, Longer-Lasting Signal:** Extended bright light output is optimized for batch and continuous-process handling.
- **Greater Sensitivity:** Low background formulation offers increased sensitivity.

Nano-Glo® Endurazine™ and Vivazine™ Live Cell Substrates

Product	Size	Cat.#
Nano-Glo® Endurazine™ Live Cell Substrate	0.1ml	N2570
	1ml	N2571
	10ml	N2572
Nano-Glo® Vivazine™ Live Cell Substrate	0.1ml	N2580
	1ml	N2581
	10ml	N2582
Nano-Glo® Extended Live Cell Substrate Trial Pack	0.2ml	N2590

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Live-cell, nonlytic assays using the Nano-Glo® Live Cell Assay System are limited to ≤2 hours because of signal decay. The Nano-Glo® Endurazine™ and Vivazine™ Live Cell Substrates provide alternative live-cell-detection methods for NanoLuc® and NanoBiT® luciferases that enable nonlytic assays for periods lasting several hours to days. For both substrates, a slow rate of ester hydrolysis leads to the steady release of furimazine throughout the experiment, a process catalyzed by cellular esterases. Once formed, furimazine serves as a substrate for NanoLuc® and NanoBiT® luciferases.

The Vivazine™ substrate typically shows increased brightness but also an increased rate of signal decay compared to the Endurazine™ substrate. The Endurazine™ substrate will provide the maximum signal stability but lower initial signal intensity compared to the other Nano-Glo® Live Cell Substrates. Evaluate both substrates to determine which combination of signal intensity and stability is most suitable for your experiment [e.g., Nano-Glo® Extended Live Cell Substrate Trial Pack (Cat.# N2590)].

Features:

- Increased signal stability for extended real-time kinetic analysis of reporter activity
- Simplify time course studies by measuring response in the same sample over time
- Sensitivity to measure protein at endogenous levels—no overexpression required

Storage Conditions: Store at –30°C to –10°C.

Available in the Helix® on-site stocking system
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Nano-Glo® Dual-Luciferase® Reporter Assay System

Product	Size	Cat.#
Nano-Glo® Dual-Luciferase® Reporter Assay System	10 ml	N1610
	10 × 100 ml	N1650
	100 ml	N1620
	10 × 10 ml	N1630
Available Separately		
Nano-Glo® Dual-Luciferase® Reporter Assay/pNL1.1.TK Bundle	1 each	N1521
Nano-Glo® Dual-Luciferase® Reporter Assay/pNL1.1.PGK Bundle	1 each	N1531
Nano-Glo® Dual-Luciferase® Reporter Assay/pGL4.54[*luc2*/TK] Bundle	1 each	N1541
Nano-Glo® Dual-Luciferase® Reporter Assay/pGL4.53[*luc2*/PGK] Bundle	1 each	N1551
NanoDLR/pNL1.1.TK Helix® Bundle	1 each	N1561
Passive Lysis 5X Buffer	30 ml	E1941

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Nano-Glo® Dual-Luciferase® Reporter (NanoDLR™) Assay System is a homogeneous reagent system that enables you to sequentially detect the activities of firefly (*Photinus pyralis*) luciferase and NanoLuc® luciferase (Nluc) from a single sample. The firefly luciferase (Fluc) activity is measured first using ONE-Glo™ EX Luciferase Assay Reagent. NanoDLR™ Stop & Glo® Reagent is added to quench the firefly signal and provide the furimazine substrate needed to measure Nluc activity. This convenient "add-read-add-read" format generates stable glow-type luminescent signals for both reporters directly from cells with no lysis or cell preconditioning steps required.

Potent Fluc inhibition coupled with the high-intensity Nluc luminescence create a dual assay in which both reporters have maximum sensitivity in an assay format that is easy-to-use and flexible. The NanoDLR™ workflow is compatible with assays or screens in any plate size, supports batch processing, and is ideal for any luminometer with no specific filter or injector requirements. Excellent signal separation allows use of Nluc, Fluc or both as the dynamic experimental reporter. Co-reporter control vectors expressing either Nluc or Fluc from a variety of promoters are available individually or can be obtained in reagent/vector bundles that provide the NanoDLR™ reagent with the TK or PGK control vector of choice for simple adoption of the NanoDLR™ Assay.

The ONE-Glo™ EX Luciferase Assay Reagent is also available individually, allowing use of the same firefly luciferase reagent in both single and dual assays. The reconstituted reagent has increased stability at room temperature and 4°C, simplifying repeat use over long experiments and reducing waste.

Features:

- **Experience Improved Assay Performance:** Better quenching of the Fluc signal and the bright Nluc co-reporter in a homogeneous assay format with stable signal kinetics for convenient "add-read-add-read" processing.
- **Achieve Greater Sensitivity:** An *Nluc* signal up to 1,000 times brighter than *Renilla* luciferase and efficient separation of the Nluc and Fluc signals allow greater sensitivity, improved signal:background ratios and two independent reporters at full dynamic range.
- **Choose Your Assay Configuration:** Use either Fluc or Nluc as the experimental reporter with the other as an internal normalization control, or multiplex with two experimental reporters for maximum data or expanded applications.
- **Notice Improved Ease-of-Use:** Optimized reagents have greater stability, reducing requirements to aliquot and freeze, offer reduced reagent odor, and demonstrate decreased sensitivity to culture components.
- **Take Advantage of Workflow Flexibility:** Designed as an "add-read-add-read" assay that can be used directly on cells; also compatible with injection-based protocols and cell lysates allowing use with any plate size up to 1,536-well format with minimal instrument limitations.

Storage Conditions: Store the Nano-Glo® Dual-Luciferase® Reporter Assay System components at –30°C to –10°C. Please refer to the Technical Manual for other short-term storage options.

Dual-Glo® Luciferase Assay System

Product	Size	Cat.#
Dual-Glo® Luciferase Assay System	10 ml	E2920
	100 ml	E2940
	10 × 100 ml	E2980

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Dual-Glo® Luciferase Assay System is a homogeneous reagent system that enables fast and simple quantitation of a stable luminescent signal from two reporter genes in a single sample. This convenient "add-and-read" system generates both firefly and *Renilla* luciferase luminescence signals from cells that have not been preconditioned or prelysed. The Dual-Glo® Luciferase Assay System provides high Z′-factors for cell-based, high-throughput screening applications. With the Dual-Glo® System, internal controls can be established to minimize sample variability by reducing false-positive and false-negative readings caused by nonspecific factors such as cytotoxicity. In the Dual-Glo® Luciferase Assay, the activity of the primary reporter is correlated with the effect of specific stimuli, and the activity of the co-transfected control reporter provides an internal control to normalize results. The system is optimized for batch processing both 96- and 384-well plates and is compatible with a wide variety of mammalian cell culture media.

Features:

- **Increased Precision and Accuracy:** Normalize primary reporter results with an internal control, a co-reporter that minimizes effects of cell number and health, transfection efficiency and nonspecific cellular responses.
- **Homogeneous Format:** Perform fewer steps. Assay cells directly in growth medium for both reporters. No centrifugation or lysis steps required.
- **Stable Signal:** Obtain flexibility for either batch or continuous processing of 96- and 384-well plates. Each luminescent signal can be measured for up to 2 hours after reagent addition.
- **Convenience:** Screen efficiently with simple, two-step assay ideal for any luminometer. On-board injectors not required.
- **Wide Dynamic Range:** Analyze high and low reporter activity without sample dilution. Linear over at least 6 logs of enzyme concentration for each reporter.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store Dual-Glo® Substrates at –20°C. Store Dual-Glo® Buffers below 25°C.

Dual-Luciferase® Reporter Assay System

Product	Size	Cat.#
Dual-Luciferase® Reporter Assay System	100 assays	E1910
Dual-Luciferase® Reporter Assay System 10-Pack	1,000 assays	E1960
Dual-Luciferase® Reporter 1000 Assay System	1,000 assays	E1980
Available Separately		
Passive Lysis 5X Buffer	30 ml	E1941

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Dual-Luciferase® Reporter (DLR™) Assay System provides an efficient means of performing two reporter assays. In the DLR™ Assay, the activities of firefly (*Photinus pyralis*) and *Renilla* (*Renilla reniformis* or sea pansy) luciferases are measured sequentially from a single sample. The firefly luciferase reporter is measured first by adding Luciferase Assay Reagent II (LAR II) to generate a luminescent signal lasting at least one minute. After quantifying the firefly luminescence, this reaction is quenched, and the *Renilla* luciferase reaction is initiated simultaneously by adding Stop & Glo® Reagent to the same sample. Both assays can be completed in about 4 seconds using a luminometer with reagent auto-injectors. In the DLR™ Assay System, both reporters yield linear assays with attomole ($<10^{-18}$) sensitivities and no endogenous activity in the experimental host cells. Furthermore, the integrated format of the DLR™ Assay provides rapid quantitation of both reporters either in transfected cells or in cell-free transcription/translation reactions.

For best results with the Dual-Luciferase® Assay, we recommend using a luminometer that has been validated for use with the assay. These luminometers are qualified as DLR*ready*™. For a listing of qualified instruments, please visit the DLR*ready*™ Validated Luminometers page.

The pGL4 Luciferase Reporter Vectors are designed for use with the DLR™ Assay Systems. A *Renilla* luciferase vector with constitutive expression may be used in combination with any experimental firefly luciferase vector to co-transfect mammalian cells.

Notice for Cat.# E1960 and E1980: Sufficient Passive Lysis Buffer is provided to perform 1,000 assays with cells grown in 96-well plates (typically 20µl of 1X PLB per well). For applications requiring more lysis reagent (e.g., >100µl/well), additional Passive Lysis Buffer may be purchased separately.

Features:

- **Greater Accuracy:** *Renilla* luciferase internal control allows more accurate results.
- **Convenience:** Samples don't have to be split; saves plates and time.
- **Sensitivity:** Allows study of weak promoters, low-level expression/regulation and expression in cells that transfect poorly.
- **Linearity:** Range extends 7 logs; very active samples typically do not need dilution.

Storage Conditions: Store at –20°C.

ADCC Bioassays

Product	Size	Cat.#
ADCC Reporter Bioassay, Complete (Raji)	1 each	G7015
ADCC Reporter Bioassay, Complete (WIL2-S)	1 each	G7014
ADCC Reporter Bioassay, Core Kit	1 each	G7010
ADCC Reporter Bioassay, Target (Raji)	1 each	G7016
ADCC Reporter Bioassay, Target (WIL2-S)	1 each	G7013
ADCC Reporter Bioassay, Core Kit 5X	1 each	G7018
ADCC Bioassay Effector Cells, Propagation Model	1 each	G7102
ADCC Reporter Bioassay, F Variant, Core Kit	1 each	G9790
ADCC Reporter Bioassay, F Variant, Core Kit 5X	1 each	G9798
ADCC Bioassay Effector Cells, F Variant, Propagation Model	1 each	G9302

G7015, G7014, G7010, G7016, G7013, G7018 For Research Use Only. Not for Use in Diagnostic Procedures. G7102, G9790, G9798, G9302 Not For Medical Diagnostic Use.

For additional information see page 236.

Bio-Glo™ Luciferase Assay System

Product	Size	Cat.#
Bio-Glo™ Luciferase Assay System	100 ml	G7940
	10 ml	G7941

Not For Medical Diagnostic Use.

For additional information see page 233.

ONE-Glo™ EX Luciferase Assay System

Product	Size	Cat.#
ONE-Glo™ EX Luciferase Assay System	10 ml	E8110
	100 ml	E8120
	10 × 10 ml	E8130
	10 × 100 ml	E8150

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: High- or ultrahigh-throughput quantitation of firefly luciferase expression in mammalian cells is commonly performed by measuring luminescence from 96-, 384- or 1,536-well plates. The ONE-Glo™ EX Luciferase Assay System provides both the high sensitivity and long-lived luminescence required to batch-process multiple plates in these assay formats. The ONE-Glo™ EX Assay retains many of the beneficial aspects of the ONE-Glo™ Assay, using 5´-fluoroluciferin substrate with an add-mix-read, or homogeneous, protocol. Extending the properties of ONE-Glo™ Reagent, ONE-Glo™ EX Reagent employs a new assay chemistry to increase the stability of both the luminescence signal and the reconstituted reagent. The approximately 2-hour signal half-life provides greater flexibility in assay design. A reconstituted reagent that can be stored at room temperature for longer periods means less variability in reagent performance during long experiments or screens and less sample waste. ONE-Glo™ EX Reagent is the firefly luciferase detection reagent used in the Nano-Glo® Dual-Luciferase® Reporter (NanoDLR™) Assay System, allowing the same reagent to be used for single- or dual-luciferase assays.

Features:

- **Experience Improved Handling:** Increased stability of reconstituted reagent at room temperature or 4°C simplifies repeat use over long experiments and reduces waste; no odor-causing compounds in the reagent.
- **Achieve More Consistent Data:** Bright and stable signal that can be measured for hours enables more constant luminescence readings; ideal for screening and batch processing.
- **Take Advantage of Workflow Flexibility:** The homogenous firefly luciferase detection reagent can be used in both single- or dual-luciferase assays; compatible with any plate size up to 1,536-well format.
- **Notice Fewer Unwanted Effects from Sample Components:** Reduced sensitivity to culture media, phenol red and luciferase inhibitors compared to other luciferase assays.

Storage Conditions: Store the ONE-Glo™ EX Luciferase Assay reagents at –10°C to –30°C. Please refer to the Technical Manual for other short-term storage options.

ONE-Glo™ Luciferase Assay System

Product	Size	Cat.#
ONE-Glo™ Luciferase Assay System	10 ml	E6110
	100 ml	E6120
	1 L	E6130

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ONE-Glo™ Luciferase Assay System provides a highly sensitive, robust, homogeneous assay for detection of firefly luciferase reporter gene expression in mammalian cells. Ideally suited for high- and ultrahigh-throughput applications, the ONE-Glo™ Assay contains a new luciferase substrate, resulting in a reagent that is more stable, more tolerant to sample components, and has less odor than standard luciferase assay reagents. These features ensure that the ONE-Glo™ Assay provides robust performance and also eliminates many of the handling inconveniences experienced using other reporter assays in a high-throughput setting.

Features:

- **Simplified Assay Optimization:** Robust performance, reduced odor, improved storage and larger available sizes.
- **Room Temperature or 4°C Storage:** Extended stability of the ONE-Glo™ Reagent makes it more convenient for everyday use.
- **Improved Assay Precision:** The ONE-Glo™ Reagent is less sensitive to mixing and dispensing conditions, enhancing reproducibility. Ideal for use in high-density (384- and 1536-well) microplates.
- **Brighter, Longer-Lasting Signal:** Optimized for batch and continuous-process handling, the extended bright light output allows high sensitivity, especially for extended incubations.
- **Reduced Unwanted Effects from Sample Components:** The ONE-Glo™ Assay is less sensitive to culture media, phenol red and luciferase inhibitors than other luciferase assays.

Storage Conditions: Store the ONE-Glo™ Luciferase Assay System components at –20°C. Please refer to the Technical Manual for other storage options, including room-temperature storage.

ONE-Glo™ + Tox Luciferase Reporter and Cell Viability Assay

Product	Size	Cat.#
ONE-Glo™ + Tox Luciferase Reporter and Cell Viability Assay	1 plate	E7110
	10 plates	E7120

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ONE-Glo™ + Tox Assay combines luciferase assay chemistry with a cell viability marker to better understand reporter gene expression in the context of cell health. The assay uses a two-step, addition-only process to make these measurements in a single well of a plate, negating the need to run parallel assays.

The first part of the assay is a nonlytic fluorescence assay (CellTiter-Fluor™ Cell Viability Assay) that measures the relative number of live cells in a culture population after experimental manipulation. The CellTiter-Fluor™ Assay measures a conserved and constitutive protease activity within live cells and therefore serves as a marker of cell viability. The live-cell protease activity is restricted to intact viable cells and is measured using a fluorogenic, cell-permeant peptide substrate (glycylphenylalanyl-aminofluorocoumarin; GF-AFC). The substrate enters intact cells where it is cleaved by the live-cell protease to generate a fluorescent signal proportional to the number of living cells. This live-cell protease becomes inactive upon loss of cell membrane integrity and leakage into the surrounding culture medium. Fluorescence of the free AFC fluorophore is measured with a microplate reader or CCD imager using an excitation wavelength of 380–400nm and emission wavelength of 505nm.

The second part of the assay uses the ONE-Glo™ Luciferase Assay System to quantify firefly luciferase reporter gene expression from cells made to express this reporter enzyme. The ONE-Glo™ Luciferase Assay Buffer and ONE-Glo™ Luciferase Assay Substrate, provided with this system, are combined to form the ONE-Glo™ Reagent. Ideally suited for high- and ultrahigh-throughput applications, the ONE-Glo™ Assay contains a new fluoroluciferin substrate, resulting in a more stable reagent, that is more tolerant to sample components, and has less odor than standard luciferase assay reagents. Luminescence is measured with a microplate reader or CCD imager.

Features:

- **Acquire More Data:** Measure cell viability and firefly luciferase expression in the same assay well.
- **Better Biology:** Understand reporter gene expression in the context of cell viability.
- **Easy to Perform:** The assay uses a simple sequential "add-mix-read" format.
- **Flexible and Automation-Friendly:** The volumes of each assay component can be scaled to meet throughput needs, up to 1,536-well format.

Storage Conditions: Store the ONE-Glo™ + Tox Luciferase Reporter and Cell Viability Assay components at –20°C. Please refer to the Technical Manual for other storage options.

Steady-Glo® Luciferase Assay System

Product	Size	Cat.#
Steady-Glo® Luciferase Assay System	10 ml	E2510
	100 ml	E2520
	10 × 100 ml	E2550
Available Separately		
Steady-Glo® 1X Solution	550 ml	E3691

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: High-throughput quantitation of firefly (*Photinus pyralis*) luciferase expression in mammalian cells is commonly performed by batch processing of 96- and 384-well plates. Steady-Glo® Luciferase Assay System is designed for this purpose by providing long-lived luminescence when added to cultured cells. The homogeneous assay provides signal half-lives of over 5 hours in commonly used cell culture media without prior sample processing. Throughput rates of several thousand samples per hour may be achieved with high reproducibility under standard laboratory conditions.

Features:

- **Greater Light Output:** Greater assay sensitivity than other extended-lifetime firefly luciferase assay reagents.
- **Improved Assay Precision and Reproducibility:** Less sensitive to mixing conditions in multiwell plates. Particularly useful in 384-well plates.
- **Convenience:** Simply mix buffer with lyophilized substrate and add to cells in culture medium; no need to thaw or measure before use.
- **No Sample Preprocessing:** No need to remove culture medium or wash cells prior to adding assay reagent. Grow cells and assay them directly within the same multiwell plate.
- **Easy to Use:** Simply add reagent, which contains a cell lysis component, wait 5 minutes and measure luminescence.
- **Robust:** Compatible with many tissue culture media, including those containing up to 10% serum.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store Steady-Glo® Luciferase Assay Substrate at –20°C. Store Steady-Glo® Luciferase Assay Buffer below 25°C.

Available in the Helix® on-site stocking system
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Bright-Glo™ Luciferase Assay System

Product	Size	Cat.#
Bright-Glo™ Luciferase Assay System	10 ml	E2610
	100 ml	E2620
	10 × 100 ml	E2650

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: High-throughput quantitation of firefly (*Photinus pyralis*) luciferase expression in mammalian cells requires highly sensitive reagents that can adapt to continuous-process robotic systems. Bright-Glo™ Luciferase Assay System is designed specifically to meet the needs of continuous-process systems by providing robust, homogeneous assay chemistry that achieves high assay sensitivity and approximately 30-minute signal half-life without prior sample processing. These attributes also benefit those of you who are using fewer samples but still require high sensitivity and ease of use.

Features:

- **No Sample Preprocessing:** No need to remove culture medium or wash cells prior to adding assay reagent. Grow and assay cells directly in the same multiwell plate.
- **Increased Sensitivity:** Up to tenfold more light intensity than other homogeneous luciferase assay reagents.
- **Improved Assay Precision and Reproducibility:** Less sensitive to mixing conditions, sample evaporation and pipetting errors.
- **Convenience:** Simply mix buffer with lyophilized substrate and add to cells in culture medium; no need to thaw or measure before use.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store Bright-Glo™ Luciferase Assay Substrate at –20°C. Store Bright-Glo™ Luciferase Assay Buffer below 25°C.

Glo Lysis Buffer, 1X

Product	Size	Cat.#
Glo Lysis Buffer, 1X	100 ml	E2661

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Glo Lysis Buffer (GLB), 1X, is a proprietary formulation developed to promote rapid lysis (within 5 minutes) of cultured mammalian cells without scraping or performing freeze-thaw cycles. It is fully compatible with Bright-Glo™, Steady-Glo®, ONE-Glo™ and *Renilla*-Glo® Luciferase Assay Reagents and the Luciferase Assay Reagent for analysis of firefly luciferase expression. The half-life of these reagents remains the same with or without use of GLB, >5 hours for Steady-Glo® Reagent and >24 minutes for Bright-Glo™ Reagent.

Features:

- **Convenient:** No need for cell scraping or freeze-thaw cycles.
- **Fast:** Cell lysis within 5 minutes.
- **Versatile:** Use with Bright-Glo™, Steady-Glo®, ONE-Glo™ and *Renilla*-Glo® Luciferase Assay Reagents to provide nonhomogeneous assay formats or with other reporter applications.
- **Robust:** Firefly luciferase enzyme in Glo Lysis Buffer is stable at room temperature for at least 48 hours.

Storage Conditions: Store Glo Lysis Buffer at 4°C. For long-term storage, freeze Glo Lysis Buffer at –20°C or –70°C.

Luciferase Assay System

Product	Size	Cat.#
Luciferase Assay System	100 assays	E1500
Luciferase Assay System with Reporter Lysis Buffer	100 assays	E4030
Luciferase Assay System, 10-Pack	1,000 assays	E1501
Luciferase Assay System Freezer Pack	1,000 assays	E4530
Luciferase 1000 Assay System	1,000 assays	E4550
Luciferase Assay Reagent	100 ml	E1483
Available Separately		
Luciferase Cell Culture Lysis 5X Reagent	30 ml	E1531
Reporter Lysis 5X Buffer	30 ml	E3971

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Luciferase Assay System is an extremely sensitive and rapid reagent for quantitation of firefly luciferase. Linear results are seen over at least eight orders of magnitude of enzyme concentration, and patented technology incorporated in the formulation enables less than 10^{-20} moles of luciferase to be measured under optimal conditions. Generally, 100-fold greater sensitivity can be achieved over the chloramphenicol acetyltransferase (CAT) assay. The Luciferase Assay Reagent generates light that is nearly constant for at least 1 minute and so is compatible with measuring firefly luciferase in a single-tube luminometer or in a multiwell plate luminometer with an auto-injector.

The Luciferase Assay System is a nonhomogeneous assay system; the cells containing the luciferase must be lysed before reagent addition. Glo Lysis Buffer (Cat.# E2661), Cell Culture Lysis Reagent (Cat.# E1531), Passive Lysis Buffer (Cat.# E1941) and Reporter Lysis Buffer (Cat.# E3971) can be used with the Luciferase Assay System for reporter quantitation in mammalian cells. The Luciferase Assay System can also be used for quantitation in plant and bacterial cells, but only Cell Culture Lysis Reagent is suitable for these applications. Reporter Lysis Buffer enables firefly luciferase, CAT and β-galactosidase assays to be performed from the same cell extract. In some kits the lysis buffer is included, and in others it must be purchased separately.

Features:

- **Linear:** Eight or more orders of magnitude of enzyme concentration.
- **Sensitive:** To 10^{-20} moles of luciferase.
- **Fast:** Perform cell lysis, sample preparation and assays in as little as 5 minutes.
- **Convenient:** Reporter Lysis Buffer enables luciferase, CAT and β-galactosidase assays to be performed from the same cell extract.
- **Simple Assay Procedure:** Eliminates the need for autoinjection devices and rapid mixing protocols when using single-tube luminometers.
- **Versatile:** Luminometer preferred, but not required; adaptable to scintillation counters.
- **Safe:** Non-radioactive.
- **Superior:** High performance compared to competitors' luciferase assays.

Storage Conditions: Store system at –20°C. Store Cat.# E1483 at –70°C. Reporter Lysis Buffer (Cat.# E3971) may be stored at room temperature. Store Cat.# E2661 at 4°C. For long-term storage, freeze Cat.# E2661 at –20°C or –70°C.

Beetle Luciferin, Potassium Salt

Product	Size	Cat.#
Beetle Luciferin, Potassium Salt	5 mg	E1601
	50 mg	E1602
	250 mg	E1603
	1 g	E1605

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Luciferase genes from the North American firefly (*Photinus pyralis*) and from other beetles are commonly used as reporter genes for studying transcription regulation in transient assay systems and as markers for stably transformed eukaryotic cells. Beetle luciferin (also known as D-luciferin) is synthesized as the monopotassium salt and is a substrate for the beetle luciferase reporter systems. D-luciferin is provided for those researchers who prefer to formulate their own assay reagents for monitoring in vitro or in vivo luciferase activity.

Formula: $C_{11}H_7N_2O_3S_2$•K.

Formula Weight: 318.4 (anhydrous).

Features:

- **Formulation:** Supplied as a potassium salt for easy preparation in aqueous buffer.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –70°C.

Luciferin-EF™ Endotoxin-Free Luciferin Na

Product	Size	Cat.#
Luciferin-EF™	25 mg	E6551
	250 mg	E6552

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Luciferin-EF™ is an endotoxin-free beetle luciferin that can be used for cell-based imaging applications in living systems, where endotoxin may create problems. Luciferin-EF™ is tested to ensure endotoxin is below detectable levels and packaged in amber vials with septa to facilitate easy dilution and use.

Features:

- **Achieve Endotoxin Levels Below Detection Limits:** No potential interference in assay due to the presence of endotoxins.
- **Be Assured of Product Integrity:** Luciferin-EF™ is packaged in amber vials with septa to ensure product integrity as well as offer ease of dilution and use for imaging experiments.
- **Appreciate Flexibility and Convenience:** Luciferin-EF™ is available in two sizes, depending on the number of experiments to be performed.

Storage Conditions: Store at –70°C.

Renilla-Glo® Luciferase Assay System

Product	Size	Cat.#
Renilla-Glo® Luciferase Assay System	10 ml	E2710
	100 ml	E2720
	10 × 100 ml	E2750

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The *Renilla*-Glo® Luciferase Assay System is a single-addition reagent that generates a glow-type signal with *Renilla* luciferase. When reconstituted, it has the capacity to lyse cells, reduce the autoluminescence of the coelenterazine substrate, and produce a stable signal (i.e., half-life greater than 60 minutes at 22°C).

Features:

- **Simplify Your Assay Optimization:** Add-and-read simplicity for a *Renilla* luciferase reporter system.
- **Improve Assay Precision:** No need for separate lysis and reagent injection steps.
- **Get a Brighter, Longer-Lasting Signal:** Extended bright light output is optimized for batch and continuous-process handling.
- **Reduced Autoluminescence:** Low background formulation offers increased sensitivity.

Storage Conditions: Store at –20°C.

Renilla Luciferase Assay System

Product	Size	Cat.#
Renilla Luciferase Assay System	100 assays	E2810
	1,000 assays	E2820

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: *Renilla* Luciferase Assay System is designed to provide a fast and sensitive method of detecting luciferase from sea pansy (*Renilla reniformis*). The system is a convenient alternative to firefly (*Photinus pyralis*) reporter systems and is designed to yield reliable, linear results for a concentration range over 7 orders of magnitude. The *Renilla* Luciferase Assay System has been formulated with a proprietary composition that significantly reduces the effect of coelenterazine autoluminescence when compared to other reagents, making the reagent orders of magnitude more sensitive than published methods. This system enables measurements with wildtype and synthetic *hRluc* genes for primary expression or internal normalization measurements of gene expression.

Features:

- **Reduced Autoluminescence:** Low background, increased sensitivity.
- **Sensitive:** Can detect 10^{-19} moles of *Renilla* luciferase.
- **Linear:** Linear range extending 7 logs.
- **Unique:** The first independent assay system for *Renilla* luciferase.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store the *Renilla* Luciferase Assay System at –20°C.

Available in the Helix® on-site stocking system

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EnduRen™ Live Cell Substrate

Product	Size	Cat.#
EnduRen™ Live Cell Substrate	0.34 mg	E6481
	3.4 mg	E6482
	34 mg	E6485

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: EnduRen™ Live Cell Substrate enables live cell kinetic measurements, streamlining assay development and multiplexing with other lytic assays. EnduRen™ Live Cell Substrate provides the ability to measure *Renilla* luciferase luminescence for at least 24 hours after substrate addition, with up to tenfold higher signal-to-background ratios than wildtype coelenterazines.

EnduRen™ Live Cell Substrate is a uniquely engineered coelenterazine with protected oxidation sites, which minimizes substrate degradation and autoluminescence (background) in cell culture, while it extends the luminescent signal to accommodate microplates without the need for auto-injectors. The result is that EnduRen™ Live Cell Substrate overcomes the key limitations of wildtype coelenterazines by providing an automation-friendly, highly sensitive substrate for *Renilla* luciferase-based gene reporter and BRET applications.

Features:

- **Live Cell Assay:** Generate kinetic profiles for reporter gene, BRET and RNAi applications.
- **Kinetic Reporter Gene Analysis:** Conserve test compounds as you create response profiles in real time to generate more data-rich results.
- **Streamlined Assay Development and Screening:** Rapidly obtain optimal assay parameters through repeat measurements using only a single cell population. Increase your sample throughput using microplates without time-consuming per-sample reagent injection steps.
- **Designed for Multiplexing:** Perform more dynamic experiments using the same sample set by pairing with any lytic assay.
- **High Signal-to-Background Ratios:** Reliably quantitate low levels of expression for reporter gene detection and BRET.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –20°C.

ViviRen™ Live Cell Substrate

Product	Size	Cat.#
ViviRen™ Live Cell Substrate	0.37 mg	E6491
	3.7 mg	E6492
	37 mg	E6495

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: ViviRen™ Live Cell Substrate is a uniquely engineered coelenterazine that generates three- to fivefold brighter *Renilla* luciferase luminescence than wildtype coelenterazine. Using live cells, achieve up to 100-fold higher signal-to-noise ratios for super-sensitive quantitation of reporter gene, BRET and RNAi activity.

Cat.# E6491 is supplied as a liquid, 60mM in DMSO. Cat.# E6492 and E6495 are supplied as a lyophilized solid.

Features:

- **Three- to Fivefold Brighter *Renilla* Luminescence than Coelenterazine**: Quantitate with confidence using miniaturized formats, low-level expression and CCD imagers.
- **Low Autoluminescence:** Achieve unparalleled sensitivity with up to 100-fold higher signal-to-noise ratios than coelenterazine.
- **Live Cell Assay:** Generate kinetic profiles for reporter gene, BRET and RNAi applications.
- **Multiplex Options:** Improve accuracy and precision by combining with CellTiter-Glo® and other lytic assays.

Storage Conditions: Store Cat.# E6491 at –70°C. Store Cat.# E6492 and E6495 at –20°C.

Coelenterazines

Product	Size	Cat.#
Coelenterazine	250 µg	S2001
Coelenterazine-h	250 µg	S2011

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Luciferases from *Renilla*, *Aequorea* and other marine organisms are commonly used as indicators or reporters for studying cellular phenomena in expression assays in eukaryotic cells. *Renilla* luciferase is often used as a reporter of transcription regulation, whereas apoaequorin is often used as a calcium indicator. Other uses of coelenterazines include chemiluminescent detection of Reactive Oxygen Species (ROS) in cells or tissues. We offer the following coelenterazine analogs.

Coelenterazine (native) is the luminescent substrate for *Renilla* luciferase and apoaequorin. **Formula:** $C_{26}H_{21}N_3O_3$. **Formula Weight:** 423.5. **Form:** Film.

Coelenterazine-h imparts a luminescent intensity with its aequorin complex that is reported to be 10–20 times higher than that of native coelenterazine, making this derivative a useful tool for measuring small changes in Ca^{2+} concentrations. **Formula:** $C_{26}H_{21}N_3O_2$. **Formula Weight:** 407.5. **Form:** Film.

Features:

- **Highly Pure:** 95%.
- **Custom Capabilities:** Custom packaging and sizes available.
- **Easy to Prepare:** Supplied as a dried substrate for easy preparation in methanol or ethanol.
- **Choose Your Configuration:** Learn more about custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –20°C.

β-Galactosidase Enzyme Assay System with Reporter Lysis Buffer

Product	Size	Cat.#
β-Galactosidase Enzyme Assay System with Reporter Lysis Buffer	10 ml	E2000
Available Separately		
Reporter Lysis 5X Buffer	30 ml	E3971

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The β-Galactosidase Enzyme Assay System with Reporter Lysis Buffer is a convenient method for assaying β-galactosidase activity in lysates prepared from cells transfected with β-galactosidase reporter vectors such as the pSV-β-Galactosidase Control Vector.

The standard assay is performed by adding a dilute sample to an equal volume of Assay 2X Buffer that contains the substrate ONPG (*o*-nitrophenyl-β-D-galactopyranoside). Samples are incubated for at least 30 minutes, during which time the β-Galactosidase hydrolyzes the colorless substrate to *o*-nitrophenyl, which is yellow. The reaction can be terminated by addition of sodium carbonate, and the absorbance at 420nm is measured by spectrophotometry.

Features:

- **Safe:** Non-isotopic assay.
- **Versatile:** The assay can be used in a 96-well plate format.
- **Flexible:** Reporter Lysis Buffer allows firefly luciferase, CAT and β-galactosidase assays to be performed from the same cell extract.

Storage Conditions: Reporter Lysis Buffer can be stored at room temperature. Store other system components at –20°C.

QuantiLum® Recombinant Luciferase

Product	Size	Conc.	Cat.#
QuantiLum® Recombinant Luciferase	1 mg	10–15 mg/ml	E1701
	5 mg	10–15 mg/ml	E1702

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: QuantiLum® Recombinant Luciferase is a luciferase expressed from a cloned gene from the North American firefly (*Photinus pyralis*) that provides the reliability and dependability needed for performing research or producing kits using bioluminescence reagents to detect ATP or luciferin substrates. A recombinant source eliminates the possibility of seasonal and regional variability that may be found in luciferase purified from natural sources.

Features:

- **Value:** Product available in bulk for large orders to suit individual needs and requirements.
- **Reliable:** Long-term supply assurance.
- **Consistent:** Excellent lot-to-lot consistency.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –70°C. Avoid multiple freeze-thaw cycles.

Beta-Glo® Assay System

Product	Size	Cat.#
Beta-Glo® Assay System	10 ml	E4720
	100 ml	E4740
	10 × 100 ml	E4780

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Beta-Glo® Assay System is a homogeneous method of quantitating β-galactosidase expression in mammalian cells. The system provides a bright luminescent signal that is stable over several hours in commonly used cell culture medium without prior sample processing. The homogeneous assay procedure involves the addition of a single reagent directly to cells cultured in serum-supplemented medium. Throughput rates of several thousand samples per hour can be achieved with high reproducibility under standard laboratory conditions.

Features:

- **Bright Luminescent Signal:** Quantitate with confidence using low-volume formats or in samples with low-level expression.
- **Homogeneous Format:** Perform fewer steps. Add a single reagent directly to cells in growth medium.
- **Stable Signal:** Obtain flexibility and convenience when processing multiple plates.
- **Convenient:** Achieve optimal assay performance at room temperature.
- **Flexible:** Read the luminescent signal using any luminometer. Injectors are not required.
- **Choose Your Configuration:** Learn more about custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –20°C.

Genetic Reporter Vectors and Cell Lines

NanoLuc® Genetic Reporter Vectors

Product	Size	Conc.	Cat.#
pNL1.1[*Nluc*] Vector	20 µg		N1001
pNL1.2[*NlucP*] Vector	20 µg		N1011
pNL1.3[*secNluc*] Vector	20 µg		N1021
pNL3.1[*Nluc*/minP] Vector	20 µg		N1031
pNL3.2[*NlucP*/minP] Vector	20 µg		N1041
pNL3.3[*secNluc*/minP] Vector	20 µg		N1051
pNL2.1[*Nluc*/Hygro] Vector	20 µg		N1061
pNL2.2[*NlucP*/Hygro] Vector	20 µg		N1071
pNL2.3[*secNluc*/Hygro] Vector	20 µg		N1081
pNL1.1.CMV[*Nluc*/CMV] Vector	20 µg		N1091
pNL1.3.CMV[*secNluc*/CMV] Vector	20 µg		N1101
pNL3.2.NF-κB-RE[*NlucP*/NF-κB-RE/Hygro] Vector	20 µg		N1111
pNL3.2.CMV Vector	20 µg	1 µg/µl	N1411
pNL1.1.PGK[*Nluc*/PGK] Vector	20 µg		N1441
pNL1.1.TK[*Nluc*/TK] Vector	20 µg		N1501

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: NanoLuc® (Nluc) luciferase is a small enzyme (19.1kDa) engineered for optimal performance as a luminescent reporter. The enzyme is about 100-fold brighter than either firefly (*Photinus pyralis*) or *Renilla reniformis* luciferase using a novel substrate, furimazine, to produce high intensity, glow-type luminescence. The luminescent reaction is ATP-independent and designed to suppress background luminescence for maximal assay sensitivity.

For use as a genetic reporter, multiple forms of NanoLuc® luciferase have been configured to meet differing experimental objectives. Unfused Nluc offers maximal light output and sensitivity, NanoLuc®-PEST (NlucP) closely couples protein expression to changes in transcriptional activity and increased signal-to background ratios, and NanoLuc® luciferase fused to an N-terminal secretion signal (secNluc) is suitable when a secreted reporter is preferred. Luminescence is linearly proportional to the amount of NanoLuc® protein over a 1,000,000-fold concentration range, with a signal half-life ≥2 hours when detected with Nano-Glo® Luciferase Assay Reagent.

NanoLuc® luciferase has a number of physical properties that make it an excellent reporter protein:

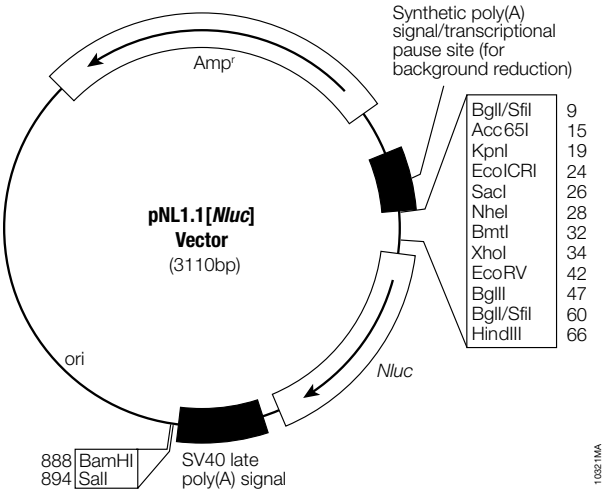
- very small, monomeric enzyme (171 amino acids; 513bp)
- high thermal stability (T_m = 60°C)
- active over a broad pH range (pH 6–8)
- no post-translational modifications or disulfide bonds
- uniform distribution in cells
- emission spectrum well suited for bioluminescence resonance energy transfer (BRET; λ_{max} = 465nM).

NanoLuc® luciferase is made available in a variety of plasmids designed for use in reporter gene assays of transcriptional control and with each of the NanoLuc® forms (unfused Nluc, PEST destabilized NlucP, and secreted secNluc). The different pNL variations are designed for the following:

- pNL1: cloning of a known or putative promoter region
- pNL2: cloning of a known or putative promoter region and establishment of a stable cell line through Hygromycin selection
- pNL3: cloning of a binding site or response element not in need of a basic promoter (such as are present in the pNL3.2.NF-κB-RE vector)
- Control plasmids for the unfused, PEST-destabilized and secreted Nluc forms also are available.

The pNL vector series use a pGL4-based backbone for easy sequence transfer from existing plasmids. This backbone design also reduces anomalous results by removing many transcription factor binding sites and other potential regulatory elements. The Nluc gene variations are codon optimized and have had many potential regulatory elements or other undesirable features removed (such as common restriction enzyme sites).

Storage Conditions: Store at –20°C.



NanoLuc® Protein Fusion Vectors

Product	Size	Conc.	Cat.#
pFN31A *Nluc* CMV-Hygro Flexi® Vector	20 µg	1 µg/µl	N1311
pFN31K *Nluc* CMV-neo Flexi® Vector	20 µg	1 µg/µl	N1321
pFC32A *Nluc* CMV-Hygro Flexi® Vector	20 µg	1 µg/µl	N1331
pFC32K *Nluc* CMV-neo Flexi® Vector	20 µg	1 µg/µl	N1341
pNLF1-N [CMV/Hygro] Vector	20 µg	1 µg/µl	N1351
pNLF1-C [CMV/Hygro] Vector	20 µg	1 µg/µl	N1361
pNLF1-secN [CMV/Hygro] Vector	20 µg	1 µg/µl	N1371
Transfection Carrier DNA	5 × 20 µg	1 µg/µl	E4881

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The small size (19.1kDa) and extreme brightness (about 100-fold brighter than either firefly [*Photinus pyralis*] or *Renilla reniformis*) of NanoLuc® luciferase (Nluc) make it an ideal protein fusion partner. NanoLuc® fusion proteins can be used in a variety of applications including: reporters of protein stability, probes for bioluminescent cell imaging (BLI) or as the donor signal in bioluminescent resonance energy transfer (BRET) applications for protein:protein or protein:small-molecule interaction studies.

The NanoLuc® protein fusion vectors enable simple generation of N or C terminal fusions of NanoLuc® luciferase with your protein of interest and are available in two formats to accommodate your cloning preferences:

- pNLF Vector series: Generate N or C terminal fusions to the full-length Nluc protein or attach secreted Nluc to the N terminus of the protein of interest using traditional cloning with a multiple cloning site (MCS).
- pF Vector series: Generate N or C terminal Nluc fusion proteins using the Flexi® Vector Cloning System—a directional cloning method based on two rare-cutting restriction enzymes, SgfI and PmeI, that provides a rapid, efficient and high-fidelity way to transfer protein-coding regions between a variety of Flexi® Vectors without the need to resequence.

Features:

- **Easily Quantify Changes in Protein Abundance:** Use the single-addition Nano-Glo® Luciferase Assay System to quantify the signal from NanoLuc® fusion proteins to measure intracellular protein levels.
- **Obtain Improved Biological Relevance:** Bright NanoLuc® reporter enables endogenous expression levels of NanoLuc® fusion proteins to avoid overexpression artifacts.
- **Visualize Intracellular Protein Dynamics:** Bright NanoLuc® reporter enables reduced imaging exposure times without the need for repeated sample excitation, which can result in cytotoxic artifacts.
- **Improve BRET Studies:** The brighter signal and blue-shifted emission spectrum from NanoLuc® luciferase result in less spectral overlap with fluorescent acceptors, resulting in better signal:background and dynamic range for BRET applications.
- **Flexible Cloning Options:** Easily attach NanoLuc® luciferase to the N or C terminus of your protein of interest using either traditional or Flexi® cloning systems.
- **Easily Transition from Transient to Stable Cells:** All vectors contain a mammalian selectable marker to create a stable line.

Storage Conditions: Store at –20°C.

NanoLuc® Stability Sensors for Cell Signaling

Product	Size	Conc.	Cat.#
pNLF1-HIF1A [CMV/neo] Vector	1 each	1 µg/µl	N1381
pNLF1-NRF2 [CMV/neo] Vector	1 each	1 µg/µl	N1391

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The rate of protein turnover is tightly regulated for many signaling proteins involved in oncogenesis and response to cellular stress. Protein stabilization and subsequent accumulation occurs in response to changing cellular conditions resulting in activation of downstream transcriptional events. The NanoLuc® Stability Sensors are ready-to-use vector systems that utilize the advantages of the NanoLuc® luciferase reporter to enable stability studies of two key signaling proteins, HIF1A and NRF2, providing a method to directly measure this primary signaling event.

HIF1A Vector System: The HIF1A Vector System enables simple quantification of intracellular HIF1A protein levels to study the dynamics of this signaling protein in mediating cellular response to hypoxia. It contains a vector encoding NanoLuc® fused to the C terminus of the HIF1A protein under control of the CMV promoter plus Transfection Carrier DNA to allow titratable intracellular fusion protein expression.

NRF2 Vector System: The NRF2 Vector System enables simple quantification of intracellular NRF2 protein levels to study the dynamics of this signaling protein in mediating cellular response to oxidative stress. It contains a vector encoding NanoLuc® fused to the C terminus of the NRF2 protein under the control of the CMV promoter, a pKEAP1-expressing vector for proper regulation of intracellular NRF2 levels and Transfection Carrier DNA for titratable intracellular fusion protein expression.

Features:

- **Ready to Use:** Constructs are predesigned, optimized and tested for low endotoxin levels.

Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system

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Available in the Helix® on-site stocking system

Coincidence Reporter Vectors

Product	Size	Cat.#
pNLCol1[*luc2*-P2A-*NlucP*/Hygro] Vector	20 µg	N1461
pNLCol2[*luc2*-P2A-*NlucP*/minP/Hygro] Vector	20 µg	N1471
pNLCol3[*luc2*-P2A-*NlucP*/CMV/Hygro] Vector	20 µg	N1481
pNLCol4[*luc2*-P2A-*NlucP*/PGK/Hygro] Vector	20 µg	N1491

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Luciferase-based reporter-gene assays remain a useful and powerful method of high-throughput compound screening. However, false hits that result from direct interaction of compounds with the luciferase reporter can result in unnecessary follow-up efforts. The pNLCol Vectors comprise a second-generation coincidence reporter vector system that allow expression of both firefly luciferase (*luc2*) and NanoLuc® Luciferase fused to a PEST destabilization domain (NlucP) from the same mRNA transcript. The stoichiometric expression of both luciferases is achieved by use of the P2A sequence from porcine teschovirus-1, which promotes a ribosomal skip and expression of the two unfused enzymes with distinct compound interaction profiles. When used in high-throughput compound screening, false hits caused by direct interaction with one or the other luciferases can be distinguished from true hits that show a similar response for both, reducing workload associated with follow-up screens.

The pNLCol Vectors are designed for use with the Nano-Glo® Dual-Luciferase® Reporter (NanoDLR™) Assay System, which allows sequential detection of firefly and NanoLuc® Luciferase in activity in the same sample. Both reagents provide stable glow-type luminescence signals with half-lives of approximately two hours allowing batch processing of samples and amenable to assays or screens in 96-, 384- or 1,536-well plate formats. Potent inhibition of firefly luciferase coupled with the high-intensity luminescence of NanoLuc® luciferase maximizes sensitivity for detection of both reporters.

Features:

- **Improve Confidence and Save Time:** Use of two different transcriptional reporters reduces false hit rates, increases the identification of true biological hits and eliminates time wasted on false-positive follow-up.
- **Employ Robust and Sensitive Reporter Pair:** *luc2* and NlucP provide a bright reporter combination compatible with low-copy-number and plate scale-up, and provide greater signal-to-background compared to other reporters.
- **Efficiently Identify False Hits:** Firefly and NanoLuc® luciferase have dissimilar profiles of compound interference, enabling the identification of more false-positives than when either reporter is used alone.
- **Use Simple Detection Format:** Convenient "add-read-add-read" homogeneous format of NanoDLR™ assay is ideal for automation and HTS approaches.

Storage Conditions: Store at –20°C.

Promoter-Driven Control Firefly and NanoLuc® Luciferase Vectors

Product	Size	Cat.#
pGL4.53[*luc2*/PGK] Vector	20 µg	E5011
pGL4.54[*luc2*/TK] Vector	20 µg	E5061
pGL4.50[*luc2*/CMV/Hygro] Vector	20 µg	E1310
pGL4.51[*luc2*/CMV/Neo] Vector	20 µg	E1320
pGL4.13[*luc2*/SV40] Vector	20 µg	E6681
pNL1.1.PGK[*Nluc*/PGK] Vector	20 µg	N1441
pNL1.1.TK[*Nluc*/TK] Vector	20 µg	N1501
pNL1.1.CMV[*Nluc*/CMV] Vector	20 µg	N1091
Available Separately		
Nano-Glo® Dual-Luciferase® Reporter Assay/pNL1.1.TK Bundle	1 each	N1521
Nano-Glo® Dual-Luciferase® Reporter Assay/pNL1.1.PGK Bundle	1 each	N1531
Nano-Glo® Dual-Luciferase® Reporter Assay/pGL4.54[*luc2*/TK] Bundle	1 each	N1541
Nano-Glo® Dual-Luciferase® Reporter Assay/pGL4.53[*luc2*/PGK] Bundle	1 each	N1551
NanoDLR/pNL1.1.TK Helix® Bundle	1 each	N1561

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Description: The promoter-driven firefly (Fluc) and NanoLuc® (Nluc) control vectors can be used to co-transfect with experimental luciferase vectors when using the Nano-Glo® Dual-Luciferase® Reporter (NanoDLR™) Assay System. NanoLuc® luciferase is a small (19.1kDa), stable reporter enzyme that can be up to 100-fold more sensitive than the flash-type *Renilla* signal in the DLR™ Assay and more than 3,000-fold more sensitive than the *Renilla* signal in the Dual-Glo® Assay. The increased brightness of the NanoLuc® Luciferase allows you to use less control DNA, minimizing assay artifacts and providing a stable control signal for normalization of the experimental Fluc reporter. Firefly luciferase, which is derived from *Photinus pyralis*, can be used be used as the control when NanoLuc® Luciferase is the experimental reporter. The *luc2* gene that encodes Fluc is optimized for mammalian expression. The vectors are engineered with minimal consensus transcription factor-binding sites to reduce anomalous expression.

Learn more information about the Nano-Glo® Dual-Luciferase® Reporter (NanoDLR™) Assay System.

Features:

- **Experience Assay Design Flexibility:** The NanoDLR™ Assay is compatible with multiple experimental configurations. Use either Fluc or Nluc as the experimental reporter and normalize with either the Nluc or Fluc control, respectively.
- **Minimize Assay Artifacts:** Increased brightness of Fluc and Nluc reporters requires less control DNA to be transfected.
- **Achieve Appropriate Expression Level:** Multiple promoter options are available to obtain appropriate levels of the control reporter in your experimental system.
- **Transition Easily:** The NanoDLR™ Assay uses the same protocol as the popular Dual-Glo® Luciferase Assay, with improved sensitivity, performance and convenience. Control vectors are ready to substitute into your assay.

Storage Conditions: Store at –20°C.

Promoter-Driven Control Firefly and *Renilla* Luciferase Vectors

Product	Size	Cat.#
pGL4.50[*luc2*/CMV/Hygro] Vector	20 µg	E1310
pGL4.51[*luc2*/CMV/Neo] Vector	20 µg	E1320
pGL4.13[*luc2*/SV40] Vector	20 µg	E6681
pGL4.53[*luc2*/PGK] Vector	20 µg	E5011
pGL4.54[*luc2*/TK] Vector	20 µg	E5061
pGL4.73[*hRluc*/SV40] Vector	20 µg	E6911
pGL4.74[*hRluc*/TK] Vector	20 µg	E6921
pGL4.75[*hRluc*/CMV] Vector	20 µg	E6931

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Description: The Promoter-driven *Renilla* control vectors are commonly co-transfected with experimental firefly luciferase vectors for use in the Dual-Luciferase® or Dual-Glo® Reporter Assay Systems. The control *Renilla* vectors should give an almost invariant level of activity, while the experimental firefly vector varies with treatment. The promoter-driven pGL4.13 firefly vector can be used in situations where the experimental vector is designed in a *Renilla* vector. The pGL4.50 and pGL4.51 are useful for tagging a cell line and offer a selectable marker for creating stable transfectants. The pGL4.50 and pGL4.51 vectors are ideal for tagging cell lines for use in in vivo bioluminescent imaging applications.

Features:

Improved Sensitivity and Biological Relevance Due to:

- **Increased Reporter Gene Expression:** Codon optimization of synthetic genes for mammalian expression.
- **Reduced Background and Risk of Expression Artifacts:** Removal of cryptic DNA regulatory elements and transcription factor binding sites.
- **Improved Temporal Response:** Rapid Response™ technology available using destabilized luciferase genes.

Additional Advantages Include:

- **Flexible Detection Options:** Choice of either synthetic *luc2* (*Photinus pyralis*) or *hRluc* (*Renilla reniformis*) reporter genes.
- **Easy Transition from Transient to Stable Cells:** Choice of mammalian selectable markers.
- **Easy Transfer from Vector to Vector:** Common multiple cloning site and a unique SfiI transfer scheme.

Storage Conditions: Store at –20°C.

Promoterless Firefly Luciferase Vectors

Product	Size	Cat.#
pGL4.10[*luc2*] Vector	20 µg	E6651
pGL4.11[*luc2P*] Vector	20 µg	E6661
pGL4.12[*luc2CP*] Vector	20 µg	E6671
pGL4.14[*luc2*/Hygro] Vector	20 µg	E6691
pGL4.15[*luc2P*/Hygro] Vector	20 µg	E6701
pGL4.16[*luc2CP*/Hygro] Vector	20 µg	E6711
pGL4.17[*luc2*/Neo] Vector	20 µg	E6721
pGL4.18[*luc2P*/Neo] Vector	20 µg	E6731
pGL4.19[*luc2CP*/Neo] Vector	20 µg	E6741
pGL4.20[*luc2*/Puro] Vector	20 µg	E6751
pGL4.21[*luc2P*/Puro] Vector	20 µg	E6761
pGL4.22[*luc2CP*/Puro] Vector	20 µg	E6771

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Promoterless firefly luciferase vectors are designed primarily to accept a putative promoter element for investigation of important regions controlling gene transcription. The promoterless vectors are available with three varieties of engineered firefly luciferase genes: *luc2*, *luc2P* or *luc2CP*. The *luc2* gene is engineered to remove most cryptic transcription factor binding sites and improve mammalian expression through codon optimization. The *luc2P* and *luc2CP* and RapidResponse™ genes are *luc2* genes appended with degradation sequences to influence the cellular half-life of the *luc2* gene. The RapidResponse™ genes respond more rapidly to stimuli but at the expense of signal intensity. The *luc2P* (1-hour half-life) gene responds more rapidly than *luc2* (3-hour half-life) with moderate signal intensity, and the *luc2CP* (0.4-hour half-life) responds more quickly with the lowest signal intensity. The promoterless vectors are available with or without selectable markers (hygromycin, neomycin or puromycin).

Features:

Improved Sensitivity and Biological Relevance Due to:

- **Increased Reporter Gene Expression:** Codon optimization of synthetic genes for mammalian expression.
- **Reduced Background and Risk of Expression Artifacts:** Removal of cryptic DNA regulatory elements and transcription factor binding sites.
- **Improved Temporal Response:** Rapid Response™ technology available using destabilized luciferase genes.

Additional Advantages Include:

- **Flexible Detection Options:** Choice of either synthetic *luc2* (*Photinus pyralis*) or *hRluc* (*Renilla reniformis*) reporter genes.
- **Easy Transition from Transient to Stable Cells:** Choice of mammalian selectable markers.
- **Easy Transfer from Vector to Vector:** Common multiple cloning site and a unique SfiI transfer scheme.

Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system

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Promoterless *Renilla* Luciferase Vectors

Product	Size	Cat.#
pGL4.70[*hRluc*] Vector	20 µg	E6881
pGL4.71[*hRlucP*] Vector	20 µg	E6891
pGL4.72[*hRlucCP*] Vector	20 µg	E6901
pGL4.76[*hRluc*/Hygro] Vector	20 µg	E6941
pGL4.77[*hRlucP*/Hygro] Vector	20 µg	E6951
pGL4.78[*hRlucCP*/Hygro] Vector	20 µg	E6961
pGL4.79[*hRluc*/Neo] Vector	20 µg	E6971
pGL4.80[*hRlucP*/Neo] Vector	20 µg	E6981
pGL4.81[*hRlucCP*/Neo] Vector	20 µg	E6991
pGL4.82[*hRluc*/Puro] Vector	20 µg	E7501
pGL4.83[*hRlucP*/Puro] Vector	20 µg	E7511
pGL4.84[*hRlucCP*/Puro] Vector	20 µg	E7521
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Promoterless *Renilla* luciferase vectors are designed primarily to accept a putative promoter element for investigation of important regions controlling gene transcription. Alternatively, they may be used as promoterless control vectors in a dual-reporter system with a firefly luciferase vector serving as the experimental vector. The promoterless vectors are available with three varieties of engineered *Renilla* luciferase genes: *hRluc*, *hRlucP* or *hRlucCP*. The *hRluc* gene is engineered to remove most cryptic transcription factor binding sites and improve mammalian expression through codon optimization. The *hRlucP* and *hRlucCP* and RapidResponse™ genes are *hRluc* genes appended with degradation sequences to influence the cellular half-life of the *hRluc* gene. The RapidResponse™ genes respond more rapidly to stimuli but at the expense of signal intensity. The *hRlucP* gene responds more rapidly than *hRluc2* with moderate signal intensity, and the *hRlucCP* responds more quickly with the lowest signal intensity. The promoterless vectors are available with or without selectable markers (hygromycin, neomycin or puromycin).

Features:

Improved Sensitivity and Biological Relevance Due to:

- **Increased Reporter Gene Expression:** Codon optimization of synthetic genes for mammalian expression.
- **Reduced Background and Risk of Expression Artifacts:** Removal of cryptic DNA regulatory elements and transcription factor binding sites.
- **Improved Temporal Response:** Rapid Response™ technology available using destabilized luciferase genes.

Additional Advantages Include:

- **Flexible Detection Options:** Choice of either synthetic *luc2* (*Photinus pyralis*) or *hRluc* (*Renilla reniformis*) reporter genes.
- **Easy Transition from Transient to Stable Cells:** Choice of mammalian selectable markers.
- **Easy Transfer from Vector to Vector:** Common multiple cloning site and a unique SfiI transfer scheme.

Storage Conditions: Store at –20°C.

Signaling Pathway Analysis (Minimal Promoter-Driven) Firefly Luciferase Vectors

Product	Size	Cat.#
pGL4.37[*luc2P*/ARE/Hygro] Vector	20 µg	E3641
pGL4.38[*luc2P*/p53 RE/Hygro] Vector	20 µg	E3651
pGL4.39[*luc2P*/ATF6 RE/Hygro] Vector	20 µg	E3661
pGL4.40[*luc2P*/MRE/Hygro] Vector	20 µg	E4131
pGL4.41[*luc2P*/HSE/Hygro] Vector	20 µg	E3751
pGL4.42[*luc2P*/HRE/Hygro] Vector	20 µg	E4001
pGL4.43[*luc2P*/XRE/Hygro] Vector	20 µg	E4121
pGL4.44[*luc2P*/AP1 RE/Hygro] Vector	20 µg	E4111
pGL4.45[*luc2P*/ISRE/Hygro] Vector	20 µg	E4141
pGL4.47[*luc2P*/SIE/Hygro] Vector	20 µg	E4041
pGL4.48[*luc2P*/SBE/Hygro] Vector	20 µg	E3671
pGL4.49[*luc2P*/TCF-LEF RE/Hygro] Vector	20 µg	E4611
pGL4.52[*luc2P*/STAT5RE/Hygro] Vector	20 µg	E4651
pGL4.29[*luc2P*/CRE/Hygro] Vector	20 µg	E8471
pGL4.30[*luc2P*/NFAT-RE/Hygro] Vector	20 µg	E8481
pGL4.32[*luc2P*/NF-κB-RE/Hygro] Vector	20 µg	E8491
pGL4.33[*luc2P*/SRE/Hygro] Vector	20 µg	E1340
pGL4.34[*luc2P*/SRF-RE/Hygro] Vector	20 µg	E1350
Available Separately		
pGL4.23[*luc2*/minP] Vector	20 µg	E8411
pGL4.24[*luc2P*/minP] Vector	20 µg	E8421
GloResponse™ NFAT-RE-*luc2P* HEK293 Cell Line	2 vials	E8510
GloResponse™ NF-κB-RE-*luc2P* HEK293 Cell Line	2 vials	E8520
pGL4.25[*luc2CP*/minP] Vector	20 µg	E8431
pGL4.26[*luc2*/minP/Hygro] Vector	20 µg	E8441
pGL4.27[*luc2P*/minP/Hygro] Vector	20 µg	E8451
pGL4.28[*luc2CP*/minP/Hygro] Vector	20 µg	E8461
GloResponse™ CRE-*luc2P* HEK293 Cell Line	2 vials	E8500
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Description: Creating a cell line with an indicator of a functional signaling pathway is useful for deciphering the components in a signaling pathway. These tools are made by insertion of multiple repeats of a response element upstream of a minimal promoter (minP). Promega has designed vectors that report the activity of a variety of pathways using the optimized *luc2* firefly luciferase gene in the pGL4 backbone. These vectors also have a hygromycin resistance selectable marker, allowing use either in transient transfection experiments or for selection of a stable cell line.

Available vectors and the pathways each can measure:

Also available for construction of pathway reporters are minimal promoter (minP) vectors with three varieties of engineered firefly luciferase genes: *luc2, luc2P* or *luc2CP*. The *luc2* gene is engineered to remove most cryptic transcription factor binding sites and improve mammalian expression through codon optimization. The *luc2P* and *luc2CP* and RapidResponse™ genes are *luc2* genes appended with degradation sequences to influence the cellular half-life of the *luc2* gene. The RapidResponse™ genes respond more rapidly to stimuli but at the expense of signal intensity. The *luc2P* (1-hour half-life) gene responds more rapidly than *luc2* (3-hour half-life) with moderate signal intensity, and the *luc2CP* (0.4-hour half-life) responds more quickly with the lowest signal intensity. The minP vectors are available with or without selectable markers (hygromycin). To speed research, several pre-designed response element vectors based on the pGL4.27 Vector are available. Some of these also are available stable cell lines (GloResponse™ Cell Lines).

Features:

- **Pre-designed vectors** remove the need to clone and validate an assay.
- **Increased Reporter Gene Expression:** Codon optimization of synthetic genes for mammalian expression.
- **Reduced Background and Risk of Expression Artifacts:** Removal of cryptic DNA regulatory elements and transcription factor binding sites.
- **Improved Temporal Response:** Rapid Response™ technology using destabilized luciferase genes.
- **Easy Transition from Transient to Stable Cells:** Choice of mammalian selectable markers.

Storage Conditions: Store at –20°C.

Nuclear Receptor Analysis Luciferase Vectors

Product	Size	Cat.#
pGL4.36[*luc2P*/MMTV/Hygro] Vector	20 µg	E1360
pFN26A (BIND) *hRluc*-neo Flexi® Vector	20 µg	E1380
pBIND-ERα Vector	20 µg	E1390
pBIND-GR Vector	20 µg	E1581
pGL4.35[*luc2P*/9X*GAL4*UAS/Hygro] Vector	20 µg	E1370

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Description: Nuclear receptor analysis can be performed with traditional means, using a minimal promoter vector with nuclear receptor response elements upstream. Alternatively, you can use viral elements like the mouse mammary tumor virus long terminal repeat promoter to judge androgen or glucocorticoid responses (e.g., pGL4.36). In many cases, use of these methods requires a cell line with the appropriate endogenous nuclear receptors, meaning you may need different cell lines for each nuclear receptor study. A method using the principles of the yeast two-hybrid system was adapted for nuclear receptor work. The nuclear receptor ligand binding domain is fused to the GAL4 DNA binding domain and transfected with a firefly luciferase vector containing repeats of the GAL4 upstream activation sequence upstream of a minimal promoter. The ligand binding domain is responsible for ligand binding, homo- or heterodimerization and interactions with co-activator or co-repressors. The one-hybrid method allows you work with any cell line and nuclear receptor you desire.

Features:

- **Robust:** GAL4-based system removes background signals from endogenous receptors.
- **More Sensitive:** Optimized 9X Gal4 gives improved responses, better signal:noise ratio.
- **Adaptable:** Combination *Renilla*/Neomycin marker allows normalization with Dual-Luciferase® Assay or selectable markers for generating stable cell lines, all with one vector.
- **Consistent:** Compare or profile all nuclear receptors with a single experimental system.
- **Faster Results:** Destabilized and optimized *luc2P* luciferase gene allows greater sensitivity and shorter induction times.

Storage Conditions: Store at –20°C.

pmirGLO Dual-Luciferase miRNA Target Expression Vector

Product	Size	Cat.#
pmirGLO Dual-Luciferase miRNA Target Expression Vector	20 µg	E1330

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The pmirGLO Vector is designed to quantitatively evaluate microRNA (miRNA) activity by the insertion of miRNA target sites downstream or 3′ of the firefly luciferase gene (*luc2*). Firefly luciferase is the primary reporter gene; reduced firefly luciferase expression indicates the binding of endogenous or introduced miRNAs to the cloned miRNA target sequence. This vector is based on Promega dual-luciferase technology, with *luc2* used as the primary reporter to monitor mRNA regulation and *Renilla* luciferase (*hRluc-neo*) acting as a control reporter for normalization and selection.

Features:

- **Measure miRNA Function:** Reporter activity correlates with miRNA activity.
- **Optimized Reporter Genes:** *luc2* gene provides highest expression.
- **Combination *Renilla*/Neomycin Marker:** Normalize with Dual-Luciferase® Assay or for stable cell lines, all with one vector.
- **Biologically Relevant Results:** The moderate-strength PGK promoter provides sensitive analysis not possible with strong promoters.

Storage Conditions: Store at –20°C.

pRL *Renilla* Luciferase Control Reporter Vectors

Product	Size	Cat.#
pRL-SV40 Vector	20 µg	E2231
pRL-TK Vector	20 µg	E2241
pRL-CMV Vector	20 µg	E2261
pRL-null Vector	20 µg	E2271

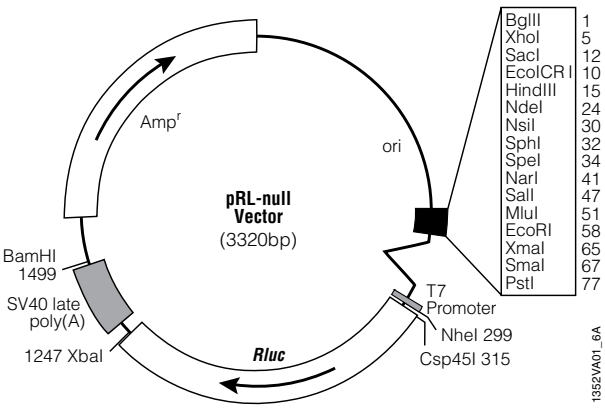
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The pRL Vectors are wildtype *Renilla* luciferase (*Rluc*) control reporter vectors. The pRL Vectors, which provide constitutive expression of *Renilla* luciferase, can be used in combination with a firefly luciferase vector to cotransfect mammalian cells. Expression of *Renilla* luciferase provides an internal control value to which expression of the experimental firefly luciferase reporter gene may be normalized. The pRL Vectors contain the cDNA encoding *Renilla* luciferase (*Rluc*) cloned from the anthozoan coelenterate *Renilla reniformis* (sea pansy). Four different promoter configurations are available. The HSV-thymidine kinase promoter (pRL-TK) is relatively weak and may be particularly useful in providing neutral constitutive expression of the *Renilla* luciferase control reporter. The early SV40 enhancer/promoter region (pRL-SV40) and the CMV immediate early enhancer/promoter region (pRL-CMV) typically provide high-level transcription and, therefore, may be less suitable for co-reporter applications involving experimental vectors with robust regulatory elements. In general, we recommend validating the performance of specific co-reporter combinations in the desired target cells. In addition to the modified *Rluc* reporter gene, all pRL Vectors are isolated from a *dam*–/*dcm*– *E. coli* K host strain, allowing digestion with restriction enzymes that are sensitive to *dam* and *dcm* methylation.

Features:

- A T7 promoter is located immediately upstream of *Rluc*, allowing in vitro synthesis of *Renilla* luciferase.
- The SV40 late poly(A) signal sequence is positioned downstream of *Rluc* to provide efficient transcription termination and mRNA polyadenylation.
- A prokaryotic origin of replication and β-lactamase gene allow selected propagation of the pRL vectors in *E. coli* host strains.
- To avoid DNA methylation, all pRL Vectors are isolated from a *dam*–/*dcm*– *E. coli* K host strain.

Storage Conditions: Store vectors at –20°C.



pGL3 Luciferase Reporter Vectors

Product	Size	Cat.#
pGL3-Basic Vector	20 µg	E1751
pGL3-Control Vector	20 µg	E1741
pGL3-Enhancer Vector	20 µg	E1771
pGL3-Promoter Vector	20 µg	E1761

For Research Use Only. Not for Use in Diagnostic Procedures.

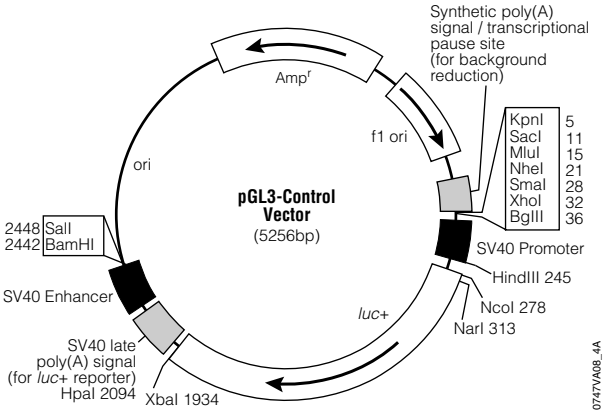
Description: The pGL3 Luciferase Reporter Vectors provide a basis for the quantitative analysis of factors that potentially regulate mammalian gene expression. These may be *cis*- or *trans*-acting factors. The backbone of the pGL2 Luciferase Reporter Vectors was redesigned for the pGL3 Vectors for increased expression, with a modified coding region for firefly (*Photinus pyralis*) luciferase that has been optimized for monitoring transcriptional activity in transfected eukaryotic cells. The assay of this genetic reporter is rapid, sensitive and quantitative. In addition, the Luciferase Reporter Vectors contain numerous features aiding in the structural characterization of the putative regulatory sequences under investigation.

For the most advanced reporter vectors and widest selection of features, please see the pGL4 Luciferase Reporter Vectors.

Features:

- **Easy to Use:** NcoI site located at 5′ end of *luc*+ gene allows creation of fusions with reporter gene using a unique NcoI site.
- **Flexible:** Placement of SmaI site in the MCS allows blunt-ended inserts to be ligated into the MCS and restricted on either side by other restriction endonucleases.
- **Versatile:** XbaI site just downstream of *luc*+ gene facilitates insertions into the 3′ untranslated region of mRNA or subcloning of the luciferase gene.

Storage Conditions: Store vectors at –20°C.



pGL2 Luciferase Reporter Vectors

Product	Size	Cat.#
pGL2-Basic Vector	20 µg	E1641
pGL2-Control Vector	20 µg	E1611
pGL2-Enhancer Vector	20 µg	E1621
pGL2-Promoter Vector	20 µg	E1631

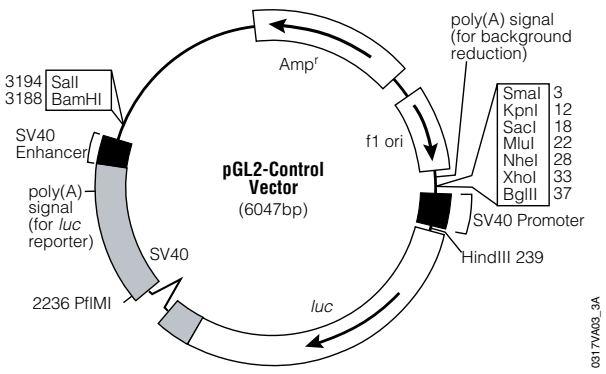
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The pGL2 Luciferase Reporter Vectors provide a basis for the quantitative analysis of factors that potentially regulate mammalian gene expression. These factors may be *cis*-acting, such as promoters and enhancers, or *trans*-acting, such as various DNA-binding factors. The pGL2 Vectors carry the coding region for firefly (*Photinus pyralis*) luciferase, which is used to monitor transcriptional activity in transfected eukaryotic cells. The assay of this genetic reporter is rapid, sensitive and quantitative. In addition, the pGL2 Vectors contain numerous features that aid in the characterization and mutagenesis of the putative regulatory sequences.

Features:

- **Versatile:** Deletions and site-directed mutations can be made directly to inserted DNAs without subcloning.
- **Convenient:** All vectors contain the firefly luciferase reporter gene, which enables sensitive and rapid quantitation of reporter activity.
- **Low Background:** Upstream polyadenylation signal minimizes spurious transcription of the reporter gene.

Storage Conditions: Store vector at –20°C. Store bacterial strain at –70°C.



Available in the Helix® on-site stocking system

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pGEM®-*luc* DNA

Product	Size	Cat.#
pGEM®-*luc* DNA	20 µg	E1541

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The pGEM®-*luc* Vector is a cassette vector designed to be a source of the *luc* gene encoding firefly luciferase, which is found in the pGL2 Vectors. The plasmid is not intended for the expression of luciferase in eukaryotic or prokaryotic cells.

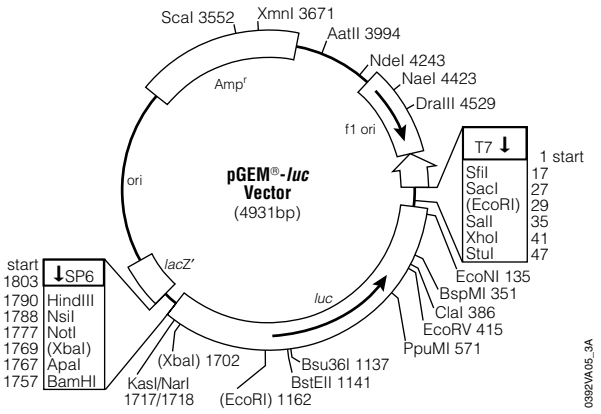
The pGEM®-*luc* Vector was constructed by positioning the luciferase gene (*luc*) in the center of the multiple cloning region of the pGEM®-11Zf(–) Vector, providing a number of unique restriction sites at both ends of the gene. Sites that are surrounded by parentheses are not unique, as additional sites for each also exist in the luciferase gene. Note also that using HindIII or NsiI to clone the luciferase gene will include upstream ATG codons, which may reduce the efficiency of expression in eukaryotes. The luciferase cassette does not contain the prokaryotic Shine-Delgarno sequence for bacterial expression.

The pGEM®-*luc* Vector is supplied with a glycerol stock of bacterial strain JM109.

Features:

- **Flexibility:** Provides a luciferase cassette with several unique cloning sites at both ends for analysis of transcriptional activity, mRNA processing, protein structure/function, or labeling of cells and viruses.

Storage Conditions: Store vector at –20°C. Store bacterial strain at –70°C.



GloResponse™ Luciferase Reporter Cell Lines

Product	Size	Cat.#
GloResponse™ CRE-*luc2P* HEK293 Cell Line	2 vials	E8500
GloResponse™ NFAT-RE-*luc2P* HEK293 Cell Line	2 vials	E8510
GloResponse™ NF-κB-RE-*luc2P* HEK293 Cell Line	2 vials	E8520

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Description: The GloResponse™ Luciferase Reporter Cell Lines contain optimized, state-of-the-art luciferase reporter technology integrated into a cell line. This allows the rapid development of a reporter assay based on the pathway of interest regulating the luciferase gene. Assays configured using the GloResponse™ Cell Lines are amenable for high-throughput screening. These assays typically have greater response dynamics (fold of induction) than other assay formats and good quality as indicated by the high Z′ values. GloResponse™ Cell Lines were developed to study a variety of signaling pathways. Activators of these pathways may be native to the HEK293 cell line. Activity of non-native activators can be studied after they have been introduced by transfection.

GPCRs regulate a wide-range of biological functions and are one of the most important target classes for drug discovery. GPCR signaling pathways can be categorized into three classes based on the G protein α-subunit involved: G_s, $G_{i/o}$ and G_q. The GloResponse™ CRE-*luc2P* HEK293 Cell Line can be used to study and configure screening assays for G_s- and $G_{i/o}$-coupled GPCRs, which signal through cAMP and the cAMP Response Element (CRE). For G_q-coupled GPCRs, which signal through calcium ion release and activate the Nuclear Factor of Activated T-Cells response element (NFAT-RE), the GloResponse™ NFAT-RE-*luc2P* HEK293 Cell Line should be used.

NF-κB-REs are the DNA binding sequences for the NF-κB transcription factor complex, which is responsible for regulating inflammation, immune response, cell growth and apoptosis. The GloResponse™ NF-κB-RE-*luc2P* HEK293 Cell Line is designed for rapid and convenient analysis of any cellular response that results in modulation of NF-κB activities.

The GloResponse™ Cell Lines were generated by clonal selection of HEK293 cells stably transfected with pGL4-based vectors carrying specific response elements for the pathway of interest. These cell lines incorporate the improvements developed for the pGL4 family of reporter vectors for enhanced performance. The destabilized *luc2P* luciferase reporter is used for improved responsiveness to transcriptional dynamics. The *luc2P* gene is codon optimized for enhanced expression in mammalian cells, and the pGL4 plasmid backbone was engineered to reduce background reporter expression. The result is a cell line with very high induction levels when the pathway of interest is activated.

Features:

- **Convenient:** Prebuilt, optimized luciferase reporter cell lines.
- **Robust:** Large assay window provided by high levels of induction and low background expression.
- **Faster Results:** Improved responsiveness to transcriptional dynamics with destabilized luciferase.

Storage Conditions: Place frozen cells in storage at less than or equal to –140°C (mechanical deep freeze or vapor phase liquid nitrogen) until you are ready to thaw and propagate them. We strongly recommend that the cells are propagated, using the provided procedure, as soon as possible. This will ensure the optimal cell viability and assay performance.

Reporter Vector Sequencing Primers

Product	Size	Cat.#
RVprimer3 (clockwise)	2 µg	E4481
RVprimer4 (counterclockwise)	2 µg	E4491

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Reporter Vector (RV) Sequencing Primers are designed for use with the pGL3 and pGL4 Luciferase Vectors. RVprimer3 binds upstream of the *luc+*, *luc2* or CAT gene, and sequencing runs clockwise across the multiple cloning region.

RVprimer4 binds downstream of the *luc+*, *luc2* or CAT polyadenylation region in the Promoter and Basic Vectors and downstream of the SV40 enhancer region of the Enhancer and Control Vectors. Both primers can be used for sequencing double-stranded templates, but only RVprimer4 can be used for sequencing single-stranded templates.

Primer Sequences

- RVprimer3: 5′-d(CTAGCAAAATAGGCTGTCCC)-3′
- RVprimer4: 5′-d(GACGATAGTCATGCCCCGCG)-3′

Storage Conditions: Store at –20°C. The primers are supplied dried.

pSP-*luc*+NF Fusion Vector

Product	Size	Cat.#
pSP-*luc*+NF Fusion Vector	20 µg	E4471

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The pSP-*luc*+NF Fusion Vector is a luciferase cassette vector containing the engineered firefly luciferase gene, *luc*+NF. The *luc*+NF gene is related to the *luc*+ gene found in the pGL3 family of eukaryotic reporter vectors but has been further modified for maximum flexibility in constructing N-terminal fusions (NF) with luciferase. Subcloning *luc*+NF into expression vectors provides a useful genetic reporter with exceptional sensitivity. The pSP-*luc*+NF Fusion Vector is not itself intended for the expression of luciferase in eukaryotic cells, because it does not contain eukaryotic promoters, enhancers or polyadenylation signals.

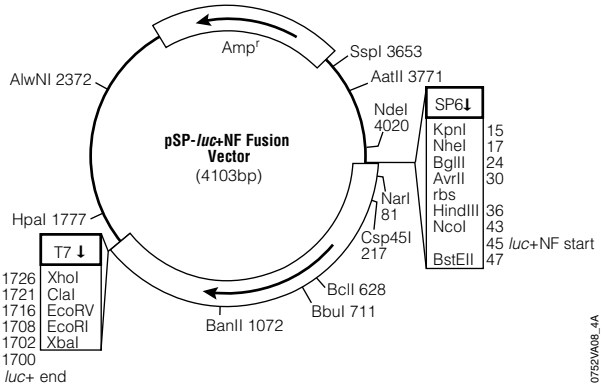
A unique BstEII site has been inserted immediately downstream of the luciferase ATG translation codon, allowing cloned inserts to be positioned immediately downstream of the *luc*+NF initiation codon. This vector is recommended specifically for applications where N-terminal fusion proteins do not contain an internal ATG codon at the luciferase junction.

The *luc*+NF gene is positioned downstream of an SP6 promoter and a ribosome binding site. An opposing T7 promoter is located immediately downstream of *luc*+NF. Thus, the pSP-*luc*+NF Fusion Vector provides a convenient template for the in vitro synthesis of both sense and antisense luciferase transcripts for studies involving in situ hybridization, RNA processing, RNA transfection or coupled in vitro transcription/translation and protein folding. Multiple cloning regions containing recognition sequences for commonly used restriction enzymes are positioned at the 5′ and 3′ ends of *luc*+NF to provide maximum flexibility in cloning. Luciferase enzymatic activity can be assayed most efficiently using one of the Luciferase Assay Systems.

Features:

- **Flexibility:** Multiple cloning regions are positioned at the 5′ and 3′ ends of *luc* to provide maximum flexibility in cloning.
- **N-Terminal Fusions with Luciferase:** Unique BstEII site located immediately downstream of the luciferase ATG translation codon.

Storage Conditions: Store at –20°C.



Available in the Helix® on-site stocking system

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pSV-β-Galactosidase Control Vector

Product	Size	Cat.#
pSV-β-Galactosidase Control Vector	20 µg	E1081

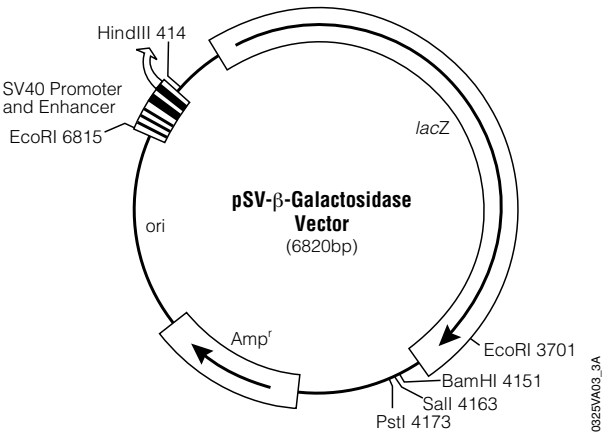
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The pSV-β-Galactosidase Control Vector is a positive control vector for monitoring transfection efficiencies of mammalian cells. The SV40 early promoter and enhancer drive transcription of the *lacZ* gene, which encodes the β-galactosidase enzyme. The pSV-β-Galactosidase Control Vector can be transfected individually or co-transfected with your DNA of interest. β-galactosidase is an excellent reporter enzyme that can be assayed quickly and directly in cell extracts using spectrophotometric, fluorescent or chemiluminescent assays. This reporter enzyme is also widely used for in situ histochemical analysis using the substrate X-Gal.

The pSV-β-Galactosidase Control Vector can be co-transfected with your DNA of interest. For example, co-transfection with firefly luciferase gene vectors (pGL3 Vectors) provide cell extracts that can be assayed for both luciferase and β-galactosidase activities. In this manner, the pSV-β-Galactosidase Vector acts as an internal control for transient expression assays. A negative control extract, prepared from mock-transfected cells, should also be assayed for the presence of endogenous β-galactosidase activity in cultured cells. In addition, co-transfection with chloramphenicol acetyltransferase reporter gene vectors permits assaying for both CAT and β-galactosidase activities.

The pSV-β-Galactosidase Vector is a modification of pRSV-β-Gal with SV40 and pUC18 sequences substituted for RSV and pBR322 sequences. The pSV-β-Galactosidase Vector will express β-galactosidase in *E. coli* due to the presence of the *E. coli* gpt promoter located upstream of the *lacZ* gene. Colonies of *E. coli* containing the pSV-β-Galactosidase Vector will appear blue when plated on media containing X-Gal.

Storage Conditions: Store at –20°C.



Monster Green® Fluorescent Protein phMGFP Vector

Product	Size	Cat.#
Monster Green® Fluorescent Protein phMGFP Vector	20 µg	E6421

For Research Use Only. Not for Use in Diagnostic Procedures.

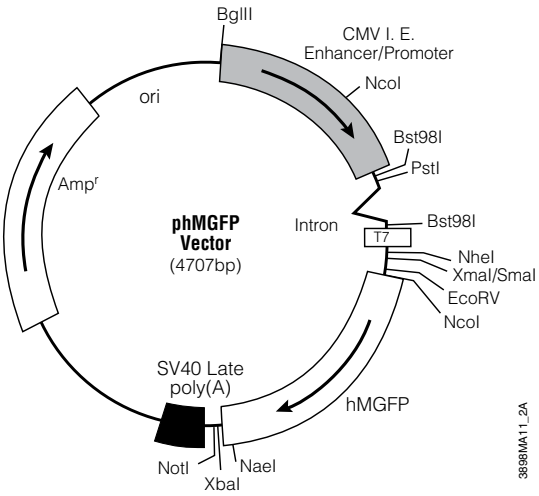
Description: The phMGFP Vector contains the open reading frame for the Monster Green® Fluorescent Protein cloned into a mammalian expression vector. The Monster Green® Fluorescent Protein is encoded by an improved synthetic version of the green fluorescent protein gene originally cloned from *Montastraea cavernosa* (Great Star Coral). The synthetic gene (hMGFP) expresses a 26kDa protein that shows improved fluorescence intensity compared to the native gene. Furthermore, the hMGFP gene has been codon optimized and cleared of most consensus sequence transcription factor binding sites to ensure reliability and high levels of expression.

The Monster Green® Fluorescent Protein encoded by the hMGFP gene is an ideal fluorescent reporter, providing high-level fluorescence and reducing cytotoxicity. Monster Green® Fluorescent Protein generally fluoresces at least 20% brighter than other commercially available green fluorescent proteins (GFPs) and also reduces cytotoxicity, offering flexibility when working with transient and stable expression assays.

Features:

- **Brighter Fluorescence:** Visualize low-level expression in situ using fluorescence microscopy, imagers or FACS®.
- **Reduced Cytotoxicity:** Minimize cellular perturbations when working with transient or stable expression assays.
- **Flexible:** Create fusion proteins for imaging and localization studies using standard FITC detection.
- **High Purity:** Obtain high transfection efficiencies for precloning confirmation studies.

Storage Conditions: Store at –20°C.



Transfection Reagents

ViaFect™ Transfection Reagent

Product	Size	Cat.#
ViaFect™ Transfection Reagent	0.75 ml	E4981
	2 × 0.75 ml	E4982

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: ViaFect™ Transfection Reagent is a novel formulation reagent designed to efficiently introduce DNA into a wide variety of cell lines. ViaFect™ Transfection Reagent has performed in commonly used adherent cell models and also in cells lines traditionally thought of as difficult to transfect such as suspension cells and stem cell-derived lines. This gentle, low-toxicity reagent allows cells to stay healthy and metabolically active during transfection-based experiments and offers an easy-to-use protocol that does not require removal of serum or culture medium prior to use. After introducing the reagent:DNA complex no washing or medium changes are required. ViaFect™ Transfection Reagent provides robust performance with minimal optimization allowing simple design of more relevant assays.

Features:

- **Use the Best Cell Model for Your Study:** ViaFect™ Transfection Reagent is effective in a broad range of cell lines including adherent cell models, suspension cells and stem cell-derived lines.
- **Obtain Superior Transfection Efficiency:** ViaFect™ Transfection Reagent improves the level of transfection in many cell lines.
- **Maintain Healthy Cells:** The low-toxicity reagent maintains cellular biology and metabolism during transfection to more accurately represent the biology being modeled.
- **Simple Assay Design:** An easy-to-use protocol that is robust across transfection conditions requiring minimal optimization.

Storage Conditions: Product may arrive frozen. Upon arrival, thaw at +2°C to +10°C or room temperature and store at +2°C to +10°C.

FuGENE® 6 Transfection Reagent

Product	Size	Cat.#
FuGENE® 6 Transfection Reagent	1 ml	E2691
	5 × 1 ml	E2692
	0.5 ml	E2693

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: FuGENE® 6 Transfection Reagent is a nonliposomal formulation designed to transfect plasmid DNA into a wide variety of cell lines with high efficiency and low toxicity. The protocol does not require removal of serum or culture medium and does not require washing or changing of medium after introducing the reagent/DNA complex.

Features:

- **More Biologically Relevant:** Very low toxicity; less impact on biology.
- **Simple Protocol:** No culture changes; less variability; compatible with serum.
- **Effective in Many Cell Types:** Used in thousands of publications.
- **Ideal for Use with Luciferase Assays:** More expression; sensitive results.

Storage Conditions: Store FuGENE® 6 Transfection Reagent at 4°C.Do not freeze or store below 0°C.

Available in the Helix® on-site stocking system

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FuGENE® HD Transfection Reagent

Product	Size	Cat.#
FuGENE® HD Transfection Reagent	1 ml	E2311
	5 × 1 ml	E2312

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: FuGENE® HD Transfection Reagent is a novel, nonliposomal formulation designed to transfect DNA into a wide variety of cell lines with high efficiency and low toxicity. The protocol does not require removal of serum or culture medium and does not require washing or changing of medium after introducing the reagent/DNA complex. Additionally, the FuGENE® HD Transfection Reagent has been shown to support transfection in chemically defined media and does not contain any animal-derived components.

The cell lines listed in Table 1 have been transfected successfully by Promega Corporation or Fugent, L.L.C. For a list of conditions that were used in the transfection of these and other cell types, visit our FuGENE® HD Protocol Database.

Features:

- **More Biologically Relevant:** Low toxicity, less impact on biology.
- **Simple Protocol:** No culture changes, less variability, compatible with serum.
- **Effective in Many Cell Types:** Online database with over 40 cell types, including primary and stem cells.
- **Ideal for Use with Luciferase Assays:** More expression, sensitive results.

Storage Conditions: Store FuGENE® HD Transfection Reagent at 4°C.Do not freeze or store below 0°C.

TransFast™ Transfection Reagent

Product	Size	Cat.#
TransFast™ Transfection Reagent	1.2 mg	E2431

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The TransFast™ Transfection Reagent is composed of the synthetic cationic lipid, (+)-N,N [bis (2-hydroxyethyl)]-N-methyl-N-[2,3-di(tetradecanoyloxy)propyl] ammonium iodide and the neutral lipid, DOPE. The TransFast™ Reagent is supplied as a dried lipid film that forms multilamellar vesicles upon hydration with water. Cationic liposomes designed for transfection, such as the TransFast™ Reagent, are more versatile than many other traditional transfection methods. The advantages include flexibility in the macromolecules that are delivered, in vitro and in vivo applications, ability to more reproducibly transfect cells that are recalcitrant to other methods and suitability for transient and stable transfection. Several different types of macromolecules, including RNA and DNA in sizes ranging from oligonucleotides to plasmids and yeast artificial chromosomes, can be delivered to cells using liposomes. The TransFast™ Transfection Reagent is designed for nucleic acid delivery to eukaryotic cells in vitro and in vivo and performs well with many cell lines. We have found that TransFast™ Reagent performs particularly well for DNA delivery to NIH/3T3, CHO, 293, K562, PC12, Jurkat and insect Sf9 cells.

Features:

- **Fast:** Transfect in 1 hour. Transfection times can be decreased to as little as 30 minutes with certain cell lines.
- **Easy to Use:** Resuspend the reagent in water, freeze, thaw, mix with DNA, and add to cells.
- **Efficient:** High-efficiency transfection—transient and stable—in many cells.
- **Robust:** Requires less optimization than other systems. Allows transfection of cell types such as primary cell cultures that require continuous exposure to serum.

Storage Conditions: Store at –20°C.

ProFection® Mammalian Transfection System

Product	Size	Cat.#
ProFection® Mammalian Transfection System—Calcium Phosphate	40 reactions	E1200

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The introduction of DNA into mammalian cells is facilitated by the ProFection® Mammalian Transfection System. This system offers you a Calcium Phosphate-mediated transfection procedure. Each system contains sufficient reagents for 40 high-efficiency transfections of cells plated in 100mm tissue culture dishes.

Calcium phosphate transfection is an effective method for the production of long-term stable transfectants. This method also works well for transient expression of transfected genes and can be used with most adherent cell lines.

Features:

- **Efficient:** Components optimized for high transfection efficiencies.

Storage Conditions: Store at –20°C.

Promega

Cloning and DNA Markers

8

Cloning and DNA Markers

Products tagged with the Helix® icon are available for distribution through our convenient on-site stocking program in a freezer, refrigerated unit or an ambient cabinet.

For more information visit: **www.promega.com/helix**

Available in the Helix® on-site stocking system

Molecular Weight Markers

BenchTop DNA Markers

Product	Size	Cat.#
BenchTop ΦX174 DNA/HaeIII Markers	250 µl	G7511
BenchTop pGEM® DNA Markers	250 µl	G7521
BenchTop PCR Markers	300 µl	G7531
BenchTop 1kb DNA Ladder	600 µl	G7541
BenchTop 100bp DNA Ladder	300 µl	G8291

For Laboratory Use.

Description: The BenchTop DNA Markers offer the convenience of storage at room temperature (22–25°C) as well as the capability of direct loading onto agarose gels. The BenchTop DNA Markers are supplied in a stabilizing solution of 1X Blue/Orange Loading Dye, which circumvents any requirements for further manipulation.

BenchTop ΦX174 DNA/HaeIII Markers: Eleven phenol-extracted, ethanol-precipitated DNA fragments ranging in size from 72bp to 1,353bp.

BenchTop pGEM® DNA Markers: Fifteen phenol-extracted, ethanol-precipitated DNA fragments ranging in size from 36bp to 2,645bp. These unique markers are generated from separate digests of pGEM®-3 Vector DNA with HinfI, RsaI and SinI later combined to form the markers.

BenchTop PCR Markers: Six bands of equal intensity of 50, 150, 300, 500, 750, and 1,000bp. The BenchTop PCR Markers may be run on polyacrylamide gels with less loading volume; however, additional bands may be visible compared to those visible on agarose gels.

BenchTop 1kb DNA Ladder: Thirteen blunt-ended fragments with sizes ranging from 250bp to 10,000bp. The 1,000bp and 3,000bp fragments have increased intensity relative to the other bands on ethidium bromide-stained agarose gels for easy identification. All other fragments are of equal intensity. The ladder is dephosphorylated and ready for 5′ end-labeling with radioisotopes using T4 Polynucleotide Kinase, allowing visualization by autoradiography.

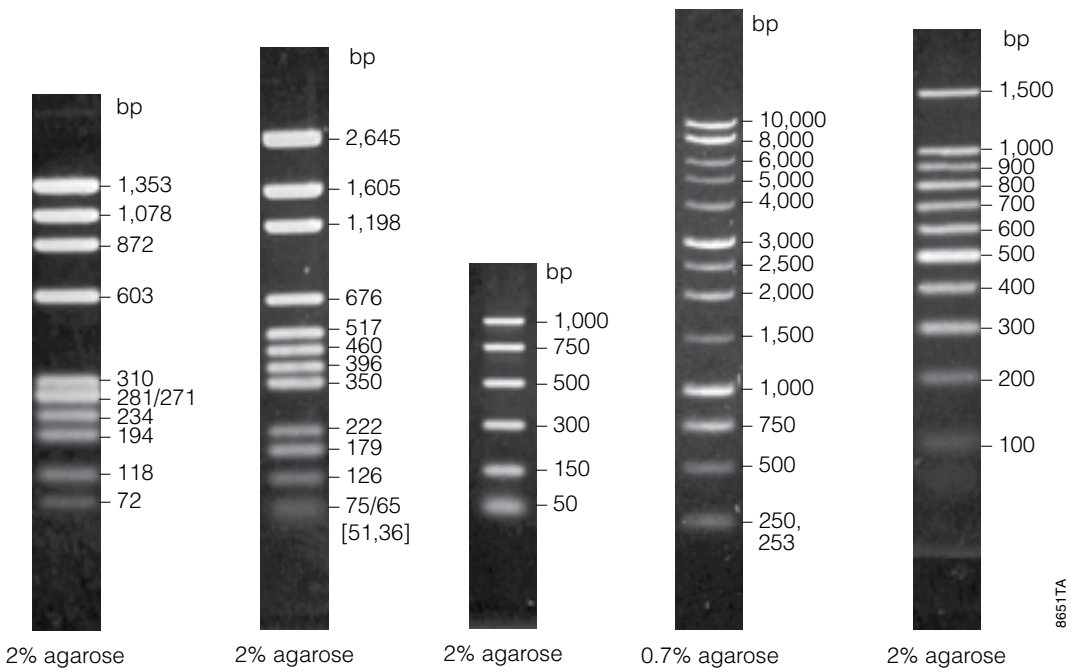
BenchTop 100bp DNA Ladder: Eleven fragments that range in size from 100bp to 1,000bp in 100bp increments with an additional band at 1,500bp. The 500bp fragment is present at increased intensity for easy identification. The ladder is dephosphorylated and ready for 5′ end-labeling with radioisotopes using T4 Polynucleotide Kinase, allowing visualization by autoradiography.

Recommended Loading: Cat.# G7511, G7521: Load 5µl/lane. Cat.# G7531, G7541, G8291: Load 6µl/lane.

Features:

- **Convenient:** Storage at 22–25°C.
- **Efficient:** Premixed with loading buffer. Ready to load onto agarose gels.
- **Versatile:** Five different BenchTop DNA Markers available.

Storage Conditions: Store at 22–25°C.



2% agarose

BenchTop ϕX174 DNA/HaeIII Markers Cat.# G7511 Load 5µl/lane.

2% agarose

BenchTop pGEM® DNA Markers Cat.# G7521 Load 5µl/lane.

2% agarose

BenchTop PCR Markers Cat.# G7531 Load 6µl/lane.

0.7% agarose

BenchTop 1kb DNA Ladder Cat.# G7541 Load 6µl/lane.

2% agarose

BenchTop 100bp DNA Ladder Cat.# G8291 Load 6µl/lane.

DNA Step Ladders

Product	Size	Conc.	Cat.#
10bp DNA Step Ladder	32.5 µg	0.65 µg/µl	G4471
25bp DNA Step Ladder	100 µg	0.36 µg/µl	G4511
50bp DNA Step Ladder	90 µg	0.34 µg/µl	G4521
100bp DNA Step Ladder	100 µg	1 µg/µl	G6951
200bp DNA Step Ladder	100 µg	1 µg/µl	G6961
1kb DNA Step Ladder	90 µg	0.3 µg/µl	G6941

For Laboratory Use.

Description: The DNA Step Ladders are ladders of defined sizes with exact incremental steps between bands. The ladders are not intended for use in quantitative analysis. Each ladder is provided with a tube of 6X Blue/Orange Loading Dye. The fragments may be stained with ethidium bromide.

10bp DNA Step Ladder: Ten blunt-ended DNA fragments ranging from 10bp to 100bp in exactly 10bp increments. All of the bands are of approximately equal intensity with the exception of the 10bp band, which may appear slightly less intense.

25bp DNA Step Ladder: Twelve DNA fragments ranging from 25bp to 300bp in 25bp increments. An 1,800bp "backbone" fragment is also visible. The 300bp band is ≈3 times more intense than all other bands.

50bp DNA Step Ladder: Sixteen DNA fragments ranging from 50bp to 800bp in 50bp increments plus an 1,800bp "backbone" fragment. All bands except the 800bp band are of equal intensity; the 800bp band is ≈3 times more intense.

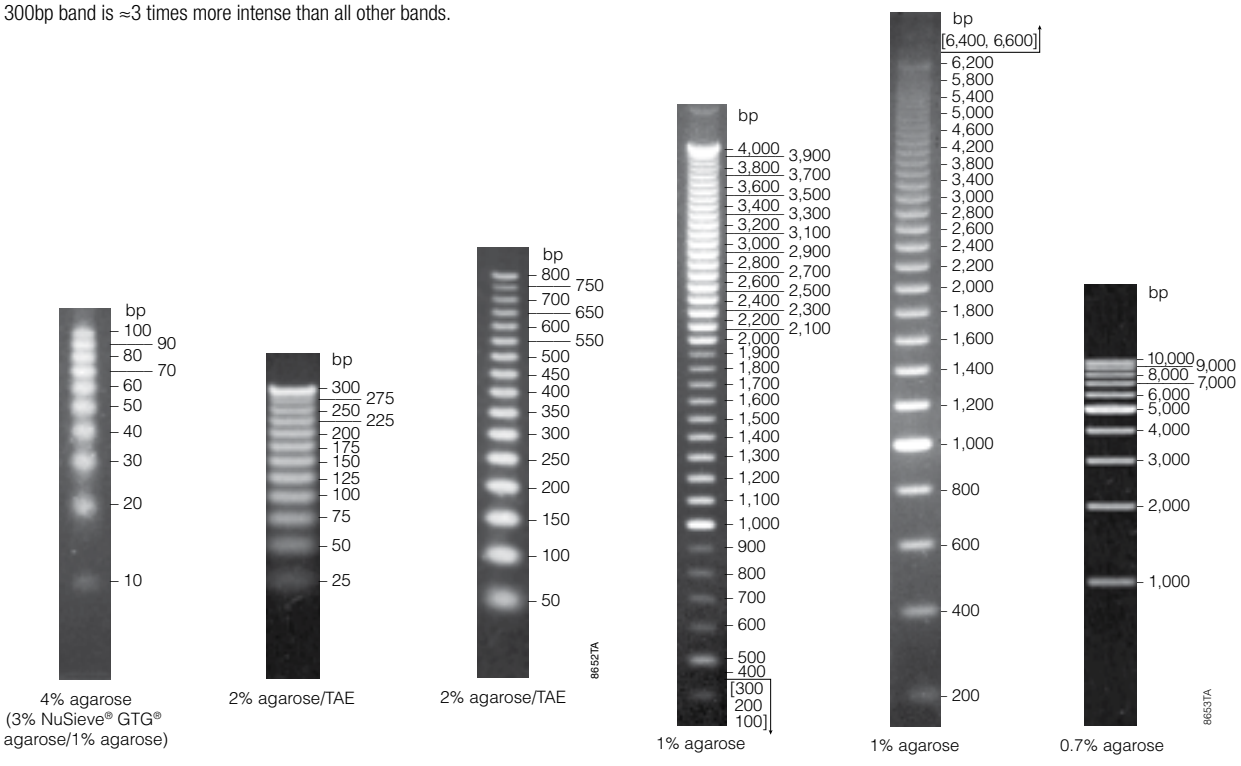
100bp DNA Step Ladder: Forty blunt-ended DNA fragments ranging from 100bp to 4,000bp in 100bp increments. Two internal features facilitate band identification. A high-intensity 500bp band stands out at the lowest segment of the ladder (<1kb). Bands within each segment (<1kb, <2kb, <4kb) have approximately the same intensity.

200bp DNA Step Ladder: Thirty-three blunt-ended DNA fragments ranging from 200bp to 6,600bp in 200bp increments. The 1,000bp band appears more intense than all other bands, which are of approximately equal intensity.

1kb DNA Step Ladder: Ten blunt-ended DNA fragments ranging from 1kb to 10kb in 1kb increments. All bands except the 5kb band are of equal intensity; the 5kb band is ≈3 times more intense.

Recommended Loading: Cat.# G4471, G6951, G6961, G6941: Load 1µl/lane. Cat.# G4511, G4521: Load 5µl/lane.

Storage Conditions: Store at –20°C.



Available in the Helix® on-site stocking system

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DNA Ladders

Product	Size	Conc.	Cat.#
PCR Markers	250 µl	~0.06 µg/µl	G3161
100bp DNA Ladder	250 µl	0.13 µg/µl	G2101
1kb DNA Ladder	500 µl	0.1 µg/µl	G5711
For Laboratory Use.			

Description: The DNA Ladders are ladders with defined sizes. The ladders are not intended for use in quantitative analysis. Each ladder is provided with a tube of 6X Blue/Orange Loading Dye.

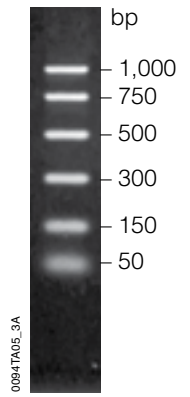
PCR Markers: Six bands of equal intensity of 50, 150, 300, 500, 750 and 1,000bp. The PCR Markers may be run on polyacrylamide gels with less loading volume; however, additional bands may be visible compared to those visible on agarose gels.

100bp DNA Ladder: Eleven fragments that range in size from 100bp to 1,000bp in 100bp increments with an additional band at 1,500bp. The 500bp fragment is present at increased intensity for easy identification. The ladder is dephosphorylated and ready for 5´ end-labeling with radioisotopes using T4 Polynucleotide Kinase, allowing visualization by autoradiography.

1kb DNA Ladder: Thirteen blunt-ended fragments with sizes ranging from 250bp to 10,000bp. The 1,000bp and 3,000bp fragments have increased intensity relative to the other bands on ethidium bromide-stained agarose gels for easy identification. All other fragments are of equal intensity. The ladder is dephosphorylated and ready for 5´ end-labeling with radioisotopes using T4 Polynucleotide Kinase, allowing visualization by autoradiography.

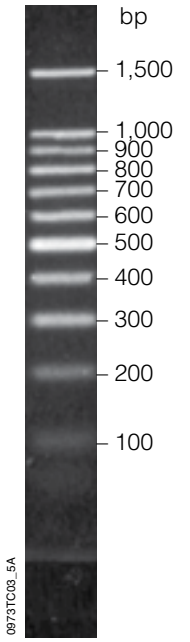
Recommended Loading: Load 5µl/lane.

Storage Conditions: Store at –20°C.



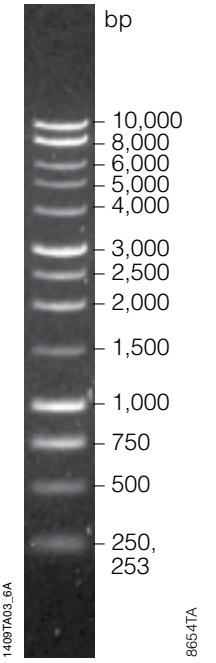
2% agarose

PCR Markers
Cat.# G3161
Load 5µl/lane.



2% agarose

100bp DNA Ladder
Cat.# G2101
Load 5µl/lane.



0.7% agarose

1kb DNA Ladder
Cat.# G5711
Load 5µl/lane.

Conventional DNA Markers

Product	Size	Conc.	Cat.#
Lambda DNA/HindIII Markers	100 µg	0.5 µg/µl	G1711
Lambda DNA/EcoRI Markers	100 µg	0.5 µg/µl	G1721
Lambda DNA/EcoRI + HindIII Markers	100 µg	0.5 µg/µl	G1731
ΦX174 DNA/HaeIII Markers	50 µg	1 µg/µl	G1761
ΦX174 DNA/HinfI Markers	50 µg	1 µg/µl	G1751
pGEM® DNA Markers	50 µg	1 µg/µl	G1741

For Laboratory Use.

Description: The Conventional DNA Digest Markers are created by digesting either λ DNA, ΦX174 replicative form DNA, or plasmids to completion with one or more restriction enzymes. The enzymes are heat-inactivated, and the DNA fragments are either phenol-extracted, then ethanol-precipitated or just ethanol-precipitated. The precipitated fragments are resuspended in storage buffer. The markers are not intended for quantitative analysis. Each marker is supplied with a tube of 6X Blue/Orange Loading Dye.

λ DNA/HindIII Markers: Eight ethanol-precipitated DNA fragments ranging in size from 125bp to 23,130bp.

λ DNA/EcoRI Markers: Six ethanol-precipitated DNA fragments ranging in size from 3,530bp to 21,226bp.

λ DNA/EcoRI + HindIII Markers: Thirteen ethanol-precipitated DNA fragments ranging in size from 125bp to 21,226bp.

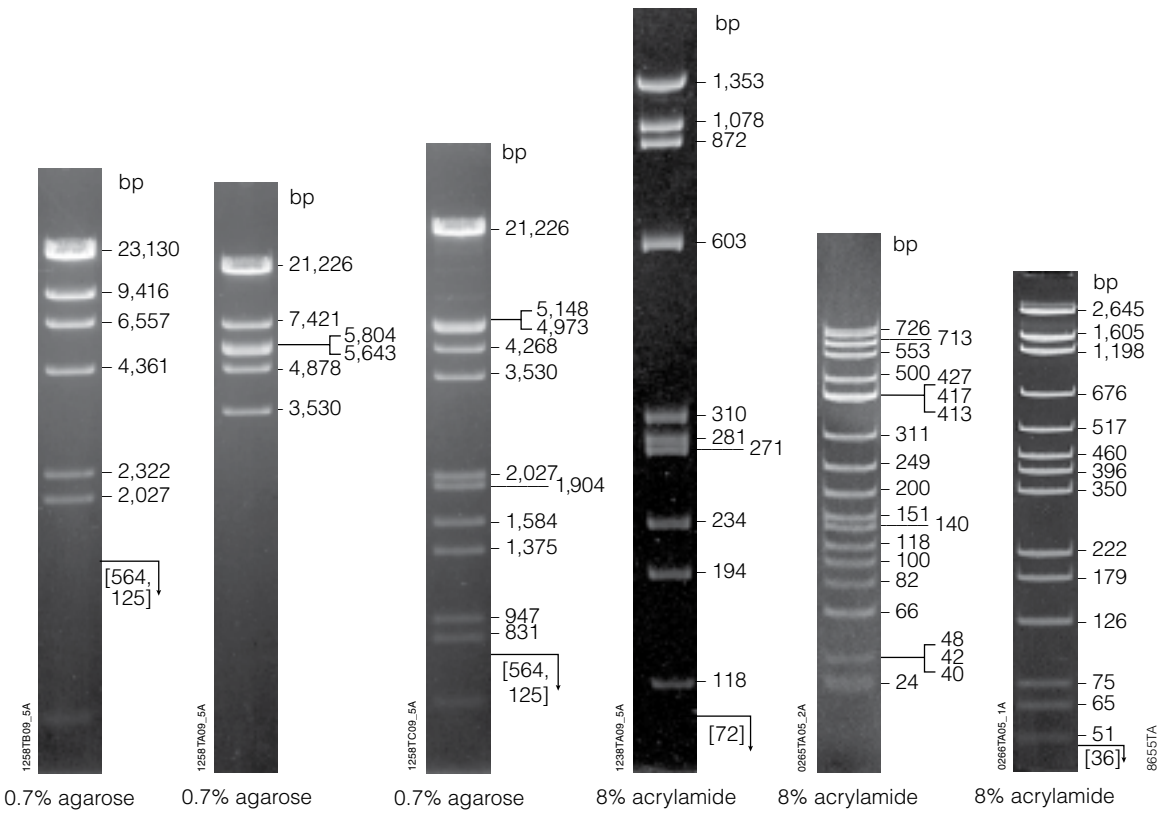
ΦX174 DNA/HaeIII Markers: Eleven phenol-extracted, ethanol-precipitated DNA fragments ranging in size from 72bp to 1,353bp.

ΦX174 DNA/HinfI Markers: Twenty ethanol-precipitated DNA fragments ranging in size from 24bp to 726bp.

pGEM® DNA Markers: Fifteen phenol-extracted, ethanol-precipitated DNA fragments ranging in size from 36bp to 2,645bp. These unique markers are generated from separate digests of pGEM®-3 Vector DNA with HinfI, RsaI and AvaII later combined to form the markers.

Recommended Loading: Load 1µl/lane.

Storage Conditions: Store at –20°C.



Available in the Helix® on-site stocking system

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ΦX174 DNA/HinfI Dephosphorylated Markers

Product	Size	Cat.#
ΦX174 DNA/HinfI Dephosphorylated Markers	2.5 µg	E3511

For Research Use Only. Not for Use in Diagnostic Procedures.

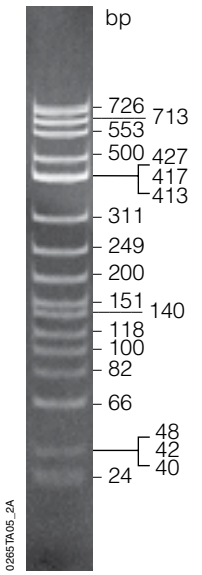
Description: ΦX174 DNA/HinfI Dephosphorylated Markers are prepared by digesting double-stranded ΦX174 DNA to completion with HinfI. The DNA fragments are then treated with calf intestinal alkaline phosphatase, phenol:chloroform-extracted, ethanol-precipitated and resuspended in TE buffer, making the markers ready for 5´ end-labeling. The 20 DNA fragments range in size from 24–726bp. The markers are not intended for use in quantitative analysis.

This marker is especially convenient for applications such as primer extension, requiring DNA or RNA size estimations.

Features:

- **Concentration:** 50µg/ml.
- **Range (bp):** 24–726.
- **Number of Bands:** 20.
- **Convenient:** Ready to label.

Storage Conditions: Store at –20°C.



8% acrylamide

ϕX174 DNA/
HinfI Markers
Cat.# G1751
Load 1µl/lane.

ProMega-Markers® Lambda Ladders

Product	Size	Cat.#
ProMega-Markers® Lambda Ladders	40–60 lanes	G3011

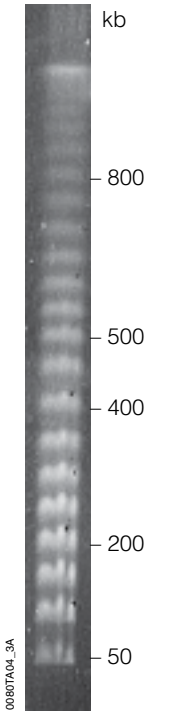
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: ProMega-Markers® Lambda Ladders are prepared by concatemerization of λ phage DNA into multimers ranging in size from 50kb to 800kb and up, with each multimer, or rung, of the 20-step ladder differing in size by one λ genome (approximately 48.5kb). The ladders are embedded in dye-colored, 0.5% agarose string molds in 50mM EDTA. The ladders are not intended for use in quantitative analysis.

Features:

- **Concentration:** 0.5µg/5mm.
- **Range (bp):** 50,000–800,000 and up.

Storage Conditions: Store at 4°C. **Do not freeze.**



0.6% agarose

RNA Markers

Product	Size	Cat.#
RNA Markers	50 µl	G3191

For Research Use Only. Not for Use in Diagnostic Procedures.

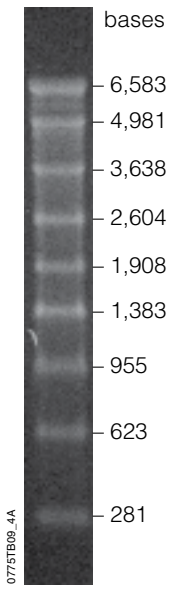
Description: Promega RNA Markers are suitable for size estimation of single-stranded RNA from 0.28–6.58kb in glyoxal or formaldehyde-agarose gels. The RNA Markers consist of a ladder of nine RNA transcripts that are synthesized in vitro from specific templates. The sizes are 281, 623, 955, 1,383, 1,908, 2,604, 3,638, 4,981 and 6,583 bases. The markers are not intended for use in quantitative analysis. After electrophoresis, the fragments can be visualized by ethidium bromide staining.

Recommended Loading: 3µl (prepared in formaldehyde/MOPS buffer and separated onto a 1% formaldehyde-agarose gel using MOPS running buffer).

Features:

- **Range (bases):** 281–6,583.
- **Number of Bands:** 9.

Storage Conditions: Store at –70°C.



1% formaldehyde-agarose

Broad Range Protein Molecular Weight Markers

Product	Size Conc.	Cat.#
Broad Range Protein Molecular Weight Markers	100 lanes 5 µl/lane	V8491

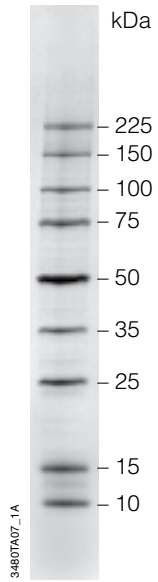
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Broad Range Protein Molecular Weight Markers consist of nine clearly identifiable bands at convenient molecular weights. The protein sizes are 10, 15, 25, 35, 50, 75, 100, 150 and 225kDa. Each protein is present at a concentration of 0.1µg/µl, except for the 50kDa protein, which is present at 0.3µg/µl and serves as a reference indicator, having triple the intensity of the other proteins. All other proteins appear with equal intensity on the gel. These markers are intended for use as a size standard when performing SDS-PAGE (sodium dodecyl sulfate-polyacrylamide gel electrophoresis) for estimation of the molecular weight of the protein of interest. Note that they are not stained.

Features:

- **Reference Band:** Band at 50kDa is 3X intensity for use as a reference.
- **Convenient:** 9 bands at evenly spaced intervals.
- **Fast:** Ready to load.

Storage Conditions: Store at –20°C (weekly/monthly use) or 4°C (daily use).



4–20% Tris-Glycine SDS-PAGE gel

Available in the Helix® on-site stocking system

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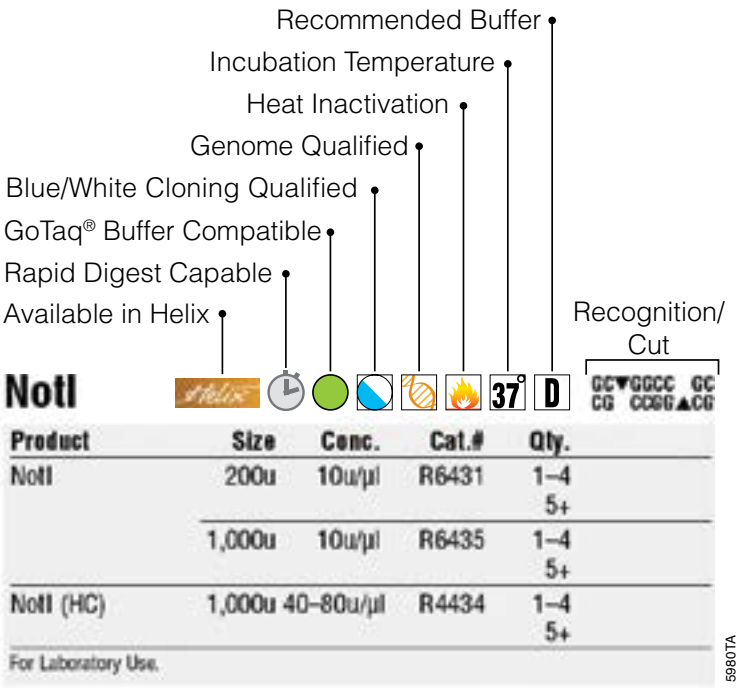
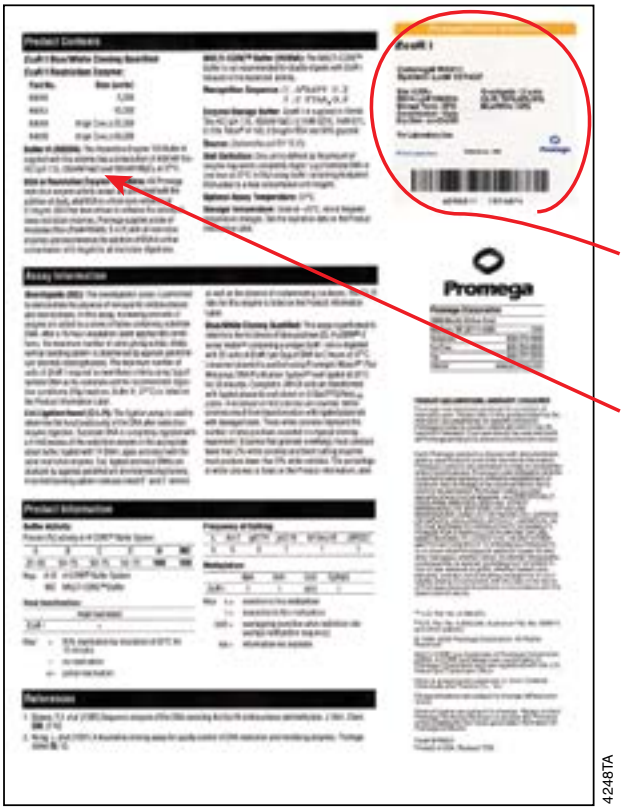
Restriction Enzymes

All the Information You Need—At a Glance

On the following pages, restriction enzyme information is organized using icons to help you quickly and easily identify the features of each enzyme. See the diagram to the right to identify the meaning of the icons used.



Product Usage, Quality Control and Lot-Specific Information



Each enzyme comes in recyclable packaging that holds the enzyme, buffers (if applicable) and a lot-specific Product Information Sheet. The Product Information Sheet contains details of the quality control assays performed, product storage and usage information, protocols and references. Lot-specific information is printed on a removable sticker that can be pasted into a notebook or log book, simplifying your record-keeping.

AgeI

Product	Size	Conc.	Cat.#
AgeI	100 u	3–10 u/µl	R7251
For Research Use Only. Not for Use in Diagnostic Procedures.			

Description:
A▼CCGG T
T GGCC▲A

Features:

- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.
- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

AluI

Product	Size	Conc.	Cat.#
AluI	500 u	10 u/µl	R6281
For Research Use Only. Not for Use in Diagnostic Procedures.			

Description:
AG▼CT
TC▲GA

Features:

- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.

Storage Conditions: Store at –20°C.

ApaI

Product	Size	Conc.	Cat.#
ApaI	5,000 u	10 u/µl	R6361
For Research Use Only. Not for Use in Diagnostic Procedures.			

Description:
G GGCC▼C
C▲CCGG G

Features:

- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

BamHI

Product	Size	Conc.	Cat.#
BamHI	2,500 u	10 u/µl	R6021
	12,500 u	10 u/µl	R6025
BamHI (HC)	12,500 u	40–80 u/µl	R4024
For Research Use Only. Not for Use in Diagnostic Procedures.			

Description:
G▼GATC C
C CTAG▲G

Features:

- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.
- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system

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BclI

Product	Size	Conc.	Cat.#
BclI	1,000 u	10 u/µl	R6651
For Research Use Only. Not for Use in Diagnostic Procedures.			

Description:
T▼GATC A
A CTAG▲T
Storage Conditions: Store at –20°C.

BglI

Product	Size	Conc.	Cat.#
BglI	1,000 u	10 u/µl	R6071
For Research Use Only. Not for Use in Diagnostic Procedures.			

Description:
GCCN NNN▼NGGC
CGGN▲NNN NCCG
Storage Conditions: Store at –20°C.

BglII

Product	Size	Conc.	Cat.#
BglII	500 u	10 u/µl	R6081
	2,500 u	10 u/µl	R6085
For Research Use Only. Not for Use in Diagnostic Procedures.			

Description:
A▼GATC T
T CTAG▲A
Features:
- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

CfoI

Product	Size	Conc.	Cat.#
CfoI	3,000 u	10 u/µl	R6241
For Research Use Only. Not for Use in Diagnostic Procedures.			

Description:
G CG▼C
C▲GC G
Storage Conditions: Store at –20°C.

ClaI

Product	Size	Conc.	Cat.#
ClaI	500 u	10 u/µl	R6551
	2,500 u	10 u/µl	R6555
For Research Use Only. Not for Use in Diagnostic Procedures.			

Description:
AT▼CG AT
TA GC▲TA
Features:
- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.
- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

DdeI

Product	Size	Conc.	Cat.#
DdeI	200 u	10 u/µl	R6291
	1,000 u	10 u/µl	R6295

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
C▼TNA G
G ANT▲C

Features:

- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.

Storage Conditions: Store at –20°C.

DpnI

Product	Size	Conc.	Cat.#
DpnI	200 u	10 u/µl	R6231

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
G^{me}A▼TC
CT▲^{me}AG

Features:

- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.

Storage Conditions: Store at –20°C.

EcoRI

Product	Size	Conc.	Cat.#
EcoRI	5,000 u	12 u/µl	R6011
	15,000 u	12 u/µl	R6017
EcoRI (HC)	25,000 u	40–80 u/µl	R4014

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
G▼AATT C
C TTAA▲G

Features:

- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.

Storage Conditions: Store at –20°C.

EcoRV

Product	Size	Conc.	Cat.#
EcoRV	2,000 u	10 u/µl	R6351
	10,000 u	10 u/µl	R6355

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
GAT▼ATC
CTA▲TAG

Features:

- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.
- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system

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HaeIII

Product	Size	Conc.	Cat.#
HaeIII	2,500 u	10 u/µl	R6171
	10,000 u	10 u/µl	R6175

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
GG▼CC
CC▲GG

Features:

- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.

Storage Conditions: Store at –20°C.

HhaI

Product	Size	Conc.	Cat.#
HhaI	1,000 u	10 u/µl	R6441

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
G CG▼C
C▲GC G

Storage Conditions: Store at –20°C.

HindIII

Product	Size	Conc.	Cat.#
HindIII	5,000 u	10 u/µl	R6041
	15,000 u	10 u/µl	R6045

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
A▼AGCT T
T TCGA▲A

Features:

- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.
- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

HinfI

Product	Size	Conc.	Cat.#
HinfI	1,000 u	10 u/µl	R6201
	5,000 u	10 u/µl	R6205

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
G▼ANT C
C TNA▲G

Storage Conditions: Store at –20°C.

HpaII

Product	Size	Conc.	Cat.#
HpaII	1,000 u	10 u/µl	R6311
	5,000 u	10 u/µl	R6315

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
C▼CG G
G GC▲C

Storage Conditions: Store at –20°C.

I-PpoI (Intron-Encoded Endonuclease)

Product	Size	Conc.	Cat.#
I-PpoI	10,000 u	100–200 u/µl	R7031

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
CTCTC TTAA▼GGTAGC
GAGAG▲AATT CCATCG

Storage Conditions: Store at –20°C.

KpnI

Product	Size	Conc.	Cat.#
KpnI	2,500 u	8–12 u/µl	R6341
	10,000 u	8–12 u/µl	R6345

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
G GTAC▼C
C▲CATG G

Features:

- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.
- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

MboI

Product	Size	Conc.	Cat.#
MboI	200 u	8–12 u/µl	R6711

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
▼GATC
CTAG▲

Storage Conditions: Store at –20°C.

MluI

Product	Size	Conc.	Cat.#
MluI	1,000 u	10 u/µl	R6381

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
A▼CGCG T
T GCGC▲A

Features:

- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

MspI

Product	Size	Conc.	Cat.#
MspI	2,000 u	10 u/µl	R6401
	10,000 u	10 u/µl	R6405

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
C▼CG G
G GC▲C

Storage Conditions: Store at –20°C.

NcoI

Product	Size	Conc.	Cat.#
NcoI	200 u	10 u/µl	R6513
	1,000 u	10 u/µl	R6515

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
C▼CATG G
G GTAC▲C

Features:

- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.
- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

NdeI

Product	Size	Conc.	Cat.#
NdeI	500 u	10 u/µl	R6801

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
CA▼TA TG
GT AT▲AC

Features:

- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.
- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

NheI

Product	Size	Conc.	Cat.#
NheI	250 u	10 u/µl	R6501
	1,250 u	10 u/µl	R6505

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:

G▼CTAG C

C GATC▲G

Features:

- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.
- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

NotI

Product	Size	Conc.	Cat.#
NotI	200 u	10 u/µl	R6431
	1,000 u	10 u/µl	R6435

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:

GC▼GGCC GC

CG CCGG▲CG

Features:

- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.

Storage Conditions: Store at –20°C.

PstI

Product	Size	Conc.	Cat.#
PstI	3,000 u	10 u/µl	R6111
	15,000 u	10 u/µl	R6115

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:

C TGCA▼G

G▲ACGT C

Features:

- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.
- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

PvuI

Product	Size	Conc.	Cat.#
PvuI	100 u	2–10 u/µl	R6321
	500 u	2–10 u/µl	R6325

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:

CG AT▼CG

GC▲TA GC

Features:

- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system

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RsaI

Product	Size	Conc.	Cat.#
RsaI	1,000 u	10 u/µl	R6371
RsaI (HC)	5,000 u	40–80 u/µl	R4374

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
GT▼AC
CA▲TG
Features:

- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.

Storage Conditions: Store at –20°C.

SacI

Product	Size	Conc.	Cat.#
SacI	1,000 u	10 u/µl	R6061
	5,000 u	10 u/µl	R6065

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
G AGCT▼C
C▲TCGA G
Storage Conditions: Store at –20°C.

SacII

Product	Size	Conc.	Cat.#
SacII	500 u	10 u/µl	R6221

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
CC GC▼GG
GG▲CG CC
Features:

- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

SalI

Product	Size	Conc.	Cat.#
SalI	2,000 u	10 u/µl	R6051
	10,000 u	10 u/µl	R6055

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
G▼TCGA C
C AGCT▲G
Features:

- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.
- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

ScaI

Product	Size	Conc.	Cat.#
ScaI	1,000 u	8–12 u/µl	R6211

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
AGT▼ACT
TCA▲TGA
Features:

- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.

Storage Conditions: Store at –20°C.

SgfI

Product	Size	Conc.	Cat.#
SgfI	250 u	8–12 u/µl	R7103
For Research Use Only. Not for Use in Diagnostic Procedures.			

Description:
GCG AT▼CGC
CGC▲TA GCG
Storage Conditions: Store at –20°C. **Do not freeze.**

SmaI

Product	Size	Conc.	Cat.#
SmaI	1,000 u	8–12 u/µl	R6121
	5,000 u	8–12 u/µl	R6125
For Research Use Only. Not for Use in Diagnostic Procedures.			

Description:
CCC▼GGG
GGG▲CCC
Storage Conditions: Store at –20°C.

SpeI

Product	Size	Conc.	Cat.#
SpeI	200 u	10 u/µl	R6591
	1,000 u	10 u/µl	R6595
For Research Use Only. Not for Use in Diagnostic Procedures.			

Description:
A▼CTAG T
T GATC▲A
Features:
- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.

Storage Conditions: Store at –20°C.

SphI

Product	Size	Conc.	Cat.#
SphI	200 u	10 u/µl	R6261
	1,000 u	10 u/µl	R6265
For Research Use Only. Not for Use in Diagnostic Procedures.			

Description:
G CATG▼C
C▲GTAC G
Features:
- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.
- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

TaqI

Product	Size	Conc.	Cat.#
TaqI	1,000 u	10 u/µl	R6151
	10,000 u	10 u/µl	R6155
For Research Use Only. Not for Use in Diagnostic Procedures.			

Description:
T▼CG A
A GC▲T
Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system

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XbaI

Product	Size	Conc.	Cat.#
XbaI	2,000 u	8–12 u/µl	R6181
	10,000 u	8–12 u/µl	R6185

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
T▼CTAG A
A GATC▲T

Features:

- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.
- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

XhoI

Product	Size	Conc.	Cat.#
XhoI	3,000 u	10 u/µl	R6161
	10,000 u	10 u/µl	R6165

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
C▼TCGA G
G AGCT▲C

Features:

- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.
- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

MULTI-CORE™ Buffer Pack

Product	Size	Cat.#
MULTI-CORE™ Buffer Pack	3 × 1 ml	R9991

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The MULTI-CORE™ Buffer Pack contains convenient aliquots of the Promega universal restriction enzyme 10X buffer. The MULTI-CORE™ Buffer is formulated to provide simple buffering conditions for performing multiple digestions. Many Promega restriction enzymes have between 50% and 100% activity in reactions using MULTI-CORE™ Buffer.

Features:

- **Convenient and Economical:** MULTI-CORE™ Buffer enables co-digestion of DNA with more than one enzyme in a single reaction. In most cases, only modest adjustments in the amount of enzyme used will ensure complete multiple digestions.

Storage Conditions: Store at –20°C.

4-CORE® Buffer Pack

Product	Size	Cat.#
4-CORE® Buffer Pack (Buffers A, B, C and D), 1ml each	4 ml	R9921

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The 4-CORE® Buffer Pack contains convenient aliquots of Promega Restriction Enzyme 10X Buffers A, B, C and D. The majority of Promega restriction enzymes have optimal activity in one of these four 10X reaction buffers.

Storage Conditions: Store at –20°C.

Bovine Serum Albumin, Acetylated

Product	Size	Conc.	Cat.#
Bovine Serum Albumin, Acetylated	1 ml	10 mg/ml	R3961
	400 µl	1 µg/µl	R9461

R3961 For Laboratory Use.
R9461 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Bovine Serum Albumin, Acetylated, can be used as an enzyme stabilizer or as a carrier protein. It is prepared by a modification of the method of Gonzalez *et al.* and dialyzed extensively with deionized water to remove impurities.

Features:

- **Quality Tested:** Each lot of BSA is tested and certified to be free of DNase and RNase activity.

Storage Conditions: Store at –20°C.

Alkaline Phosphatases

Alkaline Phosphatase, Calf Intestinal (CIAP)

Product	Size	Conc.	Cat.#
Alkaline Phosphatase, Calf Intestinal	1,000 u	1 u/µl	M1821
Alkaline Phosphatase, Calf Intestinal (HC)	1,000 u	20 u/µl	M2825
Available Separately	**Size**		**Cat.#**
CIAP Buffer Pack	1.5 ml		M1833

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Alkaline Phosphatase, Calf Intestinal (CIAP), catalyzes the hydrolysis of 5′-phosphate groups from DNA, RNA, and ribo- and deoxyribonucleoside triphosphates. This enzyme is used to prevent recircularization and religation of linearized cloning vector DNA by removing phosphate groups from both 5′-termini and may also be used for the dephosphorylation of 5′ phosphorylated ends of DNA or RNA for subsequent labeling with [32P]ATP and T4 Polynucleotide Kinase. CIAP is active on 5′ overhangs, 5′ recessed and blunt ends.

Features:

- **Available at High Concentration:** Cat.# M2825 contains 1,000 units of CIAP at 20u/µl.
- **Blue/White Cloning Qualified:** Promega's blue/white cloning assay provides a higher level of quality control for enzymes used in cloning applications.
- **Provided with 10X Reaction Buffer:** 0.5M Tris-HCl (pH 9.3 at 25°C), 10mM $MgCl_2$, 1mM $ZnCl_2$, 10mM spermidine.

Storage Conditions: Store at –20°C.

TSAP Thermosensitive Alkaline Phosphatase

Product	Size	Cat.#
TSAP Thermosensitive Alkaline Phosphatase	100 units	M9910

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: TSAP Thermosensitive Alkaline Phosphatase catalyzes the removal of 5′ phosphate groups from DNA, thus preventing the recircularization and religation of linearized cloning vector DNA during ligation. It is effective on 3′ overhangs, 5′ overhangs and blunt ends. It is also useful for preparing DNA for 5′ end-labeling by removing existing phosphate groups from the 5′ end.

TSAP is irreversibly inactivated by heating at 74°C for 15 minutes. Therefore, a DNA cleanup step is not required before proceeding to a ligation reaction. TSAP is fully active in all restriction enzyme reaction buffers tested under the conditions listed below, facilitating a streamlined restriction digestion, dephosphorylation and ligation reaction.

Features:

- **Easy To Use:** TSAP is active in all Promega restriction enzyme buffers, eliminating any cleanup steps or buffer swaps.
- **Convenient:** TSAP is irreversibly inactivated by heating at 74°C for 15 minutes. This allows streamlining of the restriction enzyme digestion, dephosphorylation and ligation procedure by eliminating the need for cleanup after alkaline phosphatase treatment.
- **Blue/White Cloning-Qualified:** Promega's blue/white cloning assay provides a higher level of quality control for enzymes used in cloning applications.
- **Provided with Promega MULTI-CORE™ Buffer.**

Storage Conditions: Store at –20°C. See the expiration date on the label.

Polymerases

DNA Polymerase I

Product	Size	Conc.	Cat.#
DNA Polymerase I	500 u	5–10 u/µl	M2051
	2,500 u	5–10 u/µl	M2055

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: DNA Polymerase I catalyzes the template-directed polymerization of nucleotides into duplex DNA in a 5′→3′ direction. DNA Polymerase I possesses a 3′→5′ exonuclease activity or "proofreading" function, which lowers the error rate during DNA replication, and also contains a 5′→3′ exonuclease activity, which enables the enzyme to replace nucleotides in the growing strand of DNA by nick translation. The enzyme, purified from recombinant *E. coli*, is capable of catalyzing de novo synthesis of synthetic homopolymers and provides a convenient method for the preparation of a variety of defined DNA substrates.

Features:

- **Flexible:** DNA Polymerase I may be used in a variety of molecular applications.
- **May Be Heat-Inactivated:** DNA Polymerase I is inactivated by heating at 68°C for 10 minutes.
- **Provided with 10X Reaction Buffer:** 500mM Tris-HCl (pH 7.2 at 25°C), 100mM $MgSO_4$, 1mM DTT.

Storage Conditions: Store at –20°C.

DNA Polymerase I Large (Klenow) Fragment

Product	Size	Conc.	Cat.#
DNA Polymerase I Large (Klenow) Fragment	150 u	5 u/µl	M2201
	500 u	5 u/µl	M2206

For Laboratory Use.

Description: DNA Polymerase I Large (Klenow) Fragment is a DNA-dependent DNA polymerase that lacks the 5′→3′ exonuclease activity of intact *E. coli* DNA Polymerase I but retains its 5′→3′ polymerase, 3′→5′ exonuclease and strand displacement activities. The enzyme is a 68kDa C-terminal fragment of DNA Polymerase I. The 5′→3′ polymerase activity of Klenow Fragment can be used to fill in 5′-protruding ends with unlabeled or labeled dNTPs, to sequence single- or double-stranded DNA templates, for in vitro mutagenesis using synthetic oligonucleotides, for cDNA second-strand synthesis and to generate single-stranded DNA probes. The 3′→5′ exonuclease activity can be used to generate blunt ends from a 3′-overhang.

Features:

- **Flexible:** DNA Polymerase I Large (Klenow) Fragment may be used in a variety of molecular applications. It is also active in many Promega 1X restriction enzyme buffers.
- **May Be Heat-Inactivated:** DNA Polymerase I Large (Klenow) Fragment is inactivated by heating at 75°C for 10 minutes.
- **Provided with 10X Reaction Buffer:** 500mM Tris-HCl (pH 7.2 at 25°C), 100mM $MgSO_4$, 1mM DTT.

Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system

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DNA Polymerase I Large (Klenow) Fragment, Exonuclease Minus

Product	Size	Conc.	Cat.#
Klenow Fragment, Exonuclease Minus	100 u	5–10 u/µl	M2181

For Laboratory Use.

Description: DNA Polymerase I Large (Klenow) Fragment, Exonuclease Minus, is a DNA-dependent DNA polymerase that lacks both the 5′→3′ and the 3′→5′ exonuclease activities present in intact *E. coli* DNA Polymerase I. It is used for random primer labeling and in strand displacement amplification. Klenow Fragment, Exonuclease Minus, will leave a single-base 3′ overhang on a significant proportion of DNA fragments during fill-in of 5′-overhangs. Therefore, this enzyme is not recommended for preparation of blunt-ended fragments for ligation.

Features:

- **Provided with 10X Reaction Buffer:** 500mM Tris-HCl (pH 7.2 at 25°C), 100mM $MgSO_4$, 1mM DTT.
- **May Be Heat-Inactivated:** DNA Polymerase I Large (Klenow) Fragment, Exonuclease Minus, is inactivated by heating at 75°C for 10 minutes.

Storage Conditions: Store at –20°C.

T4 DNA Polymerase

Product	Size	Conc.	Cat.#
T4 DNA Polymerase	100 u	5–10 u/µl	M4211
	500 u	5–10 u/µl	M4215

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: T4 DNA Polymerase catalyzes the 5′→3′ synthesis of DNA from a primed single-stranded DNA template. Although possessing a potent 3′→5′ proofreading exonuclease, T4 DNA Polymerase contains no 5′→3′ exonuclease activity. T4 DNA Polymerase can be used to fill 5′ protruding ends with labeled or unlabeled dNTPs or for the generation of blunt ends from DNA molecules with 3′ overhangs.

Features:

- **High Fidelity:** T4 DNA Polymerase is the enzyme of choice for applications where misincorporation is a concern.
- **Flexible:** T4 DNA Polymerase may be used in a variety of molecular applications. Active in many Promega 1X restriction enzyme buffers.
- **May Be Heat-Inactivated:** T4 DNA Polymerase is inactivated by heating at 75°C for 10 minutes.
- **Provided with 10X Reaction Buffer:** 250mM Tris-acetate (pH 7.7), 1M potassium acetate, 100mM magnesium acetate and 10mM DTT.

Storage Conditions: Store at –20°C.

SP6 RNA Polymerase

Product	Size	Conc.	Cat.#
SP6 RNA Polymerase	1,000 u	10–20 u/µl	P1085
	5,000 u	10–20 u/µl	P1081
SP6 RNA Polymerase (HC)	2,500 u	80 u/µl	P4084

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: SP6 RNA Polymerase is a DNA-dependent RNA polymerase that exhibits extremely high specificity for its cognate promoter sequences. Only SP6 DNA or DNA cloned downstream from an SP6 promoter can serve as a template for SP6 RNA Polymerase-directed RNA synthesis.

Features:

- **Specific:** SP6 RNA Polymerase exhibits extremely high affinity and specificity for SP6 promoter sequences.
- **Highly Pure:** SP6 RNA Polymerase is >90% pure as determined by SDS polyacrylamide gel electrophoresis. Free of detectable levels of contaminating RNase and DNase activity (<1% release).
- **Flexible:** Will incorporate ^{32}P, ^{33}P, ^{3}H and ^{35}S nucleoside triphosphates.
- **Provided with 5X Reaction Buffer:** Provided with 100mM DTT and Transcription Optimized 5X Buffer: 200mM Tris-HCl (pH 7.9 at 25°C), 30mM $MgCl_2$, 10mM spermidine, 50mM NaCl.

Storage Conditions: Store at –20°C.

T3 RNA Polymerase

Product	Size	Conc.	Cat.#
T3 RNA Polymerase	1,000 u	10–20 u/µl	P2083
T3 RNA Polymerase (HC)	2,500 u	80 u/µl	P4024
For Research Use Only. Not for Use in Diagnostic Procedures.			

Description: T3 RNA Polymerase is a DNA-dependent RNA polymerase that exhibits extremely high specificity for its cognate promoter sequences. Only T3 DNA or DNA cloned downstream from a T3 promoter can serve as a template for T3 RNA Polymerase-directed RNA synthesis.

Features:

- **Specific:** T3 RNA Polymerase exhibits extremely high affinity and specificity for T3 promoter sequences.
- **Highly Pure:** T3 RNA Polymerase is >90% pure as determined by SDS polyacrylamide gel electrophoresis. Free of detectable levels of contaminating RNase and DNase activity (<1% release).
- **Flexible:** Will incorporate ^{32}P, ^{33}P, ^{3}H and ^{35}S nucleoside triphosphates.
- **Provided with 5X Reaction Buffer:** Provided with 100mM DTT and Transcription Optimized 5X Buffer: 200mM Tris-HCl (pH 7.9 at 25°C), 30mM $MgCl_2$, 10mM spermidine, 50mM NaCl.

Storage Conditions: Store at –20°C.

T7 RNA Polymerase

Product	Size	Conc.	Cat.#
T7 RNA Polymerase	1,000 u	10–20 u/µl	P2075
	5,000 u	10–20 u/µl	P2077
T7 RNA Polymerase (HC)	10,000 u	80 u/µl	P4074
For Research Use Only. Not for Use in Diagnostic Procedures.			

Description: T7 RNA Polymerase is a DNA-dependent RNA polymerase that exhibits extremely high specificity for its cognate promoter sequences. Only T7 DNA or DNA cloned downstream from a T7 promoter can serve as a template for T7 RNA Polymerase-directed RNA synthesis.

Features:

- **Specific:** T7 RNA Polymerase exhibits extremely high affinity and specificity for T7 promoter sequences.
- **Highly Pure:** T7 RNA Polymerase is judged to be greater than 90% pure as determined by SDS polyacrylamide gel electrophoresis. Free of detectable levels of contaminating RNase and DNase activity (<1% release).
- **Flexible:** Will incorporate ^{32}P, ^{33}P, ^{3}H and ^{35}S nucleoside triphosphates.
- **Provided with 5X Reaction Buffer:** Provided with 100mM DTT and Transcription Optimized 5X Buffer: 200mM Tris-HCl (pH 7.9 at 25°C), 30mM $MgCl_2$, 10mM spermidine, 50mM NaCl.

Storage Conditions: Store at –20°C.

RNA Polymerase Promoter Sequencing Primer

Product	Size	Conc.	Cat.#
SP6 Promoter Primer	2 µg	10 µg/ml	Q5011
For Research Use Only. Not for Use in Diagnostic Procedures.			

Description: The SP6 Promoter Primer is designed for sequencing inserts cloned into the pGEM® Vectors, pALTER®-MAX Vector and pCI-neo Vectors. The primer is designed to be annealed to single-stranded DNA or, after alkaline denaturation, to double-stranded DNA. The promoter primer is purified by gel electrophoresis or HPLC.

Primer Sequence

- SP6: 5´-d(TATTTAGGTGACACTATAG)-3´

Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system

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Ligases

LigaFast™ Rapid DNA Ligation System

Product	Size	Cat.#
LigaFast™ Rapid DNA Ligation System	30 reactions	M8221
	150 reactions	M8225
Available Separately	**Size**	**Cat.#**
2X Rapid Ligation Buffer	1.5 ml	C6711

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The LigaFast™ Rapid DNA Ligation System is designed for the efficient ligation of sticky-ended DNA inserts into plasmid vectors in just 5 minutes (blunt-ended inserts in as little as 15 minutes). Rapid ligation is based on the combination of T4 DNA Ligase with a unique 2X Rapid Ligation Buffer. The LigaFast™ System is designed to eliminate any further purification prior to transformation of ligated DNA. The specially formulated 2X Rapid Ligation Buffer requires no additional ATP or Mg^{2+} addition prior to use.

Features:

- **Flexible:** Use with 5′, 3′ or blunt-ended DNA inserts.
- **Fast:** Ligation of cohesive ends in 5 minutes, blunt ends in 15 minutes at room temperature.
- **Convenient:** No requirement to purify ligated DNA prior to heat-shock transformation in *E. coli*. Ligations conducted at room temperature.
- **Ready-To-Use:** No additional buffer modifications required prior to use.
- **Efficient:** Ligations performed using the LigaFast™ System are comparable to standard overnight ligations.
- **Blue/White Cloning Qualified:** Promega's blue/white cloning assay provides a higher level of quality control for enzymes used in cloning applications.

Storage Conditions: Store at –20°C.

T4 DNA Ligase

Product	Size	Conc.	Cat.#
T4 DNA Ligase	100 u	1–3 u/µl	M1801
	500 u	1–3 u/µl	M1804
T4 DNA Ligase (HC)	500 u	10–20 u/µl	M1794
Available Separately	**Size**		**Cat.#**
T4 DNA Ligase Buffer Pack	1.5 ml		C1263

C1263 For Research Use Only. Not for Use in Diagnostic Procedures. M1801, M1804, M1794 For Laboratory Use.

Description: T4 DNA Ligase catalyzes the joining of two strands of DNA between the 5′-phosphate and the 3′-hydroxyl groups of adjacent nucleotides in either a cohesive-ended or blunt-ended configuration. The enzyme has also been shown to catalyze the joining of RNA to either a DNA or RNA strand in a duplex molecule but will not join single-stranded nucleic acids.

The T4 DNA Ligase Buffer Pack includes 3 tubes of T4 DNA Ligase 10X Reaction Buffer. The composition of the 10X reaction buffer is 300mM Tris-HCl (pH 7.8 at 25°C), 100mM $MgCl_2$, 100mM DTT and 10mM ATP.

Features:

- **Available at High Concentration:** Cat.# M1794 contains 500 units of T4 DNA Ligase at 10–20u/µl.
- **Flexible:** Use with 5′, 3′ or blunt-ended DNA inserts.
- **Provided with 10X Reaction Buffer:** 300mM Tris-HCl (pH 7.8 at 25°C), 100mM $MgCl_2$, 100mM DTT and 10mM ATP.
- **Blue/White Cloning Qualified:** Promega's blue/white cloning assay provides a higher level of quality control for enzymes used in cloning applications.

Storage Conditions: Store at –20°C.

T4 RNA Ligase

Product	Size	Conc.	Cat.#
T4 RNA Ligase	500 u	10 u/µl	M1051

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: T4 RNA Ligase catalyzes the ATP-dependent ligation of single-stranded RNA or DNA onto the 5′-phosphoryl termini of single-stranded RNA or DNA. The enzyme, purified from recombinant *E. coli* CA4 (RNase I-deficient), has an apparent molecular weight of 43.5kDa. T4 RNA Ligase also catalyzes the addition of [5′-^{32}P] nucleoside 3′,5′-bis (phosphate) onto single-stranded RNA.

Features:

- **May Be Heat-Inactivated:** T4 RNA Ligase may be inactivated by heating at 65°C for 15 minutes.
- **Provided with 10X Reaction Buffer:** 500mM Tris-HCl (pH 7.8 at 25°C), 100mM $MgCl_2$, 50mM DTT, 10mM ATP.

Storage Conditions: Store at –20°C.

T4 Polynucleotide Kinase

Product	Size	Conc.	Cat.#
T4 Polynucleotide Kinase	100 u	5–10 u/µl	M4101
	1,000 u	5–10 u/µl	M4103
Available Separately	**Size**		**Cat.#**
T4 PNK Buffer Pack	1.5 ml		C1313

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: T4 Polynucleotide Kinase catalyzes the transfer of the γ-phosphate from ATP to the 5′-terminus of polynucleotides or to mononucleotides bearing a 5′-hydroxyl group. The enzyme, purified from recombinant *E. coli*, may be used to phosphorylate RNA, DNA and synthetic oligonucleotides prior to subsequent manipulations such as ligation.

Features:

- **May Be Heat-Inactivated:** T4 Polynucleotide Kinase may be inactivated by heating at 68°C for 10 minutes.
- **Provided with 10X Reaction Buffer:** 700mM Tris-HCl (pH 7.6 at 25°C), 100mM $MgCl_2$, 50mM DTT.
- **Blue/White Cloning Qualified:** Promega's blue/white cloning assay provides a higher level of quality control for enzymes used in cloning applications.

Storage Conditions: Store at –20°C.

DNA 5′ End-Labeling System

Product	Size	Cat.#
DNA 5′ End-Labeling System	10 reactions	U2010

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The DNA 5′ End-Labeling System is a complete system for phosphorylating both double- and single-stranded DNA and RNA with T4 Polynucleotide Kinase and [γ-^{32}P]ATP. The system includes enzymes, buffers and control DNA standards to measure reaction efficiencies. Calf Intestinal Alkaline Phosphatase is included for removal of the 5′-phosphate prior to labeling with T4 Polynucleotide Kinase.

Features:

- **Convenient:** Can use to label both single-stranded and double-stranded DNA and RNA.
- **Complete:** System includes enzymes, buffers and control DNA standards for measuring reaction efficiencies (except radionucleotides).
- **Flexible:** Works with [γ-^{32}P]ATP, [γ-^{33}P]ATP or [γ-^{35}S]ATP.

Storage Conditions: Store at –20°C.

Prime-a-Gene® Labeling System

Product	Size	Cat.#
Prime-a-Gene® Labeling System	30 reactions	U1100
Available Separately		
Nuclease-Free Water	150 ml	P1195
Labeling 5X Buffer	300 µl	U1151

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Prime-a-Gene® Labeling System provides a complete set of complementary reagents, including Labeling 5X Buffer that contains random synthetic hexadeoxynucleotide primers for random-primed labeling of linear template DNA with radionucleotides. As little as 25ng of input DNA can be used to generate probes with specific activities >1 × 10^{9}cpm/µg.

Features:

- **Ready to Use:** Includes reagents needed for random-primed labeling of linear DNA, including random synthetic hexadeoxynucleotide primers (excluding radionucleotides).
- **High Specific Activity:** Probes with specific activities >1 × 10^{9}cpm/µg can be generated.

Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system

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Nucleases

Exonuclease III

Product	Size	Conc.	Cat.#
Exonuclease III	5,000 u	150–200 u/µl	M1811
	25,000 u	150–200 u/µl	M1815

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Exonuclease III is a 3′→5′ exonuclease specific for double-stranded DNA. The enzyme catalyzes the stepwise removal of mononucleotides starting from a 3′-OH at nicks, blunt ends, recessed ends and 3′-overhangs of less than 4 bases, yielding nucleoside 5′-phosphates. Exonuclease III will also degrade DNA from 3′-phosphate ends due to its intrinsic 3′-phosphatase activity. In addition, the enzyme has apurinic endonuclease activity and ribonuclease H activity. Exonuclease III is used in conjunction with S1 nuclease for unidirectional deletion of sequences from the termini of DNA fragments.

Features:

- **Flexible:** Control deletion rate by varying incubation temperature.
- **May Be Heat-Inactivated:** Exonuclease III may be inactivated by heating to 75°C for 10 minutes.
- **Provided with 10X Reaction Buffer:** 660mM Tris-HCl (pH 8.0 at 25°C), 6.6mM $MgCl_2$.

Storage Conditions: Store at –20°C.

Mung Bean Nuclease

Product	Size	Conc.	Cat.#
Mung Bean Nuclease	2,000 u	50–100 u/µl	M4311

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Mung Bean Nuclease catalyzes the degradation of single-stranded DNA and RNA endonucleolytically to yield 5′-phosphoryl-terminated products. While the nuclease prefers ssDNA over dsDNA by 30,000-fold, at very high concentrations the enzyme degrades double-stranded DNA from both ends. Mung Bean Nuclease has been used for transcript mapping studies, for flushing staggered ends and for the separation of cDNA strands after synthesis with reverse transcriptase and DNA Polymerase I.

Features:

- **Provided with 10X Reaction Buffer:** 300mM sodium acetate (pH 5.0 at 15°C), 500mM NaCl, 10mM $ZnCl_2$.

Storage Conditions: Store at –20°C.

Ribonuclease H

Product	Size	Conc.	Cat.#
Ribonuclease H	50 u	0.5–2 u/µl	M4281
	250 u	0.5–2 u/µl	M4285

For Laboratory Use.

Description: Ribonuclease H (RNase H) is an endonuclease that specifically hydrolyzes the phosphodiester bonds of RNA hybridized to DNA to produce 3′-OH and 5′-P-terminated products. It will not degrade single-stranded nucleic acids, double-stranded DNA or double-stranded RNA.

Storage Conditions: Store at –20°C.

RNase ONE™ Ribonuclease

Product	Size	Conc.	Cat.#
RNase ONE™ Ribonuclease	1,000 u	5–10 u/µl	M4261
	5,000 u	5–10 u/µl	M4265

For Laboratory Use.

Description: RNase ONE™ Ribonuclease is a 27kDa periplasmic enzyme from *E. coli* that catalyzes the degradation of RNA to cyclic nucleotide monophosphate (NMP) intermediates. Slower hydrolysis further catalyzes the degradation of these intermediates to 3′-NMPs. RNase ONE™ Ribonuclease is one of the few known RNases that can cleave a phosphodiester bond between any two ribonucleotides. RNase ONE™ Ribonuclease may be used to remove RNA from DNA preparations, for RNase protection assays and for mapping or quantitation of RNA by selective cleavage of single-stranded regions.

Features:

- **Flexible:** RNase ONE™ Ribonuclease has the ability to cleave phosphodiester bonds between any two ribonucleotides.
- **Provided with 10X Reaction Buffer:** 100mM Tris-HCl (pH 7.5 at 25°C), 50mM EDTA, 2M sodium acetate.

Storage Conditions: Store at –20°C. **Do not freeze at –70°C. Do not store on dry ice.**

RQ1 RNase-Free DNase

Product	Size	Conc.	Cat.#
RQ1 RNase-Free DNase	1,000 u	1 u/µl	M6101
For Laboratory Use.			

Description: RQ1 RNase-Free DNase is a preparation of deoxyribonuclease I that degrades single-stranded or double-stranded DNA to produce 3′-hydroxyl oligonucleotides. This preparation is qualified for use in applications where maintaining the integrity of RNA is critical.

Features:

- **Convenient:** 10X Reaction Buffer (400mM Tris-HCl [pH 8.0 at 25°C], 100mM $MgSO_4$, 10mM $CaCl_2$) and Stop Buffer (20mM EGTA [pH 8.0 at 25°C]) are provided.

Storage Conditions: Store at –20°C.

S1 Nuclease

Product	Size	Conc.	Cat.#
S1 Nuclease	10,000 u	20–100 u/µl	M5761
For Research Use Only. Not for Use in Diagnostic Procedures.			

Description: S1 Nuclease degrades single-stranded DNA and RNA endonucleolytically to yield 5′-phosphoryl-terminated products. Double-stranded nucleic acids (DNA:DNA, DNA:RNA or RNA:RNA) are resistant to degradation except with extremely high concentrations of enzyme. The enzyme is used to remove single-stranded termini from double-stranded DNA, for selective cleavage of single-stranded DNA and for mapping RNA transcripts.

Features:

- **Provided with 10X Reaction Buffer:** 0.5M sodium acetate (pH 4.5 at 25°C), 2.8M NaCl, 45mM $ZnSO_4$.

Storage Conditions: Store at –20°C.

Additional Enzymes

Single-Stranded DNA Binding Protein

Product	Size	Conc.	Cat.#
Single-Stranded DNA Binding Protein	100 µg	1–5 µg/µl	M3011
For Research Use Only. Not for Use in Diagnostic Procedures.			

Description: *E. coli* Single-Stranded DNA Binding Protein (SSB) consists of four identical 18.9kDa subunits. It binds with high affinity in a cooperative manner to single-stranded DNA but does not bind well to double-stranded DNA. It is involved in DNA replication and in recombination in vivo.

Storage Conditions: Store at –20°C.

Terminal Deoxynucleotidyl Transferase, Recombinant

Product	Size	Conc.	Cat.#
Terminal Deoxynucleotidyl Transferase, Recombinant	300 u	30 u/µl	M1871
	1,500 u	30 u/µl	M1875
Available Separately	**Size**		**Cat.#**
Terminal Transferase Buffer Pack	3 × 500 µl		M1893
For Research Use Only. Not for Use in Diagnostic Procedures.			

Description: Terminal Deoxynucleotidyl Transferase, Recombinant, catalyzes the repetitive addition of mononucleotides to the terminal 3′-OH of a DNA initiator accompanied by the release of inorganic phosphate. Single-stranded DNA is preferred as an initiator. Polymerization is not template-dependent. The addition of 1mM Co^{2+} (as $CoCl_2$) in the reaction buffer allows the tailing of 3′-ends with varying degrees of efficiency.

Features:

- **Tails Any Type of 3′ End:** The presence of 1mM $CoCl_2$ in the reaction buffer allows the tailing of any type of 3′ end (3′ and 5′ overhangs or blunt ends).
- **Tested for Apoptotic DNA Labeling:** Each lot of enzyme is qualified for success in the procedure outlined in the *DeadEnd™ Fluorometric TUNEL System Technical Bulletin* #TB235.
- **Provided with 5X Reaction Buffer:** 500mM cacodylate buffer (pH 6.8 at 25°C), 5mM $CoCl_2$, 0.5mM DTT.

Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system

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Ribonuclease Inhibitors

RNasin® Ribonuclease Inhibitors

Product	Size	Conc.	Cat.#
RNasin® Ribonuclease Inhibitor	2,500 u	20–40 u/µl	N2111
	10,000 u	20–40 u/µl	N2115
Recombinant RNasin® Ribonuclease Inhibitor	2,500 u	20–40 u/µl	N2511
	10,000 u	20–40 u/µl	N2515
RNasin® Plus RNase Inhibitor	2,500 u	40 u/µl	N2611
	10,000 u	40 u/µl	N2615

N2111, N2115 For Research Use Only. Not for Use in Diagnostic Procedures. N2511, N2515, N2611, N2615 For Laboratory Use.

Description: RNases are ubiquitous and can cause RNA degradation and compromise RNA integrity. Native and Recombinant RNasin® Inhibitors are 50kDa proteins that inhibit RNase A family and human placental RNases by noncovalently binding to RNases in a 1:1 ratio.

RNasin® Plus RNase Inhibitor is a recombinant mammalian RNase inhibitor that is expressed as a soluble protein in *E. coli*, allowing easy purification through a combination of ion exchange and hydrophobic interaction chromatography. The protein is capable of inhibiting eukaryotic RNases (e.g., RNase A and RNase B) similarly to human placental RNase inhibitor. RNasin® Plus RNase Inhibitor is tested in RT-PCR and compatible with enzymes such as AMV, M-MLV and ImProm-II™ Reverse Transcriptases or *Taq* and *Tfl* DNA Polymerases. RNasin® Plus RNase Inhibitor also is tested and compatible with quantitative, real-time RT-PCR in a TaqMan® assay.

RNasin® Plus RNase Inhibitor offers increased resistance to oxidation over the human version of the protein. Two cysteines in the human protein have been identified as especially sensitive to oxidation and react by forming a disulfide bond that can block the active site of the inhibitor. RNasin® Plus, through natural amino acid diversity, lacks the ability to form this site-blocking disulfide. In addition, the new protein has characteristics never before realized, including continued inhibition of RNases above 50°C. Heating solutions of RNasin® Plus and RNase followed by cooling does not result in the reappearance of RNase activity—even when the solution is heated above the denaturation temperature of the RNasin® Plus protein alone. This allows RNasin® Plus to protect RNA species prior to, during and after heating, even at temperatures normally used during first-strand DNA synthesis in RT-PCR. Solutions heated up to 70°C for 15 minutes did not result in RNase reactivation.

Features:

- **Achieve Broad-Spectrum RNase Inhibition:** Inhibits common eukaryotic RNases.
- **Use with Many Enzymes:** Does not inhibit SP6, T7 or T3 RNA Polymerase; GoScript™ Reverse Transcriptase, AMV or M-MLV Reverse Transcriptase; or *Taq* DNA polymerase.
- **Use in Many Downstream Assays:** Functional across wide pH range (pH 5–8).
- **Choose Native or Recombinant Form:** Recombinant form is made in bacteria, minimizing the chances of human nucleic acid contamination.

With RNasin® Plus RNase Inhibitor, you also can:

- **Improve Resistance to Oxidation:** Due to natural amino acid diversity, RNasin® Plus lacks the capability to form the active site-blocking disulfide bond that can form in the human protein under oxidative conditions.
- **Improve Purification:** RNasin® Plus is expressed by *E. coli* as a soluble protein, allowing easy purification by a combination of ion exchange and hydrophobic interaction chromatography. No direct affinity chromatography required. The new process yields a >90% pure protein with no *E. coli* RNase carryover.
- **Use with RT-PCR Systems:** RNasin® Plus has proven compatible with the Access and AccessQuick™ RT-PCR Systems, M-MLV Reverse Transcriptase, ImProm-II™ Reverse Transcription System and the GoScript™ Reverse Transcription System. Also proven compatible with TaqMan®-based RT-PCR Systems.
- **Protect During RNA Template Denaturation:** Heating mixtures of RNasin® Plus RNase Inhibitor and RNase does not lead to reactivation of the RNase at temperatures even as high as 70°C for 15 minutes. Many RT-PCR protocols call for RNA template denaturation (e.g., 65–70°C for 5–10 minutes) in the presence of the RT primers prior to full RT reaction assembly for maximum sensitivity. You can now include RNasin® Plus at this step.
- **Protect During Higher Temperature RT Reactions:** Add RNasin® Plus RNase Inhibitor during RT reaction assembly and take the reaction to temperatures above 50°C with enzymes like the ImProm-II™ and AMV Reverse Transcriptases. RNases that may be present will not be reactivated at the higher temperature.

Storage Conditions: Store at –20°C.

Subcloning Tools and Vectors

Subcloning Tools Bundle

Product	Size	Cat.#
Subcloning Tools Bundle	1 each	M1060
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Speed your subcloning with these easy-to-use tools. Purchase the Subcloning Tools Bundle, and get LigaFast™ Rapid DNA Ligation System, TSAP Thermosensitive Alkaline Phosphatase, BenchTop 100bp DNA Ladder, Wizard® SV Gel and PCR Clean-Up System and PureYield™ Plasmid Miniprep System for one low price.

Features:

- **LigaFast™ Rapid DNA Ligation System:** Rapid room temperature ligations of vectors and inserts in as little as 5 minutes. Transform competent bacteria immediately following the reaction.
- **TSAP Thermosensitive Alkaline Phosphatase:** Use rapid protocol (included) to digest and dephosphorylate at the same time or use in a standard application. Heat-kill the enzyme after the reaction in 15 minutes. Active in common restriction enzyme buffers with no zinc requirement.
- **BenchTop 100bp DNA Ladder:** Ready-to-load marker for agarose gel electrophoresis. Use when gel purifying either vector or insert.
- **Wizard® SV Gel and PCR Clean-Up System:** Rapid gel purification of fragments for 100bp to 10kb. Great for removing enzymes from DNA as well. High-capacity and low elution volume.
- **PureYield™ Plasmid Miniprep System:** Rapid 10-minute miniprep. Prepare your vector for subcloning or use to screen for recombinants.

Storage Conditions: Store the LigaFast™ Rapid DNA Ligation System (M8221) and TSAP Thermosensitive Alkaline Phosphatase (M9910) at –20°C. Store the BenchTop 100bp DNA Ladder at 22–25°C; storage at –20°C can enhance the shelf life of this product. Store the Wizard® SV Gel and PCR Clean-Up System (A9281) and PureYield™ Plasmid Miniprep System (A1223) at 22–25°C.

Flexi® Cloning System

Product	Size	Cat.#
Flexi® System, Entry/Transfer	5 entry and 20 transfer reactions	C8640
Flexi® System, Transfer	100 transfer reactions	C8820
Carboxy Flexi® System, Transfer	50 transfer reactions	C9320
HaloTag® Cloning Starter System	1 each	G6050
Available Separately		
10X Flexi® Enzyme Blend (SgfI & PmeI)	25 µl	R1851
	100 µl	R1852
Carboxy Flexi® Enzyme Blend (SgfI & EcoICRI)	50 µl	R1901
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The Flexi® Vector System is a directional cloning method for protein-coding sequences. It is based on two rare-cutting restriction enzymes, SgfI and PmeI, and provides a rapid, efficient and high-fidelity way to transfer protein-coding regions without the need to resequence.

All Flexi® Vectors carry the lethal barnase gene, which is replaced by the DNA fragment of interest and acts as a positive selection for the successful ligation of the insert.

Unlike site-specific recombination vector systems, the Flexi® Vector Systems do not require appending multiple amino acids to the amino or carboxy termini of the protein of interest. In addition, the systems do not require an archival entry vector, and most applications allow direct entry into the vector suited to the experimental design.

C-terminal Flexi® Vectors allow expression of C-terminal-tagged proteins. While these vectors can act as acceptors of protein-coding regions flanked by SgfI and PmeI, they lack a PmeI site and contain a different blunt-ended site, EcoICRI. This joined sequence cannot be removed from the C-terminal Flexi® Vectors and transferred to other Flexi® Vectors.

Features:

- **Versatility:** You can choose between a variety of initial applications (e.g., bacterial protein, mammalian or cell-free protein expression) and then transfer to others as required.
- **Time Savings:** Efficient transfer allows direct use of recombinant clones, minimizing time wasted screening background colonies.
- **Enhanced Productivity:** Adaptable to high-throughput formats for large screening projects.
- **Easy Access:** No licensing fees or complicated transfer restrictions.

Storage Conditions: Cat.# C8640 is comprised of Cat.# C8641 and A9280. Store Cat.# C8641 at –20°C; store Cat.# A9280 at room temperature. Store Cat.# C8820 and C9320 at –20°C. Store enzyme blends at –20°C.

Available in the Helix® on-site stocking system

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Untagged Flexi® Mammalian Expression Vectors

Product	Size	Cat.#
pF4A CMV Flexi® Vector	20 µg	C8481
pF4K CMV Flexi® Vector	20 µg	C8491
pF5A CMV-neo Flexi® Vector	20 µg	C9401
pF5K CMV-neo Flexi® Vector	20 µg	C9411
pF9A CMV *hRluc*-neo Flexi® Vector	20 µg	C9361

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: These vectors are designed specifically for high-level expression of proteins in mammalian cells from the CMV promoter with or without a selectable marker. The pFN9A Vector provides *Renilla* luciferase, which may be used as a transfection control. The pFN9A Vector was designed to complement pGL4 firefly luciferase vectors when exogenous proteins (e.g., a receptor of transcription factor) must be expressed for reporter assays. All inserts may be confirmed by cell-free expression with the TnT® T7 Quick System (Cat.# L1170).

Note: Flexi® Vectors contain the lethal barnase gene to reduce background colonies without inserts during the subcloning procedure. Using the Flexi® Vector Cloning System replaces the barnase gene with your insert. These vectors, as purchased, cannot be cultured in normal laboratory strains of *E. coli* without an insert.

Features:

- **Versatility:** You can choose between a variety of initial applications (e.g., bacterial protein, mammalian, or cell-free protein expression) and then transfer to others as required.
- **Time Savings:** Efficient transfer allows direct use of recombinant clones, minimizing time wasted screening background colonies.
- **Enhanced Productivity:** Adaptable to high-throughput formats for large screening projects.
- **Easy Access:** No licensing fees or complicated transfer restrictions.

Storage Conditions: Store vectors at –20°C.

HaloTag® Vectors for *E. coli* and Cell-Free Protein Expression

Product	Size	Cat.#
pH6HTN His_6HaloTag® T7 Vector	20 µg	G7971
pH6HTC His_6HaloTag® T7 Vector	20 µg	G8031
pF1A T7 Flexi® Vector	20 µg	C8441
pF1K T7 Flexi® Vector	20 µg	C8451
pFN18A HaloTag® T7 Flexi® Vector	20 µg	G2751
pFN18K HaloTag® T7 Flexi® Vector	20 µg	G2681
pFN19A HaloTag® T7 SP6 Flexi® Vector	20 µg	G1891
pFN19K HaloTag® T7 SP6 Flexi® Vector	20 µg	G1841
pFC20A HaloTag® T7 SP6 Flexi® Vector	20 µg	G1681
pFC20K HaloTag® T7 SP6 Flexi® Vector	20 µg	G1691
pFN29A His_6HaloTag® T7 Flexi® Vector	20 µg	G8261
pFN29K His_6HaloTag® T7 Flexi® Vector	20 µg	G8331
pFC30A His_6HaloTag® T7 Flexi® Vector	20 µg	G8321
pFC30K His_6HaloTag® T7 Flexi® Vector	20 µg	G8381

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: These vectors are used for inducible expression of HaloTag® fusion proteins in *E. coli* and cell-free systems using the T7 RNA polymerase promoter. Expression levels depend highly on the nature of the protein, but in general the N-terminal HaloTag® fusion protein (e.g., pFN18A/K, Cat.# G2751, G2681) can increase expression level, enhance refolding and boost solubility of the expressed protein. HaloTag® vectors are supplied in two formats: as multiple cloning site (MCS) vectors for traditional cloning and as Flexi® System vectors.

Multiple Cloning Site (MCS) Vectors

pH6HTN His_6HaloTag® T7 Vector (Cat.# G7971) is designed for protein expression with an N-terminal His_6-HaloTag® dual tag in *E. coli* and T7 cell-free expression systems.

pH6HTC His_6HaloTag® T7 Vector (Cat.# G8031) is designed for protein expression with a C-terminal His_6-HaloTag® dual tag in *E. coli* and T7 cell-free expression systems.

Flexi® System Vectors

pF1A/K T7 Flexi® Vectors (Cat.# C8441, C8451) are designed for untagged protein expression.

pFN18A/K HaloTag® T7 Flexi® Vectors (Cat.# G2751, G2681) are designed for protein expression with an N-terminal HaloTag® in *E. coli* and T7 cell-free expression systems.

pFN19A/K HaloTag® T7 SP6 Flexi® Vectors (Cat.# G1891, G1841) are designed for protein expression with an N-terminal HaloTag® in T7 and SP6 cell-free expression systems. These vectors are optimized for cell-free expression systems.

pFC20A/K HaloTag® T7 SP6 Flexi® Vectors (Cat.# G1681, G1691) are designed for protein expression with a C-terminal HaloTag® in *E. coli* and SP6 cell-free expression systems. These vectors are optimized for cell-free expression systems.

pFN29A/K His_6HaloTag® T7 Flexi® Vectors (Cat.# G8261, G8331) are designed for protein expression with an N-terminal His_6-HaloTag® dual tag in *E. coli* T7 cell-free expression systems.

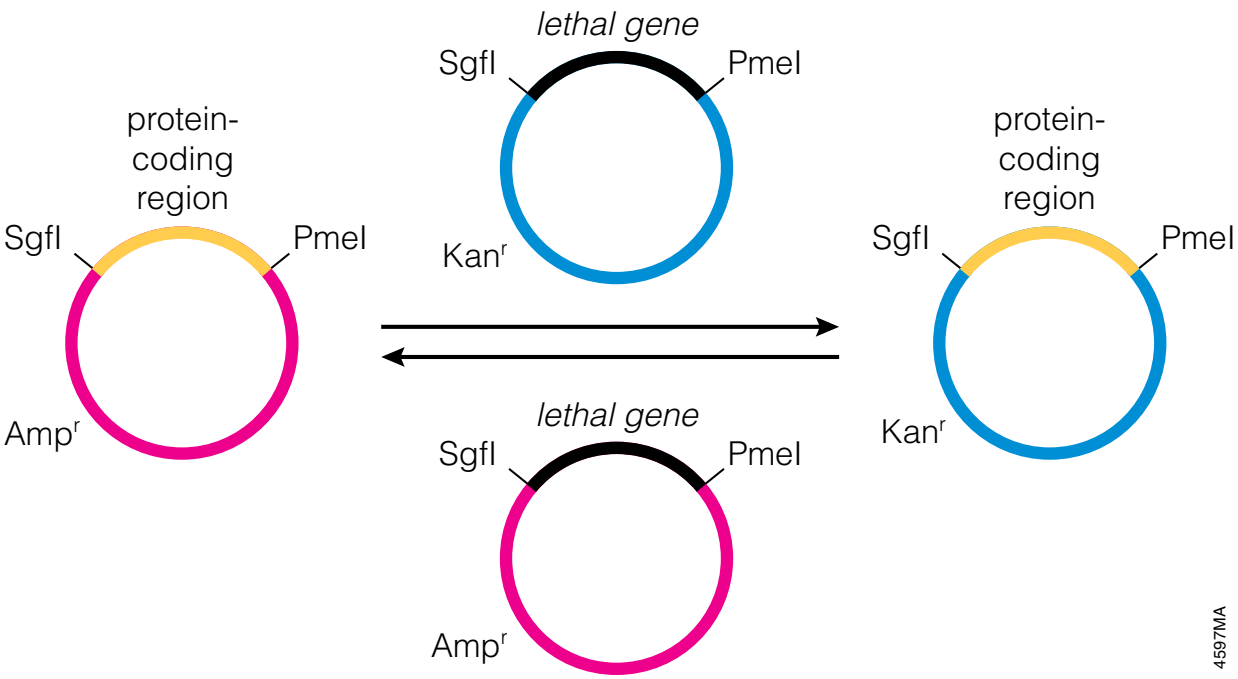
pFC30A/K His_6HaloTag® T7 Flexi® Vectors (Cat.# G8321, G8381) are designed for protein expression with a C-terminal His_6-HaloTag® dual tag in *E. coli* T7 cell-free expression systems.

Note: Flexi® Vectors contain the lethal barnase gene to reduce background colonies without inserts during the subcloning procedure. Using the Flexi® Vector Cloning System replaces the barnase gene with your insert. These vectors, as purchased, cannot be cultured in normal laboratory strains of *E. coli* without an insert.

Features:

- **Choice of Systems:** Choose between traditional (MCS) and Flexi® cloning to get the benefits of HaloTag® technology.
- **Dual Tag:** Couple the protein solubility and labeling benefits of HaloTag® technology with the reusability and the throughput of Ni-affinity technology.
- **Versatile Cloning:** Choose from a variety of expression systems and fusion tag orientations and then transfer to others as required (for Flexi® system).
- **Time Savings:** Barnase insert (Flexi® system) decreases the number of background colonies, allowing efficient transfer of genetic constructs.

Storage Conditions: Store vectors at –20°C.



Transferring coding regions in the Flexi® Vector System.

HQ and GST Tag Flexi® Vectors for *E. coli* and Cell-Free Protein Expression

Product	Size	Cat.#
pFN2A (GST) Flexi® Vector	20 µg	C8461
pFN2K (GST) Flexi® Vector	20 µg	C8471
pFN6A (HQ) Flexi® Vector	20 µg	C8511
pFN6K (HQ) Flexi® Vector	20 µg	C8521
pFC7A (HQ) Flexi® Vector	20 µg	C8531
pFC7K (HQ) Flexi® Vector	20 µg	C8541
pF1A T7 Flexi® Vector	20 µg	C8441
pF1K T7 Flexi® Vector	20 µg	C8451
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: These vectors are used for inducible expression of HQ- and GST-tagged fusion proteins in *E. coli* and cell-free systems using the T7 RNA polymerase promoter. The HQ tag and polyhistidine tag (His) are comparable in their affinity for Ni ions and will bind to all His-binding surfaces and resins. In certain cases the HQ-tagged proteins can be eluted from the affinity columns at lower concentrations of imidazole—a property useful for some downstream applications such as enzymatic reactions. As with His tag, proteins can be expressed from bacterial, insect and mammalian systems and purified under either native or denaturing conditions. The GST tag has been successfully used to boost tagged protein solubility during *E. coli* expression.

pFN2A/K (GST) Flexi® Vectors are designed for protein expression with an N-terminal GST tag in *E. coli* and T7 cell-free expression systems.

pFN6A/K (HQ) Flexi® Vectors are designed for protein expression with an N-terminal HQ tag in *E. coli* and T7 cell-free expression systems.

pFC7A/K (HQ) Flexi® Vectors are designed for protein expression with an C-terminal HQ in *E. coli* and T7 cell-free expression systems.

pF1A/K T7 Flexi® Vectors (Cat.# C8441, C8451) are designed for inducible expression of native untagged protein.

Note: Flexi® Vectors contain the lethal barnase gene to reduce background colonies without inserts during the subcloning procedure. Using the Flexi® Vector Cloning System replaces the barnase gene with your insert. These vectors, as purchased, cannot be cultured in normal laboratory strains of *E. coli* without an insert.

Features:

- **Easy to Implement and Reliable:** Choose between traditional His-affinity and GST-affinity resins for standard protein purification and prokaryotic expression applications.
- **Cost-Effective:** Technology for reusable and cost-efficient Ni (His-affinity) and gluthathione (GST-affinity) resins.
- **Versatile Cloning:** Choose from a variety of expression systems and fusion tag orientations and then transfer to others as required (for Flexi® system).
- **Time Savings:** Barnase insert (Flexi® system) decreases the number of background colonies, allowing efficient transfer of genetic constructs.

Storage Conditions: Store vectors at –20°C.

pALTER®-MAX Vector

Product	Size	Cat.#
pALTER®-MAX Vector	20 µg	Q5761
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The pALTER®-MAX Vector is a 5,534bp plasmid. It contains the human cytomegalovirus (CMV) immediate-early enhancer/promoter region for strong, constitutive expression of cloned DNA inserts in a variety of mammalian cell types. The pALTER®-MAX Vector as supplied is chloramphenicol-resistant and ampicillin-sensitive.

Storage Conditions: Store vector DNA at –20°C.

pGEM®-3Z Vector

Product	Size	Cat.#
pGEM®-3Z Vector	20 µg	P2151
For Research Use Only. Not for Use in Diagnostic Procedures.		

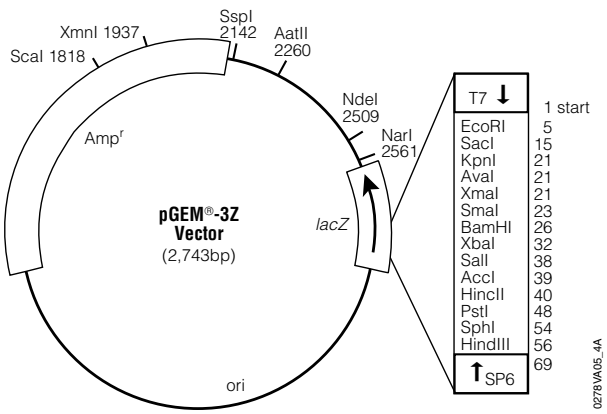
Description: The pGEM®-3Z Vector is intended for use as a standard cloning vector, as well as for the highly efficient synthesis of RNA in vitro. The vector carries the *lacZ* α-peptide and the multiple cloning region arrangement from pUC18 allowing selection of recombinants by blue/white screening. In addition, the vector contains both the SP6 and T7 RNA polymerase promoters flanking the multiple cloning region.

The pGEM®-3Z and pGEM®-4Z Vectors are essentially identical except for the orientation of the SP6 and T7 promoters.

Features:

- **Blue/White Screening:** Allows the easy identification of recombinant clones.
- **Versatile:** This vector can be used for standard cloning and in vitro transcription from SP6 and T7 RNA polymerase promoters flanking the multiple cloning region.
- **Convenient:** Multiple cloning site provides a selection of restriction sites for cloning.

Storage Conditions: Store vector at –20°C.



pGEM®-3Zf(+/–) Vectors

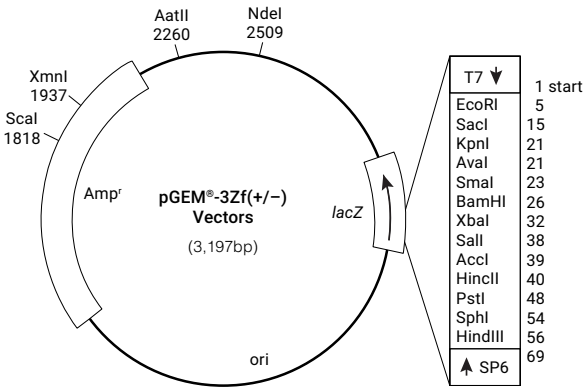
Product	Size	Cat.#
pGEM®-3Zf(+) Vector	20 µg	P2271
pGEM®-3Zf(–) Vector	20 µg	P2261
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The pGEM®-3Zf(+/–) Vectors contain T7 and SP6 RNA polymerase promoters flanking a multiple cloning region within the α-peptide coding region of β-galactosidase. Insertional inactivation of the α-peptide allows recombinant clones to be identified directly by color screening on indicator plates when using appropriate *E. coli* strains (e.g., JM109). The multiple cloning region contains unique restriction sites for EcoRI, SacI, KpnI, AvaI, SmaI, BamHI, XbaI, SalI, AccI, HincII, PstI, SphI and HindIII.
The pGEM®-3Zf(+/–) Vectors can be used as standard cloning vectors and as templates for in vitro transcription.

Features:

- **Blue/White Screening:** Allows the easy identification of recombinant clones.
- **Convenient:** Multiple cloning site provides a selection of restriction sites for cloning.

Storage Conditions: Store vector at –20°C and bacterial strain at –70°C.



Available in the Helix® on-site stocking system

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pGEM®-4Z Vector

Product	Size	Cat.#
pGEM®-4Z Vector	20 µg	P2161

For Research Use Only. Not for Use in Diagnostic Procedures.

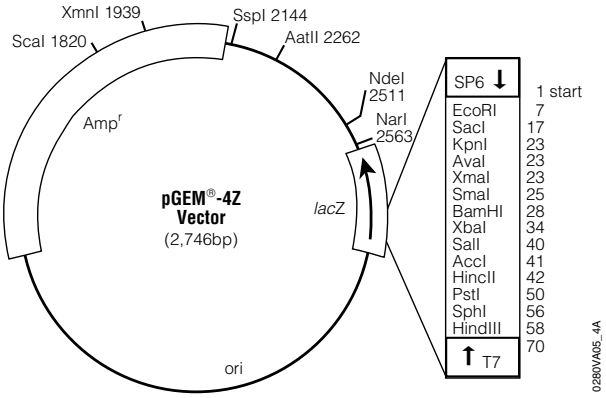
Description: The pGEM®-4Z Vector is intended for use as a standard cloning vector, as well as for the highly efficient synthesis of RNA in vitro. The vector carries the *lacZ* α-peptide and the multiple cloning region arrangement from pUC18 allowing selection of recombinants by blue/white screening. In addition, the vector contains both the SP6 and T7 RNA polymerase promoters flanking the multiple cloning region.

The pGEM®-3Z and pGEM®-4Z Vectors are essentially identical except for the orientation of the SP6 and T7 promoters.

Features:

- **Blue/White Screening:** Allows the easy identification of recombinant clones.
- **Versatile:** This vector can be used for standard cloning and in vitro transcription from SP6 and T7 RNA polymerase promoters flanking the multiple cloning region.
- **Convenient:** Multiple cloning site provides a selection of restriction sites for cloning.

Storage Conditions: Store vector at –20°C and bacterial strain at –70°C.



pGEM®-5Zf(+) Vector

Product	Size	Cat.#
pGEM®-5Zf(+) Vector	20 µg	P2241

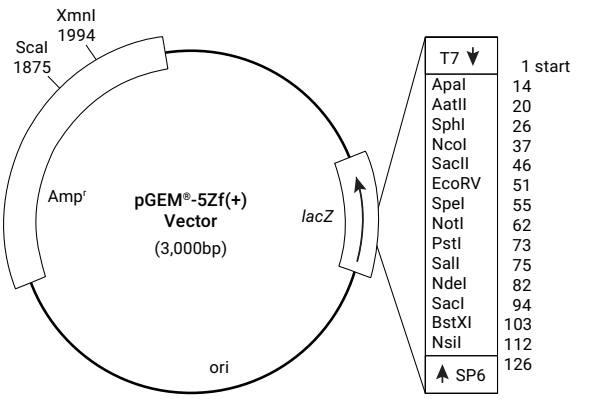
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The pGEM®-5Zf(+) Vector serves as a standard cloning vector and as a template for in vitro transcription. The vector contains T7 and SP6 RNA polymerase promoters flanking a multiple cloning region within the α-peptide coding region of β-galactosidase. Insertional inactivation of the α-peptide allows recombinant clones to be identified directly by color screening on indicator plates when using appropriate *E. coli* strains (e.g., JM109). The multiple cloning region contains unique restriction sites for ApaI, AatII, SphI, NcoI, SacII, EcoRV, SpeI, NotI, PstI, SalI, NdeI, SacI, BstXI and NsiI.

Features:

- **Blue/White Screening:** Allows the easy identification of recombinant clones.
- **Convenient:** Multiple cloning site provides a selection of restriction sites for cloning.

Storage Conditions: Store vector at –20°C and bacterial strain at –70°C.



pGEM®-7Zf(+/–) Vectors

Product	Size	Cat.#
pGEM®-7Zf(+) Vector	20 µg	P2251
pGEM®-7Zf(–) Vector	20 µg	P2371

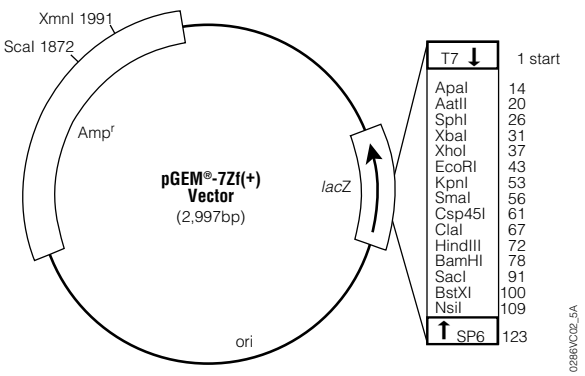
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The pGEM®-7Zf(+\–) Vectors serve as standard cloning vectors and as templates for in vitro transcription. These plasmids contain SP6 and T7 RNA polymerase promoters flanking a region of multiple cloning sites within the α-peptide coding region of β-galactosidase. Insertional inactivation of the α-peptide allows recombinant clones to be identified directly by color screening on indicator plates when using appropriate *E. coli* strains (e.g., JM109). The multiple cloning region is unique and includes restriction sites for ApaI, AatII, SphI, XbaI, XhoI, EcoRI, KpnI, SmaI, ClaI, HindIII, BamHI, SacI, BstXI and NsiI.

Features:

- **Blue/White Screening:** Allows the easy identification of recombinant clones.
- **Versatile:** This standard cloning vector allows in vitro transcription from SP6 and T7 RNA polymerase promoters flanking the multiple cloning region.
- **Convenient:** Multiple cloning site provides a selection of restriction sites for cloning.

Storage Conditions: Store vector at –20°C and bacterial strain at –70°C.



pGEM®-9Zf(–) Vector

Product	Size	Cat.#
pGEM®-9Zf(–) Vector	20 µg	P2391

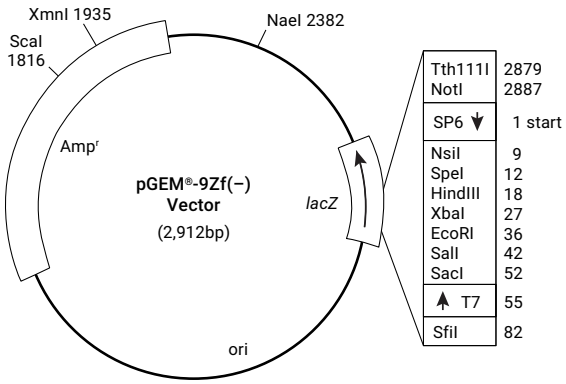
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The pGEM®-9Zf(–) Vector is a recombinant plasmid designed to provide a versatile range of cloning strategies and efficient synthesis of RNA in vitro. The plasmid contains T7 and SP6 RNA polymerase promoters flanking a multiple cloning region within the α-peptide coding region of β-galactosidase. Insertional inactivation of the α-peptide allows recombinant clones to be identified directly by color screening on indicator plates when using appropriate *E. coli* strains (e.g., JM109). The multiple cloning region is unique and includes restriction sites for NsiI, SpeI, HindIII, XbaI, EcoRI, SalI and SacI.

Features:

- **Excisable SP6/T7 Insert:** This vector allows the excision of an insert containing the SP6 and T7 RNA polymerase promoters.
- **Blue/White Screening:** Allows the easy identification of recombinant clones.
- **Versatile:** This vector can be used for standard cloning and for in vitro transcription from SP6 and T7 RNA polymerase promoters flanking the multiple cloning region.
- **Convenient:** Multiple cloning site provides a selection of restriction sites for cloning.

Storage Conditions: Store vector at –20°C and bacterial strain at –70°C.



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pGEM®-11Zf(+) Vector

Product	Size	Cat.#
pGEM®-11Zf(+) Vector	20 µg	P2411

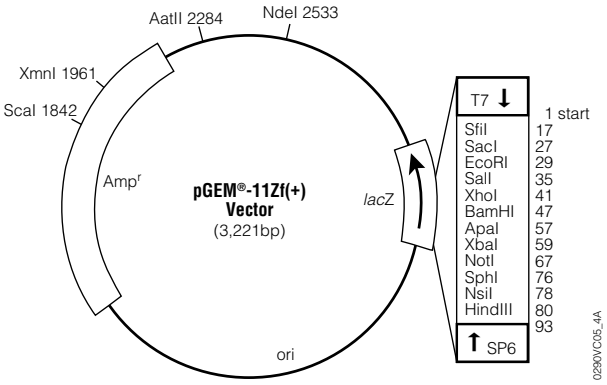
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The pGEM®-11Zf(+) Vector can be used as a standard cloning vector and as a template for in vitro transcription. This plasmid contains T7 and SP6 RNA polymerase promoters flanking a multiple cloning region within the α-peptide coding region of β-galactosidase. Insertional inactivation of the α-peptide allows recombinant clones to be identified directly by color screening on indicator plates when using appropriate *E. coli* strains (e.g., JM109). The multiple cloning region contains unique restriction sites for SfiI, SacI, EcoRI, SalI, XhoI, BamHI, ApaI, XbaI, NotI, SphI, NsiI and HindIII.

Features:

- **Blue/White Screening:** Allows the easy identification of recombinant clones.
- **Versatile:** This vector can be used for standard cloning and in vitro transcription from SP6 and T7 RNA polymerase promoters flanking the multiple cloning region.
- **Convenient:** Multiple cloning site provides a selection of restriction sites for cloning.

Storage Conditions: Store vector at –20°C and bacterial strain at –70°C.



pSP64 Poly(A) Vector

Product	Size	Cat.#
pSP64 Poly(A) Vector	20 µg	P1241

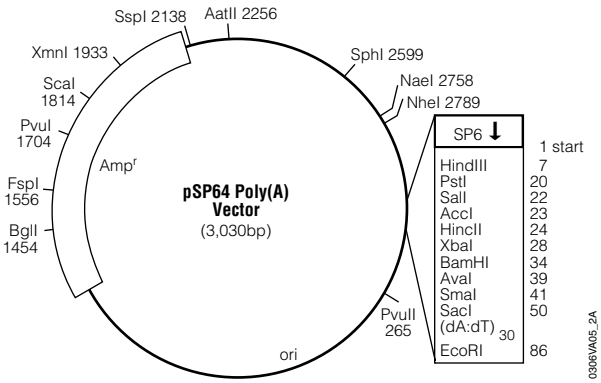
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The pSP64 Poly(A) Vector can be used as a standard cloning vector and for in vitro transcription from the SP6 promoter. The pSP64 Poly(A) Vector also can be used to generate poly(A)+ transcripts in vitro. The vector has a stretch of 30 dA:dT residues inserted between the SacI and EcoRI sites. Therefore, when foreign DNA is cloned into any polylinker site other than EcoRI (HindIII, PstI, SalI, AccI, HincII, XbaI, BamHI, AvaI, SmaI or SacI), linearization of the recombinant plasmid with EcoRI allows the use of SP6 RNA polymerase in vitro to prepare RNA copies of the inserted sequences that contain a synthetic 3′ "poly(A)" tail of 30 residues.

Features:

- **In Vitro Transcription:** The SP6 promoter is next to the polylinker.
- **Generates Poly(A)+ Transcripts In Vitro:** A stretch of 30 dA:dT residues are inserted between the SacI and EcoRI sites in the polylinker. Poly(A) tails can stabilize RNAs and lead to greater yields for in vitro translation reactions.
- **Convenient:** Multiple cloning region provides a selection of restriction sites for cloning.

Storage Conditions: Store vector at –20°C.



pSP72 Vector

Product	Size	Cat.#
pSP72 Vector	20 µg	P2191

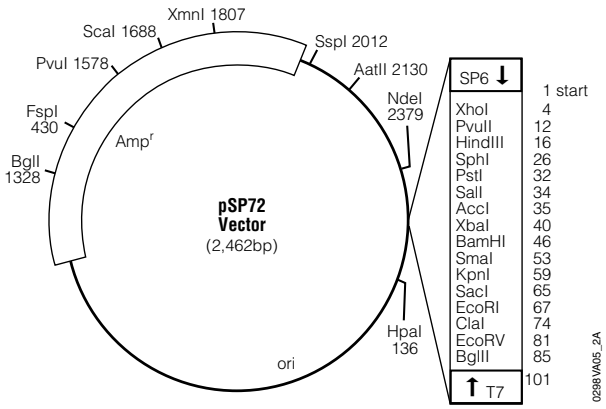
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The pSP72 Vector can be used as a standard cloning vector and also can be used for transcription of RNA in vitro. The pSP72 Vector contains the SP6 and T7 RNA polymerase promoters flanking a unique multiple cloning region, which includes restriction sites for XhoI, PvuII, HindIII, SphI, PstI, SalI, AccI, XbaI, BamHI, SmaI, KpnI, SacI, EcoRI, ClaI, EcoRV and BglII. The pSP72 and pSP73 Vectors are essentially identical except for the orientation of the multiple cloning site region.

Features:

- **Versatile:** This vector can be used for standard cloning and in vitro transcription from SP6 and T7 RNA polymerase promoters flanking the multiple cloning region.
- **Convenient:** Multiple cloning site provides a selection of restriction sites for cloning.

Storage Conditions: Store vector at –20°C.



pSP73 Vector

Product	Size	Cat.#
pSP73 Vector	20 µg	P2221

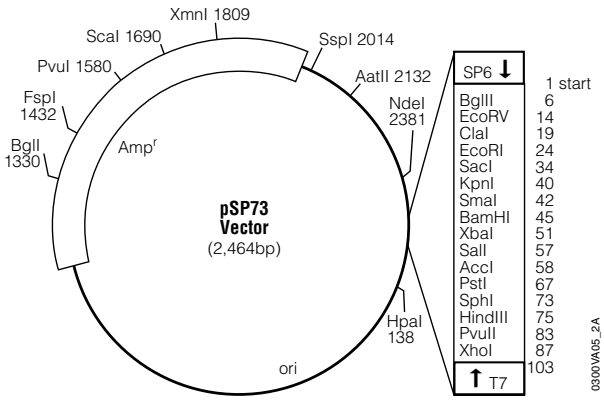
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The pSP73 Vector offers a wide range of restriction sites, providing greater versatility in cloning and transcription of RNA in vitro. The pSP73 Vector contains the SP6 and T7 RNA polymerase promoters and a unique multiple cloning region, which includes restriction sites for BglII, EcoRV, ClaI, EcoRI, SacI, KpnI, SmaI, BamHI, XbaI, SalI, AccI, PstI, SphI, HindIII, PvuII and XhoI. The pSP72 and pSP73 Vectors are essentially identical except for the orientation of the multiple cloning region.

Features:

- **Versatile:** This vector can be used for standard cloning and in vitro transcription from SP6 and T7 RNA polymerase promoters flanking the multiple cloning region.
- **Convenient:** Multiple cloning site provides a selection of restriction sites for cloning.

Storage Conditions: Store vector at –20°C.



Available in the Helix® on-site stocking system

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Bacterial Strains and Competent Cells

Bacterial Strains

Product	Size	Cat.#
Bacterial Strain ES1301 *mut*S, Glycerol Stock (noncompetent)	200 µl	Q6131
Bacterial Strain BMH 71-18 *mut*S, Glycerol Stock (noncompetent)	500 µl	Q6321
Bacterial Strain JM109, Glycerol Stock	500 µl	P9751
Bacterial Strain JM109(DE3), Glycerol Stock	500 µl	P9801
Bacterial Strain LE392, Glycerol Stock	500 µl	K9981
Bacterial Strain NM522, Glycerol Stock	500 µl	P2301
For Research Use Only. Not for Use in Diagnostic Procedures.		

Competent Cells

Product	Size	Cat.#
Single Step (KRX) Competent Cells	20 × 50 µl	L3002
L-Rhamnose Monohydrate	10 g	L5701
	50 g	L5702
Single-Use JM109 Competent Cells, >10^8cfu/µg	1 ml	L2005
JM109 Competent Cells, >10^7cfu/µg	1 ml	L1001
JM109 Competent Cells, >10^8cfu/µg	1 ml	L2001
Single-Use HB101 Competent Cells, >10^8cfu/µg	1 ml	L2015
HB101 Competent Cells, >10^8cfu/µg	1 ml	L2011
Single-Use BL21(DE3)pLysS Competent Cells	1 ml	L1195
BL21(DE3)pLysS Competent Cells, >10^6cfu/µg	1 ml	L1191
For Research Use Only. Not for Use in Diagnostic Procedures.		

Promega

9

Nucleic Acid Extraction

Nucleic Acid Extraction

Helix

Products tagged with the Helix® icon are available for distribution through our convenient on-site stocking program in a freezer, refrigerated unit or an ambient cabinet.

For more information visit: **www.promega.com/helix**

Helix

Available in the Helix® on-site stocking system

DNA Extraction

Molecular Biology Lab Guide

Product	Size	Cat.#
Molecular Biology Lab Guide	1 each	GEN1978
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The Molecular Biology Lab Guide (6" × 9", 132 pages) is a resource designed for the scientist just embarking on their career. The Guide focuses on fundamental technologies and techniques to provide an overview of the work you might encounter in a molecular biology research setting. Through the combination of conversational writing, helpful ProTips, and real-life examples, the Molecular Biology Lab Guide is like having your own personal tutor to explain basic concepts that can help you navigate through the challenges that come with molecular biology research.

Features:

- Spiral-bound for lay-flat reference
- QR codes for easy video viewing
- Pullout guides/references
- Compact size ideal for daily use
- Dedicated space for taking notes

Maxwell® FSC DNA IQ™ Casework Kit

Product	Size	Cat.#
Maxwell® FSC DNA IQ™ Casework Kit	48 preps	AS1550
Not For Medical Diagnostic Use.		

Description: The Maxwell® FSC DNA IQ™ Casework Kit is designed for optimal DNA extraction from forensic casework samples. These samples may include blood stains, semen stains, hairs, cigarette butts, tissue samples and trace or "touch" DNA samples regularly encountered in forensic DNA analysis. The kit contains the same trusted reagents as the DNA IQ™ System in a convenient, prefilled cartridge format and is optimized to provide a final DNA extract in a pure, concentrated format.

The Maxwell® FSC DNA IQ™ Casework Kit uses a plastic cartridge and newly designed plunger that allow DNA elution in a final volume of no more than 50µl. DNA IQ™ Lysis Buffer, Resin and Wash Buffer are included in the prefilled cartridge, and DNA IQ™ Elution Buffer is included in the kit to ensure proper storage of the DNA. The Maxwell® FSC DNA IQ™ Casework Kit is compatible with the Maxwell® FSC Instrument (Chapter 13), which includes a surface tablet and easy, intuitive interface.

Features:

- Use for blood stains, semen stains, hairs, cigarette butts, tissue samples and trace or "touch" DNA samples.
- Easy-to-use spin baskets circumvent the need to transfer swabs helping minimize cross-contamination.
- Uses the same reagents as the DNA IQ™ Systems in an automated format.

Storage Conditions: Store at 15–30°C.

Forensic Grade Consumables

Product	Size	Cat.#
Elution Tubes, 0.5ml	50/pack	AS7201
FSC Plungers	50/pack	AS7151
LEV Plungers	50/pack	AS1651
Nuclease-Free Water	150ml	P1196
DNA IQ™ Spin Baskets	50/pack	V1225
ClickFit Microtube, 1.5ml	100/pack	V4745
AS7201, AS7151, AS1651, V1225, V4745 Not For Medical Diagnostic Use. P1196 For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Promega forensic products are manufactured in alignment with the ISO 18385 standard. This standard ensures minimal risk of human DNA contamination for products used to collect, store and analyze biological materials for forensic purposes. Use with both Maxwell® FSC DNA IQ™ Casework Kit and DNA IQ™ Casework Pro Kit for Maxwell® 16. Learn more at: **www.promega.com/products/genetic-identity/forensic-grade-faq/**

Storage Conditions: Store all Forensic Grade Consumables at 15–30°C. Nuclease-Free Water can be stored at any temperature below 30°C.

Maxwell® HT DNA FFPE Isolation System

Product	Size	Cat.#
Maxwell® HT DNA FFPE Isolation System	4 × 96 preps	A6372
Available Separately	**Size**	**Cat.#**
Buffer A (BWA)	125 ml	A6371
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The Maxwell® HT DNA FFPE Isolation System provides a simple and reliable method for high-throughput, rapid isolation of genomic DNA from FFPE (formalin-fixed, paraffin-embedded) tissue samples. The purified DNA can be used directly in a variety of downstream applications, including PCR and next-generation sequencing.

The Maxwell® HT DNA FFPE Isolation System purifies nucleic acid using paramagnetic particles, which provide a mobile solid phase to optimize sample capture, washing and purification of gDNA. The use of paramagnetic particles for DNA capture eliminates the need for centrifugation or vacuum manifolds, making the system suitable for full automation. In addition, the system does not require an organic solvent, making it safe and convenient.

Features:

- Robust, precipitation-free protocol, no chance of lost pellets
- High yields of pure DNA from FFPE samples without using xylene or other hazardous chemicals
- Ideal for use in downstream applications including qPCR and next-generation sequencing (NGS)

Storage Conditions: Store at room temperature (15–30°C). Do not refrigerate or freeze any of the reagents.

Maxwell® RSC PureFood Pathogen Kit

Product	Size	Cat.#
Maxwell® RSC PureFood Pathogen Kit	48 preps	AS1660
Not For Medical Diagnostic Use.		

Description: If you need to make quick decisions about potential food spoilage and contamination, the Maxwell® RSC PureFood Pathogen Kit offers a simple extraction protocol to obtain high-quality bacterial DNA from a variety of food sample types. The kit works with inhibiting sample types, and can lyse both $Gram^+$ or $Gram^-$ bacteria, eliminating laborious sample preparation steps like enzymatic pretreatment.

The extracted DNA is ready for advanced downstream molecular analyses including NGS, serotyping, and identification of spoilage organisms. The high-performance Maxwell® chemistries coupled with the trusted benchtop Maxwell® RSC instrument allow you to purify bacterial DNA from food samples in as little as 40 minutes, giving you the ability to get answers more quickly.

Features:

- Isolate DNA from raw or processed food samples
- Works well with inhibiting sample types
- No need for labor-intensive sample processing

Storage Conditions: Store at 15–30°C.

Maxwell® RSC FFPE Plus DNA Kit

Product	Size	Cat.#
Maxwell® RSC FFPE Plus DNA Kit	48 preps	AS1720
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The Maxwell® RSC FFPE Plus DNA Kit is used with the Maxwell® RSC Instruments to extract DNA from formalin-fixed, paraffin-embedded tissue samples. The kits are designed for optimal purification of DNA from one to ten 5µm thin sections of FFPE tissue samples, maximizing yield and eliminating the need to concentrate the extract prior to amplification.

The protocol provides overnight proteinase K digestion of samples prior to DNA purification. After proteinase K digestion, tissue lysates are placed directly into the FFPE Kit cartridges, and amplification-ready genomic DNA is obtained in approximately 30 minutes. The Maxwell® RSC Instrument processes 1–16 cartridges per run. The Maxwell® RSC 48 Instrument processes 1–48 samples per run. The kit does not use hazardous xylene, providing a much safer method than other FFPE purification products. Quality testing demonstrates virtually no PCR inhibitors in purified samples.

Features:

- Purifies DNA from 1–48 (5µm) FFPE samples
- Faster digestion option without organic solvents
- Sufficient yield for downstream amplification

Storage Conditions: Store at 15–30°C.

Casework Consumables

Product	Size	Cat.#
CW Spin Baskets	50/pack	AS8101
CW Microfuge Tubes, 1.5ml	50/pack	AS8201
Not For Medical Diagnostic Use.		

Description: The CW Spin Baskets and CW Microfuge Tubes, 1.5ml, are ethylene-oxide-treated and enable preprocessing of solid samples without the need to transfer swabs, simplifying the process and reducing the chance of cross-contamination. Use with both Maxwell® FSC DNA IQ™ Casework Kit and DNA IQ™ Casework Pro Kit for Maxwell® 16.

Storage Conditions: Store all consumables at 15–30°C.

Available in the Helix® on-site stocking system

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ReliaPrep™ Large Volume HT gDNA Isolation System

Product	Size	Cat.#
ReliaPrep™ Large Volume HT gDNA Isolation System	1 each	A2751
HSM 2.0 Instrument	1 each	A2715
Alkaline Protease (APA)	130 ml	A1721
Cell Lysis Buffer (CLD)	1,400 ml	A1731
	160 ml	A1732
Binding Buffer (BBA)	1,600 ml	A1741
	200 ml	A1742
ReliaPrep™ Resin	115 ml	A1752
	5.5 ml	A1753
Prepared Wash Buffer (WBC)	3,500 ml	A2681
Proteinase K (PK) Solution	23 ml	A5051
Nuclease-Free Water	500 ml	P1197
Available Separately	**Size**	**Conc.**	**Cat.#**
RNase A Solution	5 ml	4 mg/ml	A7974
20X TE Buffer (pH 7.5)	25 ml		A2651
Tissue Lysis Buffer (TLA)	500 ml		A5091
Nuclease-Free Water	1,000 ml		P1199
Integrated Reagent Caps	4 /pk		A2701
HSM 2.0 Instrument Cover	1 each		A2712
HSM 2.0 Tube Rack	1 each		A2713
HSM 2.0 Tube Rack Stand	1 each		A2714
HSM 2.0 Instrument 1-Year Service Agreement	1 each		SA1330
ReliaPrep™ LV 32 HSM Standard Service Agreement	1 each		SA3070
Bottle for 50% Ethanol	1 each		A2691

A2751, A7974, A2651, A2715, A1721, A5091, A1731, A1732, P1199, A1741, A1742, A2701, A1752, A1753, A2712, A2681, A2713, A2714, A5051, P1197, SA3070, A2691 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ReliaPrep™ Large Volume HT gDNA Isolation System isolates genomic DNA (gDNA) from 1–10ml of blood in a scalable format. The chemistry eliminates tedious centrifugation steps as well as the use of hazardous chemicals, which are inherent in precipitation-based chemistries. Each reagent kit provides enough reagents to process up to 96 × 10ml whole blood samples. The system has been automated on robotic liquid-handling workstations, allowing walkaway purification of genomic DNA from 1–10ml of whole blood, regardless of sample storage or shipping conditions. For low-throughput isolation of gDNA from up to 32 samples at one time, the HSM 2.0 can be used in a manual mode, where the user performs the pipetting functions. The HSM has software that controls the instrument and directs the user through the purification protocol.

Features:

- **Decrease Hands-On Time:** Automation reduces operator time spent on instrument setup and takedown by allowing walkaway operation for large numbers of samples at one time.
- **Remove Protocol Bottlenecks:** Heater Shaker Magnet eliminates the need to move samples on the robot deck, reducing instrument failures; precipitation-free chemistry dramatically reduces purification failures.
- **Achieve Peace of Mind:** Automated liquid level sensing with operator notification allows recovery of samples in case of error.
- **Isolate Pure DNA from All Samples:** Purification chemistry is equally effective at recovering DNA from pristine as well as challenged (hemolysed or frozen) samples.
- **Save a Day or Two of Processing:** Samples are eluted in buffer, ready for use in downstream assays or archiving, eliminating resuspension of pelleted DNA, which can take 24–48 hours.
- **Reduce Waste:** Chemistry is automatically scaled for each sample and plastic use is conserved, reducing liquid and solid waste during sample runs.

Storage Conditions: Store at 15–30°C.

ReliaPrep™ Blood gDNA Miniprep System

Product	Size	Cat.#
ReliaPrep™ Blood gDNA Miniprep System	100 preps	A5081
	250 preps	A5082

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ReliaPrep™ Blood gDNA Miniprep System provides a complete, ready-to-use method for purification of gDNA from up to 200µl of blood or body fluid, consistently isolating pure, intact gDNA without the use of alcohol washes or precipitations. Genomic DNA can be prepared from fresh or frozen blood in less than 40 minutes with expected DNA yields of 4–10µg, depending on the white blood cell count of the blood sample.

Features:

- **Easy to Use:** Reagents are supplied "ready to go"; no additions required.
- **Save Time:** Eluted DNA obtained in 30 minutes or less.
- **No Ethanol:** Eliminates alcohol inhibition and carryover.
- **Pure gDNA:** Improved A_{260}/A_{230} ratios vs. the leading competitor.
- **Peace of Mind:** Consistent results from run to run and between users even with hemolyzed samples.
- **Concentrated DNA:** Good recovery and purity in as little as 50µl elution.

Storage Conditions: Store at 15–30°C.

ReliaPrep™ gDNA Tissue Miniprep System

Product	Size	Cat.#
ReliaPrep™ gDNA Tissue Miniprep System	100 preps	A2051
	250 preps	A2052

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ReliaPrep™ gDNA Tissue Miniprep System provides a complete, ready-to-use method for purification of gDNA from up to 25mg of tissue, a buccal (cheek) swab, or a 1cm mouse tail snip, obtaining intact gDNA without the use of ethanol washes or precipitations.

Features:

- **Easy to Use:** Reagents are supplied "ready-to-use"—no additions required.
- **Save Time:** Eluted DNA obtained in 30 minutes or less (hands-on time).
- **No Ethanol:** Eliminates alcohol inhibition and carryover.
- **Pure gDNA:** Improved A_{260}/A_{230} ratios vs. the leading competitor.
- **Peace of Mind:** Consistent results from run to run and between users.
- **Concentrated DNA:** Good recovery and purity in as little as 50µl elution.

Storage Conditions: Store at 15–30°C.

Maxwell® HT 96 gDNA Blood Isolation System

Product	Size		Cat.#
Maxwell® HT 96 gDNA Blood Isolation System	1 × 96 preps		A2670
	4 × 96 preps		A2671
Available Separately	**Size**	**Conc.**	**Cat.#**
Heat Block Adapter	1 each		A2661
RNase A Solution	5 ml	4 mg/ml	A7974
25mM Tris-HCl (pH 8.0)	60 ml		A2641
10mM EDTA (pH 8.0)	10 ml		A2631
20X TE Buffer (pH 7.5)	25 ml		A2651
Wash Buffer (WBA)	500 ml		A1761

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Maxwell® HT 96 gDNA Blood Isolation provides a simple and reliable method for the rapid isolation of gDNA in a multiwell format. gDNA may be purified from blood and Oragene®•Discover sample collection devices. The purified gDNA can be used directly in PCR assays, microarrays and next-generation sequencing applications. The use of paramagnetic particles for DNA capture eliminates the need for centrifugation or vacuum manifolds, making the system suitable for full automation. In addition, the system does not require an organic solvent, making it safe and convenient. DNA yields of up to 12µg are expected from input blood volumes of 350µl, depending on the WBC count of the sample. Saliva samples can have variable amounts of gDNA, and up to 18µg or more of DNA may be recovered from a 700µl Oragene® collection device sample.

Features:

- **Improve Productivity:** Walkaway automation of genomic DNA extraction.
- **Eliminate Sample Rework:** Robust, precipitation-free protocol, no chance of "lost pellets".
- **Simplify Workflow:** High yields of pure DNA from pristine and challenged or hemolysed samples.
- **Reduce Time to Results:** Pure gDNA ready for demanding applications; samples in solution; no resuspension required.

Storage Conditions: Store all components at 15–30°C.

ReliaPrep™ FFPE gDNA Miniprep System

Product	Size	Cat.#
ReliaPrep™ FFPE gDNA Miniprep System	10 reactions	A2351
	100 reactions	A2352
Available Separately		
Microtubes, 1.5ml	1,000 /bag	V1231
ClickFit Microtube, 1.5ml	1,000 /pack	V4741

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ReliaPrep™ FFPE gDNA Miniprep System provides a complete, all-inclusive method for purifying quality genomic DNA from formalin-fixed paraffin-embedded tissue without using hazardous solvents or overnight digestion. Genomic DNA can be isolated from FFPE tissue in approximately two and one-half hours with minimal hands-on time.

Features:

- **Isolate Quality, Intact gDNA:** Optimized lysis and binding conditions reverse modifications introduced by the fixation process, resulting in intact, amplifiable gDNA.
- **Safely Deparaffinize Your Sample:** Deparaffinization step occurs without harsh organic solvents.
- **Save Time:** Purify gDNA from FFPE tissue in less than two and one-half hours with minimal hands-on time. No overnight digestion required.
- **Easy to Use:** Minimal preparation time; simply add ethanol and go!

Storage Conditions: Store at room temperature.

Wizard® Genomic DNA Purification Kit

Product	Size		Cat.#
Wizard® Genomic DNA Purification Kit	100 isolations × 300 µl		A1120
	500 isolations × 300 µl		A1125
	100 isolations × 10 ml		A1620
Available Separately	**Size**	**Conc.**	**Cat.#**
Cell Lysis Solution (Genomic Purification)	1 liter		A7933
Nuclei Lysis Solution	50 ml		A7941
	1 liter		A7943
Protein Precipitation Solution	25 ml		A7951
	350 ml		A7953
DNA Rehydration Solution	50 ml		A7963
RNase A Solution	1 ml	4 mg/ml	A7973
Proteinase K	100 mg		V3021

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Wizard® Genomic DNA Purification Kit provides a simple, solution-based method for isolation of DNA from white blood cells, tissue culture cells, animal tissue, plant tissue, yeast and Gram-positive and Gram-negative bacteria. DNA purified with this system is suitable for a variety of applications, including amplification, digestion with restriction endonucleases and membrane hybridizations (e.g., Southern and dot/slot blots).

Features:

- **Improved Productivity:** Rapidly isolate genomic DNA from blood, tissue culture, animal and plant cells, bacteria and yeast in approximately 60 minutes.
- **Scalability:** Reagent volumes can be adjusted to correspond to the amount of material to be processed.
- **Flexibility:** Genomic DNA purified from a variety of sample types is suitable for a variety of applications.
- **Your Choice of Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at 22–25°C.

Available in the Helix® on-site stocking system

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Wizard® SV Genomic DNA Purification System

Product	Size		Cat.#
Wizard® SV Genomic DNA Purification System	50 preps		A2360
	250 preps		A2361
Available Separately	**Size**	**Conc.**	**Cat.#**
Wizard® SV Lysis Buffer	50 ml		Z3052
Column Wash Solution (CWA)	185 ml		A1311
Nuclei Lysis Solution	50 ml		A7941
EDTA, 0.5M (pH 8.0), Molecular Biology Grade	100 ml		V4231
RNase A Solution	1 ml	4 mg/ml	A7973
Microtubes, 1.5ml	1,000 /bag		V1231
ClickFit Microtube, 1.5ml	1,000 /pack		V4741

A2360, Z3052, A2361, A7941, V4231, A7973, V1231, V4741 For Research Use Only. Not for Use in Diagnostic Procedures. A1311 For Laboratory Use.

Description: The Wizard® SV Genomic DNA Purification System provides a fast, simple, membrane-based technique for preparing genomic DNA from cultured cells and tissue, including mouse tails. Genomic DNA can be purified from cultured cells in about 20 minutes. Isolation from tissue or mouse tails requires an overnight digestion with Proteinase K (Cat.# V3021). Amplifiable genomic DNA can be isolated from up to 5×10^6 cells, 20mg of tissue or up to 1.2cm of a mouse tail tip without a centrifugation clearing step.

The Wizard® SV Genomic DNA Purification System can be used in either a microcentrifuge (spin) or vacuum protocol. Up to 20 samples can be processed at once in the vacuum format with the Vac-Man® Laboratory Vacuum Manifold (Cat.# A7231) and the Vacuum Adapters (Cat.# A1331).

Features:

- **Improved Productivity:** Obtain genomic DNA approximately 20 minutes after lysis.
- **High Yield:** Purify 20–30µg of DNA per prep from 1.2cm mouse tail.
- **Format Choice:** Perform purification by either spin or vacuum formats.

Storage Conditions: Store at 22–25°C.

Wizard® SV 96 Genomic DNA Purification System

Product	Size		Cat.#
Wizard® SV 96 Genomic DNA Purification System	1 × 96 preps		A2370
	4 × 96 preps		A2371
Available Separately	**Size**	**Conc.**	**Cat.#**
Wizard® SV Lysis Buffer	50 ml		Z3052
Column Wash Solution (CWA)	185 ml		A1311
Nuclei Lysis Solution	50 ml		A7941
EDTA, 0.5M (pH 8.0), Molecular Biology Grade	100 ml		V4231
RNase A Solution	1 ml	4 mg/ml	A7973
Wizard® SV 96 Binding Plates	10 pack		A2271

A2370, Z3052, A2371, A7941, V4231, A7973, A2271 For Research Use Only. Not for Use in Diagnostic Procedures. A1311 For Laboratory Use.

Description: The Wizard® SV 96 Genomic DNA Purification System provides a high-throughput, membrane-based technique for consistent preparation of genomic DNA from cultured cells and tissue, including mouse tails. Amplifiable genomic DNA can be isolated from up to 5×10^6 cells, 20mg of tissue or up to 1.2cm of a mouse tail tip without a centrifugation clearing step.

With the Wizard® SV Genomic DNA purification system, genomic DNA is purified from cell lysates using 96-well vacuum filtration. Washing the bound DNA requires no disassembly of the manifold, and filtrate waste products are delivered directly to a vacuum trap, eliminating the need to empty waste collection trays.

The Wizard® SV Genomic DNA Purification System is designed for use either in a manual format or with Beckman Coulter or PerkinElmer automated instruments.

Features:

- **Improve Productivity:** Obtain genomic DNA from mouse tails in 45–60 minutes, genomic DNA from cultured cells in 30 minutes. No spins required.
- **Achieve High Yield:** Purify 20–30µg of DNA per prep from 1.2cm of mouse tail.
- **Gain Confidence in Applications:** Purified DNA ready for amplification.
- **Automate This Assay:** Validated automated methods available at: **www.promega.com/automethods/**
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at 22–25°C.

MagneSil® ONE, Fixed Yield Blood Genomic System

Product	Size	Cat.#
MagneSil® ONE, Fixed Yield Blood Genomic System	1 × 96 preps	MD1370
Collection Plates (4-pack)	1 each	A9161
Available Separately		
Lysis Buffer, Blood	160 ml	MD1392
Alcohol Wash, Blood	120 ml	MD1412
Anti-Foam Reagent	300 µl	MD1431
MagneSil® PMPs-Fixed Yield	25 ml	MD1451
Elution Buffer, Blood	45 ml	MD1421

MD1370, MD1392, A9161, MD1451, MD1421 For Research Use Only. Not for Use in Diagnostic Procedures. MD1412, MD1431 For Laboratory Use.

Description: The MagneSil® ONE, Fixed Yield Blood Genomic System purifies 1µg of DNA (+/– 50%) from 60µl of anti-coagulated whole blood. Purification of a "fixed yield" of DNA eliminates the need to quantitate and normalize concentrations postpurification. The highly pure DNA isolated is suitable for use in PCR, multiplex PCR and SNP genotyping applications.

Walkaway automation is available on the Beckman Coulter Biomek® FX in a 96-well format. Process 96 samples in about 1 hour with no hands-on time following robot setup.

Features:

- **Improve Productivity:** Use walkaway automation to extract genomic DNA and eliminate DNA quantitation prior to PCR.
- **Achieve Consistent Results:** Obtain 1µg (fixed yield) of highly pure DNA from 60µl of blood.
- **Automate This Assay:** Validated automated methods available at: **www.promega.com/automethods/**
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at 20–25°C.

MagneSil® Blood Genomic, Max Yield System

Product	Size	Cat.#
MagneSil® Blood Genomic, Max Yield System	1 × 96 preps	MD1360
Available Separately		
Anti-Foam Reagent	300 µl	MD1431
MagneSil® Paramagnetic Particles	25 ml	MD1441
Salt Wash, Blood	90 ml	MD1401
Alcohol Wash, Blood	70 ml	MD1411
Elution Buffer, Blood	45 ml	MD1421

MD1360, MD1401, MD1411, MD1421 For Research Use Only. Not for Use in Diagnostic Procedures. MD1431, MD1441 For Laboratory Use.

Description: The MagneSil® Blood Genomic, Max Yield System provides automated high-throughput DNA purification on the Beckman Coulter Biomek® FX using MagneSil® Paramagnetic Particle technology. DNA from 96 samples of anti-coagulated human whole blood is purified in about 1 1/2 hours with no hands-on time once the robot protocol is initiated. Studies on DNA recovery and purity and PCR results show no cross-contamination between samples in adjacent wells. Purified DNA is qualified for single-locus "simple PCR" as well as more demanding applications such as multiplex PCR (e.g., PowerPlex® 16 System [Cat.# DC6531], Y Chromosome Deletion Detection System [Cat.# MD1531]) and SNP genotyping.

Features:

- **Improve Productivity:** Walkaway automation of genomic DNA extraction.
- **Achieve Maximum Yield:** The average yield of 96 purified samples from normal healthy adults is ≥4µg.
- **Automate This Assay:** Validated automated methods available at: **www.promega.com/automethods/**
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at 22–25°C.

Available in the Helix® on-site stocking system

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MagneSil® Genomic, Large Volume System

Product	Size	Cat.#
MagneSil® Genomic, Large Volume System	48 preps	A4082
Available Separately		
eLysis Buffer, Large Volume System	1 L	A4091

A4082 For Research Use Only. Not for Use in Diagnostic Procedures. A4091 For Laboratory Use.

Description: The MagneSil® Genomic, Large Volume System, is designed for scalable, automated genomic DNA isolation from large-volume samples, eliminating laborious centrifugation steps and the use of hazardous organic solvents. The system has been automated on the Tecan Freedom EVO® liquid handler, providing walkaway purification of genomic DNA from a variety of starting materials, including 1–10ml whole blood samples, regardless of sample storage or shipping conditions. The instrument uses only the amount of reagents required to process each sample, maximizing efficiency and value per prep.

The MagneSil® Genomic, Large Volume System, uses a robust noncentrifugation-based automated method to purify genomic DNA from fresh, frozen or mishandled blood and other samples with similar yields and quality. The system bypasses many of the challenges of traditional centrifugation-based methods by lysing the entire whole blood sample and then directly capturing total genomic DNA from the lysed sample using MagneSil® Paramagnetic Particles (PMPs). The genomic DNA bound to the MagneSil® PMPs is washed to remove contaminants such as heme and cellular proteins, then eluted into an aqueous solution ready for use in downstream applications. There is no need for tedious and lengthy DNA rehydration. The purified genomic DNA is suitable for a variety of downstream applications such as single and multiplex PCR, restriction digestion and real-time PCR.

Features:

- **Improve Productivity:** Walkaway automation from blood-collection tube to application-ready DNA.
- **Rely on an Integrated Solution:** One reagent system and automated method provide yield and purity from any sample type (fresh or frozen blood, samples of unknown quality and mixed sample populations).
- **Enjoy Smart Scalability:** Scale sample size from 1–10ml of blood, batch size from 1–96 samples and reagent usage from input sample volume.
- **Achieve Turnkey Automation:** Optimized protocol available for the Tecan Freedom EVO® instrument. This and other validated automated methods are available at: **www.promega.com/automethods/**

Storage Conditions: Store at 22–25°C.

Fixed-Tissue Genomic DNA Purification

Product	Size	Cat.#
MagneSil® Genomic, Fixed Tissue System	100 samples	MD1490

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The MagneSil® Genomic, Fixed Tissue System provides a fast, simple technique to prepare genomic DNA from formalin-fixed, paraffin-embedded tissue. After an overnight Proteinase K digestion, genomic DNA can be manually purified from formalin-fixed, paraffin-embedded thin tissue sections in less than an hour. Amplifiable genomic DNA can be isolated from 10µm thin sections without centrifugation of the lysate prior to purification. Up to 12 samples can be processed in the manual format using the MagneSphere® Technology Magnetic Separation Stand (twelve-position) (Cat.# Z5342).

Features:

- **Purify High-Quality DNA:** The composition of the wash buffers and protocol have been optimized to yield genomic DNA that is largely free of small DNAs, a potent inhibitor of PCR amplification.
- **Rely on Performance-Tested Amplification Results:** Amplify targets in multiplex PCR and targets as large as 450–1,800bp.

Storage Conditions: MD1490 consists of two separate items shipped at different temperatures. MD1170 (part 1 of 2 for MD1490—Processing Module) contains Proteinase K, DTT and Incubation Buffer, which are shipped on dry ice. Store MD1170 at –20°C. MD1180 (part 2 of 2 for MD1490—Purification Module) contains Lysis Buffer, 2X Wash Buffer, Resin and Elution Buffer, which are shipped at room temperature, 22–25°C. Store MD1180 at room temperature, 22–25°C.

ReadyAmp™ Genomic DNA Purification System

Product	Size	Cat.#
ReadyAmp™ Genomic DNA Purification System	100 reactions	A7710

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ReadyAmp™ Genomic DNA Purification System yields single-stranded DNA (ssDNA) from whole blood or blood stains that may be used directly in amplification reactions without further manipulation. The process takes less than one hour and requires no organic extractions or ethanol precipitations.

Features:

- **Simple and Effective:** ReadyAmp™ resin removes PCR inhibitors.
- **Convenient:** Isolated DNA can be used directly in PCR amplifications.

Storage Conditions: Store at 22–25°C.

MagneSil® KF, Genomic System

Product	Size	Cat.#
MagneSil® KF, Genomic System	200 preps	MD1460
Available Separately		
MagneSil® KF, Paramagnetic Particles	40 ml	MD1471
Lysis Buffer, KF	160 ml	MD1521

MD1460 For Research Use Only. Not for Use in Diagnostic Procedures. MD1471, MD1521 For Laboratory Use.

Description: The MagneSil® KF, Genomic System is designed for easy, walkaway, low- to moderate-throughput automated genomic DNA purification from blood and other samples. For blood samples, lysis occurs concurrently with DNA binding to MagneSil® Paramagnetic Particles. After washes to remove heme and proteins, purified genomic DNA is ready for PCR and other downstream applications. The system is designed to purify 2–6µg of genomic DNA from 200µl of anti-coagulated liquid blood.

The MagneSil® KF, Genomic System is designed to run on the Thermo Electron KingFisher® mL instrument, which automates DNA purification in a flexible 1- to 15-sample batch, 25-minute walkaway format. The compact size of the KingFisher® mL allows it to be used on the benchtop or in a laminar flow hood. Please contact Thermo Electron for more information on the KingFisher® mL instrument.

Features:

- **Improve Productivity:** Use automated 25-minute optimized, walkaway protocol with no training. Eliminate laborious manual methods.
- **Rely On a Performance-Tested System:** Purified DNA is tested in PCR, multiplex PCR, fluorescent STR analysis and SNP genotyping applications.
- **Conserve Valuable Lab Space:** The small footprint (30 × 30 × 30cm) of the Thermo Electron KingFisher® mL instrument delivers automated throughput that makes sense for smaller labs. No external PC required.
- **Automate This Assay:** Validated automated methods available at: **www.promega.com/automethods/**

Storage Conditions: Store at 22–25°C. Do not freeze the MagneSil® KF Paramagnetic Particles.

MagaZorb® DNA Mini-Prep Kit

Product	Size		Cat.#
MagaZorb® DNA Mini-Prep Kit	200 preps		MB1004
	800 preps		MB1008
Available Separately	**Size**	**Conc.**	**Cat.#**
Proteinase K (PK) Solution	16 ml	20 mg/ml	MC5008
20-Position Microcentrifuge Tube Magnetic Separator	1.5 ml		CD4002

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The MagaZorb® DNA Kit provides an easy, fast and cost-effective technique for isolating PCR-quality DNA. Using one simple protocol, a high yield of purified DNA can be isolated from a wide variety of sources including whole blood (fresh or frozen, citrate-, heparin- or EDTA-treated), buffy coat, leukocytes, milk, seminal fluid, dried blood spots, cultured cells, tissue (fresh, frozen or formalin-fixed paraffin-embedded), saliva, urine, stool, hair, buccal swabs and vaginal swabs.

The 20-Position Microcentrifuge Tube Magnetic Separator (Cat.# CD4002) utilizes a microcentrifuge tube rack that can be removed from the high-strength magnets for wash steps or incubation in a water bath. The rack is designed to hold the microcentrifuge tubes so that they will not fall out even when turned upside down, and it can withstand temperatures of up to 80°C for convenient manipulation of sample tubes. Please note that the magnets in the 20-Position Microcentrifuge Tube Magnetic Separator are designed specifically for use with the MagaZorb® DNA Kit; separation may not work with other particles.

Features:

- **Convenient:** Contains all needed reagents so that no reagent preparation is required.
- **Efficient:** Eliminates centrifugation, vacuum filtration or column separation, increasing sample throughput and improving reproducibility.
- **Safe:** Does not require organic solvents, eliminating the need for special storage or waste disposal.

Storage Conditions: Store at 22–25°C.

Wizard® Magnetic 96 DNA Plant System

Product	Size	Cat.#
Wizard® Magnetic 96 DNA Plant System	2 × 96 preps	FF3760
	4 × 96 preps	FF3761
Available Separately		
Wash Buffer, Plant	40 ml	A3811

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Wizard® Magnetic 96 DNA Plant System is designed for manual or automated 96-well, high-throughput purification of DNA from plant leaf and seed tissue. The system has been validated with corn and tomato leaf, as well as with canola and sunflower seeds. The DNA purified from these samples can be used in PCR as well as more demanding applications such as RAPD analysis. Unlike column-based systems, the binding of nucleic acids to magnetic particles can occur in solution, enhancing contact with the wash buffer and increasing nucleic acid purity.

Protocols are available for Beckman Coulter instruments.

Features:

- **Improved Productivity:** Manual and automated 96-well protocols cut purification time compared to CTAB extraction.
- **Ease of Handling:** Eliminates organic extractions, multiple centrifugations and cumbersome filter plates.
- **Confidence in Applications Performance:** Validated for both leaf and seed tissue by PCR and RAPD analysis.
- **Automation:** Validated automated methods available at: **www.promega.com/automethods/**
- **Your Choice of Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at 22–25°C.

Wizard® Magnetic DNA Purification System for Food

Product	Size	Cat.#
Wizard® Magnetic DNA Purification System for Food	200 preps	FF3750
	400 preps	FF3751
Available Separately		
Lysis Buffer A, Food	100 ml	A8191
Lysis Buffer B, Food	100 ml	Z3191
Precipitation Solution, Food	150 ml	Z3201

A8191, Z3191, Z3201 For Research Use Only. Not for Use in Diagnostic Procedures. FF3750, FF3751 For in vitro use only.

Description: The Wizard® Magnetic DNA Purification System for Food is designed for purification of DNA from a variety of food samples including corn seeds, cornmeal, soybeans, soy flour and soy milk. Processed food, such as corn chips, chocolate and chocolate-containing foods, lecithin and vegetable oils may also be used with the suggested protocol variations. The DNA purified from these samples can be used in PCR-based testing for genetically modified organism (GMO) DNA sequences.

Features:

- **Improved Productivity:** Obtain results in one-third the time of current methods.
- **Ease of Handling:** Requires minimal centrifugation and eliminates organic extractions.
- **Versatility and Robustness:** Validated with a broad variety of foodstuffs, including difficult samples such as lecithin and vegetable oils.

Storage Conditions: Store at 22–25°C.

Maxwell® 16 System DNA Purification Kits

Product	Size	Cat.#
Low Elution Volume (LEV)		
Maxwell® 16 LEV Blood DNA Kit	48 preps	AS1290
Maxwell® 16 FFPE Plus LEV DNA Purification Kit	48 preps	AS1135
Maxwell® 16 Cell LEV DNA Purification Kit	48 preps	AS1140
Maxwell® 16 Buccal Swab LEV DNA Purification Kit	48 preps	AS1295
Maxwell® 16 FFPE Tissue LEV DNA Purification Kit	48 preps	AS1130
Maxwell® 16 LEV Plant DNA Kit	48 preps	AS1420
Standard Elution Volume (SEV)		
Maxwell® 16 Blood DNA Purification Kit	48 preps	AS1010
Maxwell® 16 Blood DNA Purification System (IVD)	48 preps	AS1015
Maxwell® 16 Cell DNA Purification Kit	48 preps	AS1020
Maxwell® 16 Tissue DNA Purification Kit	48 preps	AS1030
Maxwell® 16 Mouse Tail DNA Purification Kit	48 preps	AS1120
Available Separately		
Maxwell® 16 Flexi Method Firmware	1 each	AS6411
LEV Plungers	50 /pk	AS6101
LEV Elution Tubes	50 /pk	AS6201
Microtubes, 1.5ml	1,000 /bag	V1231
ClickFit Microtube, 1.5ml	1,000 /pack	V4741
Elution Buffer, Blood	45 ml	MD1421
SEV Plungers	50 /pk	AS5201
SEV Elution Tubes	50 /pk	AS5101

AS1290, AS1135, AS1140, AS1295, AS1130, AS1010, AS1020, AS1030 For Laboratory Use. AS1420, AS1120, AS6101, AS6201, V1231, V4741, MD1421, AS5201, AS5101, AS6411 For Research Use Only. Not for Use in Diagnostic Procedures. AS1015 For In Vitro Diagnostic Use. This product is only available in certain countries.

Description: The Maxwell® 16 Genomic DNA Purification Kits are designed for use with the Maxwell® 16 Instrument. DNA purification kits are provided with corresponding optimized automated methods. You get consistent yield and purity from easy-to-use automation.

For genomic DNA purification, the Maxwell® 16 System is the only system that makes purification from tissue as easy as purification from blood or cells. The action of the plunger grinds solid tissue samples directly in the lysis buffer in the prefilled reagent cartridges. Integrated grinding replaces time- and labor-intensive use of lytic enzymes such as proteinase K or manual tissue grinding prior to purification.

Kits for optimized DNA purification from eukaryotic tissue, blood, cells, mouse tail and FFPE tissue sections are available. Protocols for a variety of new samples are being developed. The Maxwell® 16 DNA Purification Kits are General Purpose Medical Devices (GPR) in the USA. For up-to-date information visit: **www.promega.com/maxwell16/**

Features:

- **Achieve High Yield:** Efficient processing and higher sample capacity than comparable systems.
- **Enjoy Amazing Speed:** Hands-free purification of genomic DNA in 18–30 minutes.
- **Get More Time:** Easily process tissues and cells.

Maxwell® RSC System DNA Purification Kits

Product	Size	Cat.#
Maxwell® RSC Blood DNA Kit	48 preps	AS1400
Maxwell® RSC Whole Blood DNA Kit	48 preps	AS1520
Maxwell® RSC DNA FFPE Kit	48 preps	AS1450
Maxwell® RSC Cell DNA Purification Kit	48 preps	AS1370
Maxwell® RSC ccfDNA Plasma Kit	48 preps	AS1480
Maxwell® RSC Buccal Swab DNA Kit	48 preps	AS1640
Maxwell® RSC Stabilized Saliva DNA Kit	48 preps	AS1630
Maxwell® RSC Tissue DNA Kit	48 preps	AS1610
Maxwell® RSC Cultured Cells DNA Kit	48 preps	AS1620
Maxwell® RSC Buffy Coat DNA Kit	48 preps	AS1540
Maxwell® RSC Plant DNA Kit	48 preps	AS1490
Maxwell® RSC PureFood GMO and Authentication Kit	48 preps	AS1600
Available Separately		
Maxwell® RSC Instrument	1 each	AS4500
RSC/CSC Deck Tray	1 each	SP6019
Maxwell® Instrument Bar Code Reader	1 each	AS3200
Microtubes, 1.5ml	1,000 /bag	V1231
ClickFit Microtube, 1.5ml	1,000 /pack	V4741
CTAB Buffer	100 ml	MC1411

AS1600, MC1411 Not For Medical Diagnostic Use. All others For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Maxwell® Rapid Sample Concentrator (RSC) Instrument is an automated nucleic acid purification system that processes up to 16 samples in a single run. The instrument is used with the prefilled reagent cartridges provided in the Maxwell® RSC Purification Kits to purify DNA or RNA from a wide range of sample types. The intuitive graphical user interface makes the instrument easy to use, and the integrated Quantus™ Fluorometer lets you collect purification and quantification data in one report.

These kits can be used for automated DNA purification with the Maxwell® RSC Instrument:

Maxwell® RSC Blood DNA Kit

- Extracts DNA from whole blood or buffy coat samples in 30–40 minutes.
- Processes up to 400µl of whole blood.
- Yields up to 15µg of gDNA, depending on white blood cell count.

Maxwell® RSC Whole Blood DNA Kit

- Extracts DNA from 50–500µl of whole blood in less than 40 minutes.
- Simple, walkaway protocol with no preprocessing.
- Compatible with blood stored in EDTA, heparin and citrate anticoagulants.

Maxwell® RSC DNA FFPE Kit

- Extracts amplifiable DNA from FFPE tissue sections.
- Eliminates the use of hazardous organic solvents.
- Purified DNA performs better in downstream applications.

Maxwell® RSC Cell DNA Purification Kit

- Extracts DNA from samples containing less than 10,000 cells.
- Compatible with low-cell-number samples such as amniotic fluid, cerebral spinal fluid and cell supernatants.
- Cells are collected and processed in up to 400µl volumes, and extraction is complete in about 30 minutes.

Maxwell® RSC ccfDNA Plasma Kit

- Simple, walkaway protocol with no preprocessing.
- Provides high yields of pure and amplifiable ccfDNA.
- Scalable protocol, process ccfDNA from 0.2–1ml of plasma.

Maxwell® RSC Buccal Swab DNA Kit

- Optimized reagents for buccal swab extraction.
- Decreased hands-on time with simple protocol.
- Consistent results with sufficient DNA for HLA assays.

Maxwell® RSC Stabilized Saliva DNA Kit

- Simple protocol with optimized reagents.
- Consistent DNA yields.
- DNA ready to use in downstream assays such as HLA typing.

Maxwell® RSC Tissue DNA Kit

- Extracts DNA from up to 50mg of mammalian tissue.
- Purifies high yields of amplifiable DNA.
- Automated protocol improves efficiency.

Maxwell® RSC Cultured Cells DNA Kit

- Extracts DNA from up to 5×10^6 mammalian tissue culture cells and 2×10^9 bacterial cells.
- Simple, walkaway protocol requires no sample preprocessing.
- Purified DNA is ready for analysis in about 45 minutes.

Maxwell® RSC Buffy Coat DNA Kit

- Purifies high yields of DNA from 50–250µl of buffy coat samples in about 50 minutes.
- Simple walkaway protocol with no preprocessing.
- Compatible with blood stored in EDTA, heparin and citrate anticoagulants.

Maxwell® RSC Plant DNA Kit

- Extracts DNA from a range of plant tissues, including soybean, corn and *Arabidopsis*.
- Consistent purification, no organic extractions and minimal preprocessing.
- Purified DNA is ready to use in downstream applications including amplification assays.

Maxwell® RSC PureFood GMO and Authentication Kit

- Purifies high-quality DNA from a range of food and feed samples.
- Results in highly concentrated DNA that is ready to use in downstream assays.
- Simple, five-step protocol saves time and eliminates organic extraction steps.

Available in the Helix® on-site stocking system

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Plasmid Purification

PureYield™ Plasmid Miniprep System

Product	Size	Cat.#
PureYield™ Plasmid Miniprep System	100 preps	A1223
	250 preps	A1222

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The PureYield™ Plasmid Miniprep System is designed to rapidly isolate highly pure plasmid DNA. The system provides a rapid method for purification of up to 15µg of plasmid DNA from 600µl to 3ml of bacteria culture. Plasmid DNA can be purified in as little as 10 minutes. The PureYield™ Plasmid Miniprep System incorporates a unique Endotoxin Removal Wash designed to remove substantial amounts of protein, RNA and endotoxin contaminants from purified plasmid DNA. Removal of contaminants improves the robustness of sensitive applications such as eukaryotic transfection, in vitro transcription and coupled in vitro transcription/translation (e.g., TNT® Quick Coupled Transcription/Translation System). Purification is achieved without isopropanol precipitation of purified plasmid DNA or extensive centrifugation, providing rapid purification from a single method.

The system has been designed for use with centrifugation or vacuum (e.g., the Vac-Man® Laboratory Vacuum Manifold).

Features:

- **Improved Productivity:** Rapid protocol purifies plasmid DNA in 10 minutes.
- **Robust Performance:** High purity and concentration of plasmid DNA gives proven performance in transfection, cell-free expression and other molecular biology applications.
- **Confidence in Results:** Lysis/neutralization indicator dye ensures success every time.
- **Flexible:** Centrifugation and vacuum protocols are available.

Storage Conditions: Store all system components at 22–25°C.

Wizard® *Plus* SV Minipreps DNA Purification Systems

Product	Size	Cat.#
Wizard® *Plus* SV Minipreps DNA Purification System	50 preps	A1330
	250 preps	A1460
	1,000 preps	A1465
Wizard® *Plus* SV Minipreps DNA Purification System + Vacuum Adapters	50 preps	A1340
	250 preps	A1470
Available Separately		
Column Wash Solution (CWA)	185 ml	A1311
Alkaline Protease Solution	3 ml	A1441
Vacuum Adapters	20 each	A1331

A1311 For Laboratory Use. A1330, A1441, A1460, A1331, A1465, A1340, A1470 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Wizard® *Plus* SV Minipreps DNA Purification System, a silica membrane-based system, provides a simple and reliable method for rapid isolation of plasmid DNA. The entire miniprep procedure can be completed in 45 minutes or less, depending on the number of samples processed. Using the system, plasmid DNA can be purified from 1–10ml of overnight *E. coli* culture. The purified plasmid DNA can be used directly for automated fluorescent BigDye® terminator DNA sequencing as well as for other standard molecular biology techniques without further manipulation. It also can be used for in vitro transcription reactions when supplemented with a ribonuclease inhibitor such as Recombinant RNasin® Ribonuclease Inhibitor (Cat.# N2511).

Features:

- **Improved Productivity:** 20 minipreps processed in less than 45 minutes.
- **High Performance:** 1–20µg of high-quality plasmid DNA, enough for multiple applications.
- **Safety and Convenience:** No phenol extractions or precipitations required.
- **Flexibility:** Choice of spin (microcentrifuge) or vacuum purification formats.
- **Consistent Quality:** Alkaline protease step improves plasmid quality.
- **Confidence in Results:** Purified DNA meets a target of >98% accuracy over 500 bases using pGEM®-3Zf(+) Vector in BigDye® terminator sequencing.

Storage Conditions: Store at 22–25°C.

PureYield™ Plasmid Midiprep System

Product	Size	Cat.#
PureYield™ Plasmid Midiprep System	25 preps	A2492
	100 preps	A2495
	300 preps	A2496
Available Separately		
Cell Resuspension Solution (CRA)	315 ml	A7115
Cell Lysis Solution (CLA)	315 ml	A7125
Neutralization Solution (NSB)	500 ml	A1485
Eluator™ Vacuum Elution Device	4 each	A1071

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The PureYield™ Plasmid Midiprep System is designed to isolate transfection-quality plasmid DNA. The system provides a rapid method for purification of 100–200µg of plasmid DNA from 50ml bacteria culture. Plasmid DNA can be purified in as little as 30 minutes with the vacuum protocol, greatly reducing the time spent on purification compared to silica resin or other membrane-column methods. An alternative protocol allows purification of over 400µg of high-copy-number plasmid from 250ml of *E. coli* culture.

The PureYield™ Plasmid Midiprep System incorporates a unique Endotoxin Removal Wash designed to remove substantial amounts of protein, RNA and endotoxin contaminants from purified plasmid DNA. Removal of contaminants improves the robustness of sensitive applications such as eukaryotic transfection, in vitro transcription and coupled in vitro transcription/translation (e.g., TnT® Quick Coupled Transcription/Translation System). Purification is achieved without isopropanol precipitation of purified plasmid DNA or extensive centrifugation, providing rapid purification from a single method.

The system has been designed for use with centrifugation or vacuum (e.g., the Vac-Man® Laboratory Vacuum Manifold).

The Eluator™ Vacuum Elution Device is used to elute nucleic acids from PureYield™ Midiprep or Maxiprep columns. It consists of two pieces, a blue base and a clear column assembly. The base interfaces with a Vacuum Manifold that contains Luer-Lok® fittings, such as the Vac-Man® Laboratory Vacuum Manifold (Cat.# A7231), and holds a 1.5ml tube to capture the eluted nucleic acids. The column assembly accepts PureYield™ Midiprep or Maxiprep columns.

The Eluator™ Device eliminates the requirement for a centrifuge with a swinging bucket rotor for nucleic acid purification, simplifying and speeding purification protocols.

Features:

- **Improved Productivity:** Vacuum protocol allows plasmid DNA purification in as little as 30 minutes.
- **Confidence in Results:** High purity and concentration of plasmid DNA gives proven performance in transfection, in vitro expression and other molecular biology applications.
- **Ease of Use:** Simple protocol eliminates tedious high-speed centrifugation, gravity-drip columns, and post-elution alcohol precipitation.
- **Flexibility:** PureYield™ membrane column allows purification of large amounts of plasmid DNA, exceeding the capabilities of other midiprep systems.

Storage Conditions: Store all system components at 22–25°C.

PureYield™ Plasmid Maxiprep System

Product	Size	Cat.#
PureYield™ Plasmid Maxiprep System	10 preps	A2392
	25 preps	A2393
Available Separately		
Eluator™ Vacuum Elution Device	4 each	A1071

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The PureYield™ Plasmid Maxiprep System isolates transfection-quality plasmid DNA. The system provides a rapid method for purification of up to 1mg of plasmid DNA from a 250ml bacterial culture. Plasmid DNA can be purified rapidly with the vacuum protocol, greatly reducing the time spent on purification compared to silica resin or other membrane-column methods.

The PureYield™ Plasmid Maxiprep System incorporates a unique Endotoxin Removal Wash designed to remove substantial amounts of protein, RNA and endotoxin contaminants from purified plasmid DNA. Removal of contaminants improves the robustness of sensitive applications such as eukaryotic transfection, in vitro transcription and coupled in vitro transcription/translation (e.g., TnT® Quick Coupled Transcription/Translation System). Purification is achieved without isopropanol precipitation of purified plasmid DNA.

The system has been designed for use with a vacuum source and vacuum manifold (e.g., the Vac-Man® Laboratory Vacuum Manifold).

The Eluator™ Vacuum Elution Device is used to elute nucleic acids from PureYield™ Midiprep or Maxiprep columns. It consists of two pieces, a blue base and a clear column assembly. The base interfaces with a Vacuum Manifold that contains Luer-Lok® fittings, such as the Vac-Man® Laboratory Vacuum Manifold (Cat.# A7231), and holds a 1.5ml tube to capture the eluted nucleic acids. The column assembly accepts PureYield™ Midiprep or Maxiprep columns.

The Eluator™ Device eliminates the requirement for a centrifuge with a swinging bucket rotor for nucleic acid purification, simplifying and speeding purification protocols.

Features:

- **Improved Productivity:** Vacuum protocol simplifies purification of multiple samples at one time.
- **Confidence in Results:** High purity and concentration of plasmid DNA gives proven performance in transfection, in vitro expression and other molecular biology applications.
- **Ease of Use:** Simple protocol eliminates tedious, gravity-drip columns and post-elution alcohol precipitation.
- **Flexibility:** PureYield™ membrane column allows purification of large amounts of plasmid DNA, exceeding the capabilities of other maxiprep systems.

Storage Conditions: Store at 22–25°C.

Available in the Helix® on-site stocking system

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Wizard® *Plus* Minipreps DNA Purification Systems

Product	Size	Cat.#
Wizard® *Plus* Minipreps DNA Purification System	50 preps	A7100
	100 preps	A7500
	250 preps	A7510
Available Separately		
Cell Resuspension Solution (CRA)	150 ml	A7112
Cell Lysis Solution (CLA)	150 ml	A7122
Neutralization Solution (NSA)	150 ml	A7131
Column Wash Solution (CWB)	125 ml	A8102
Wizard® Minipreps DNA Purification Resin	250 ml	A7141
Wizard® Minicolumns	250 each	A7211
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The resin-based Wizard® *Plus* Minipreps DNA Purification System provides a simple and reliable method for rapid isolation of plasmid DNA. When using the standard protocol, the entire miniprep process can be completed in 15 minutes or less, with no organic extractions or ethanol precipitations. Minipreps may be processed individually or in multiples with the Vac-Man® (20-sample capacity, Cat.# A7231) or Vac-Man® Jr. (2-sample capacity, Cat.# A7660) Laboratory Vacuum Manifold. DNA is eluted from the Wizard® Minicolumn in Nuclease-Free Water (Cat.# P1193). The purified plasmid can be used directly for automated fluorescent DNA sequencing and restriction digestion without further manipulation and also can be used for in vitro transcription reactions supplemented with a ribonuclease inhibitor, such as Recombinant RNasin® Ribonuclease Inhibitor (Cat.# N2511).

The Wizard® Minipreps DNA Purification Resin is used in the isolation and preparation of plasmid DNA in conjunction with the Wizard® *Plus* Minipreps DNA Purification Systems. The resin is available with the systems and as a standalone product.

Features:

- **High Performance:** DNA is suitable for most molecular biology applications, including fluorescent sequencing.
- **Confidence in Results:** Purified DNA meets a target of >98% accuracy over 500 bases using pGEM®-3Zf(+) Vector in BigDye® terminator sequencing.
- **Fast:** Entire procedure may be completed in 15 minutes or less.
- **Convenient:** No phenol extractions or ethanol precipitations required.

Storage Conditions: Store at 22–25°C.

Wizard® *Plus* Midipreps DNA Purification System

Product	Size	Cat.#
Wizard® *Plus* Midipreps DNA Purification System	25 preps	A7640
Available Separately		
Cell Resuspension Solution (CRA)	150 ml	A7112
Cell Lysis Solution (CLA)	150 ml	A7122
Neutralization Solution (NSA)	150 ml	A7131
Column Wash Solution (CWB)	125 ml	A8102
Wizard® Midipreps DNA Purification Resin	1,000 ml	A7701
Wizard® Midicolumns	100 each	A7651
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The resin-based Wizard® *Plus* Midipreps DNA Purification System provides a simple and reliable method for rapid isolation of plasmid DNA. When using the standard protocol, the entire midiprep process can be completed in 90 minutes or less, yielding up to 200µg of high-quality DNA with no organic extractions or ethanol precipitations. Multiple midipreps can be easily processed at one time with the Vac-Man® (20-sample capacity, Cat.# A7231) or Vac-Man® Jr. (2-sample capacity, Cat.# A7660) Laboratory Vacuum Manifold. DNA is eluted from the Wizard® Midicolumn in Nuclease-Free Water (Cat.# P1193). The purified plasmid can be used directly for automated fluorescent DNA sequencing or restriction digestion without further manipulation and also can be used for in vitro transcription reactions supplemented with a ribonuclease inhibitor such as Recombinant RNasin® Ribonuclease Inhibitor (Cat.# N2511). The system includes sufficient reagents for 25 DNA isolations from 10–100ml of liquid culture.

Features:

- **Fast:** Rapid batch column method used for DNA isolation.
- **Safe:** Eliminates the need for cesium chloride:ethidium bromide gradient centrifugation and does not require organic extractions.
- **Reliable:** Yields plasmid DNA of comparable quantity and quality to cesium chloride:ethidium bromide gradient techniques that are much more time- and labor-intensive.
- **High Performance:** DNA is suitable for restriction enzyme digestions, automated fluorescent DNA sequencing, transformation and subcloning.
- **Confidence in Results:** Purified DNA meets a target of >98% accuracy over 500 bases using pGEM®-3Zf(+) Vector in BigDye® terminator sequencing.

Storage Conditions: Store at 22–25°C.

Wizard® *Plus* Maxipreps DNA Purification System

Product	Size	Cat.#
Wizard® *Plus* Maxipreps DNA Purification System	10 preps	A7270
Available Separately		
Cell Resuspension Solution (CRA)	150 ml	A7112
Cell Lysis Solution (CLA)	150 ml	A7122
Neutralization Solution (NSA)	150 ml	A7131
Column Wash Solution (CWB)	125 ml	A8102
Wizard® Maxipreps DNA Purification Resin	500 ml	A7401
Wizard® Maxi/Megapreps Filtering System	50 each	A7421
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The Wizard® *Plus* Maxipreps DNA Purification System provides a simple and rapid resin-based batch column method for purification of plasmid DNA that eliminates the need for cesium chloride:ethidium bromide gradient centrifugation. Use of this system requires only a centrifuge, a vacuum source and a vacuum manifold. This system typically yields 300µg–1mg of high-copy-number plasmid DNA (200–20,000bp) from a 100–500ml culture in less than three hours. The purified DNA is eluted in Nuclease-Free Water (Cat.# P1193) and can be used directly for DNA sequencing and restriction digestion without further manipulation. The DNA also can be used for in vitro transcription reactions supplemented with a ribonuclease inhibitor such as Recombinant RNasin® Ribonuclease Inhibitor (Cat.# N2511).

Features:

- **Flexible:** DNA is suitable for restriction enzyme digestions, automated fluorescent DNA sequencing, transformation and subcloning.
- **High Quality:** Yields plasmid DNA of comparable quantity and quality to cesium chloride:ethidium bromide gradient techniques that are much more time- and labor-intensive.
- **Fast:** Rapid batch binding and column washing method used for DNA isolation.
- **Safe:** Eliminates the need for cesium chloride:ethidium bromide gradient centrifugation and does not require organic extractions.

Storage Conditions: Store at 22–25°C.

Wizard® *Plus* Megapreps DNA Purification System

Product	Size	Cat.#
Wizard® *Plus* Megapreps DNA Purification System	5 preps	A7300
Available Separately		
Cell Resuspension Solution (CRA)	150 ml	A7112
Cell Lysis Solution (CLA)	150 ml	A7122
Neutralization Solution (NSA)	150 ml	A7131
Column Wash Solution (CWB)	125 ml	A8102
Wizard® Maxi/Megapreps Filtering System	50 each	A7421
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Wizard® *Plus* Megapreps DNA Purification System provides a simple and rapid method for large-scale purifications of plasmid DNA that eliminates the need for cesium chloride:ethidium bromide gradient centrifugation. Use of this system requires only a centrifuge, a vacuum source and a vacuum manifold. The system yields greater than one milligram of high-copy-number plasmid DNA (200–20,000bp) from a 1,000ml culture in less than three hours. The purified DNA is eluted in Nuclease-Free Water (Cat.# P1193) or TE buffer and can be used directly for DNA sequencing and restriction digestion without further manipulation. The DNA also can be used for in vitro transcription reactions supplemented with a ribonuclease inhibitor such as Recombinant RNasin® Ribonuclease Inhibitor (Cat.# N2511).

Features:

- **Fast:** Rapid batch binding and column washing method used for DNA isolation
- **Safe:** Eliminates the need for cesium chloride:ethidium bromide gradient centrifugation and does not require organic extractions.
- **Reliable:** Yields plasmid DNA of comparable quantity and quality to cesium chloride:ethidium bromide gradient techniques that are much more time- and labor-intensive.
- **Yield:** Each megaprep produces >1mg of DNA from 1,000ml of bacterial culture when using a high-copy-number plasmid.
- **Quality:** DNA is suitable for restriction enzyme digestions, automated fluorescent DNA sequencing, transformation and subcloning.

Storage Conditions: Store at 22–25°C.

Available in the Helix® on-site stocking system

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Wizard® SV 96 and SV 9600 Plasmid DNA Purification Systems

Product	Size	Cat.#
Wizard® SV 96 Plasmid DNA Purification System	1 × 96 preps	A2250
	5 × 96 preps	A2255
Wizard® SV 9600 Plasmid DNA Purification System	100 × 96 preps	A2258
Available Separately		
Column Wash Solution (CWA)	185 ml	A1311
Column Wash Solution (CWA)	370 ml	A1318
Wizard® SV 96 Neutralization Solution	500 ml	A1481
	950 ml	A1488
Wizard® SV 96 Cell Resuspension Solution	500 ml	A7113
	800 ml	A7118
Wizard® SV 96 Cell Lysis Solution	500 ml	A7123
	800 ml	A7128
Nuclease-Free Water	150 ml	P1195
Alkaline Protease Solution	3 ml	A1441
Wizard® SV 96 Binding Plates	10 pack	A2271
	100 pack	A2278
Wizard® SV 96 Lysate Clearing Plates	10 pack	A2241
	100 pack	A2248

A1311 For Laboratory Use. A2250, A1318, A2255, A1481, A2258, A1488, A7113, A7118, A7123, A7128, P1195, A1441, A2271, A2278, A2241, A2248 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Wizard® SV 96 and SV 9600 Plasmid DNA Purification Systems provide a simple and reliable method for the rapid isolation of plasmid DNA using a silica-membrane, 96-well, high-throughput format. A single plate can be processed in 60 minutes or less. The purified plasmid can be used directly for automated fluorescent DNA sequencing as well as for other standard molecular biology techniques, including restriction enzyme digestion. The Wizard® SV 96 and SV 9600 Systems are designed for use either in a manual format or with Beckman Coulter or PerkinElmer automated instruments.

Features:

- **Performance by Design:** Vac-Man® 96 Vacuum Manifold eliminates waste handling and allows simultaneous lysate clearing and DNA binding. Novel plate design prevents cross-contamination during sample processing.
- **Flexibility:** Designed for use in both manual and automated formats.
- **Confidence in Results:** Purified DNA meets a target of >98% accuracy over 600 bases using pGEM®-3Zf(+) Vector DNA in BigDye® terminator sequencing.
- **Automation:** Validated automated methods available at: **www.promega.com/automethods/**
- **Your Choice of Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at 22–25°C.

Wizard® MagneSil® Plasmid Purification System

Product	Size	Cat.#
Wizard® MagneSil® Plasmid Purification System	4 × 96 preps	A1630
	8 × 96 preps	A1631
Wizard® MagneSil® Plasmid Purification System, HTP1	100 × 96 preps	A1635
Available Separately		
MagneSil® RED	100 ml	A1641
MagneSil® BLUE	100 ml	A2201
Cell Resuspension Solution	500 ml	A7114
Cell Lysis Solution	500 ml	A7124
Neutralization Solution	500 ml	A7132
Elution Buffer	500 ml	A1655
Collection Plates (4-pack)	1 each	A9161

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Wizard® MagneSil® Plasmid DNA Purification System provides a simple and reliable method for the rapid isolation of plasmid DNA in a 96-well, high-throughput format. The purified plasmid can be used directly for automated fluorescent sequencing, such as with BigDye® terminator sequencing chemistry, as well as for other standard molecular biology techniques including restriction enzyme digestion.

The use of the MagneSil® Paramagnetic Particles for lysate clearing (BLUE) as well as DNA capture (RED) circumvents the need for centrifugation or vacuum manifolds, making the system ideal for full automation on a Beckman Coulter or Tecan instrument.

Features:

- **Improve Productivity:** Process multiple plates without user intervention.
- **Gain Confidence:** Consistent performance in fluorescent sequencing reactions.
- **Automate This Assay:** Validated automated methods available at: **www.promega.com/automethods/**
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at 22–25°C.

Wizard MagneSil Tfx™ System

Product	Size	Cat.#
Wizard MagneSil Tfx™ System	4 × 96 preps	A2380
Available Separately		
Endotoxin Removal Resin	100 ml	A2191
4/40 Wash Solution	115 ml	A2221

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Wizard MagneSil Tfx™ System provides a simple and reliable method for the rapid isolation of transfection-quality plasmid DNA in a 96-well, high-throughput format. The use of MagneSil® Paramagnetic Particles for lysate clearing as well as DNA capture circumvents the need for centrifugation or vacuum manifolds, allowing DNA purification with the Wizard MagneSil Tfx™ System to be completely automated.

An automated method has been developed for use of this product with a Beckman Coulter Biomek® FX robotic workstation. This procedure requires approximately 45 minutes to process a single 96-well plate. The method can be adapted to other robotic workstations, such as the Beckman Coulter Biomek® 2000 or the Tecan Genesis® instrument.

Features:

- **Improve Transfection Results:** Use of Endotoxin Removal Resin cuts endotoxin carryover as much as 95% over standard sequencing-grade automated plasmid systems.
- **Enhance Mammalian Protein Expression:** Three- to fivefold increase in protein expression compared to plasmid isolated from an automated sequencing-grade plasmid purification system.
- **Automate This Assay:** Validated automated methods available at: **www.promega.com/automethods/**
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at 22–25°C.

RNA Extraction

ReliaPrep™ miRNA Cell and Tissue Miniprep System

Product	Size	Cat.#
ReliaPrep™ miRNA Cell and Tissue Miniprep System	10 preps	Z6210
	50 preps	Z6211
	250 preps	Z6212

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: ReliaPrep™ miRNA Cell and Tissue Miniprep System provides complete isolation of total RNA, including microRNA (miRNA) and other small non-coding RNA (sncRNA) subspecies, from a wide variety of cell and tissue types as quickly as 40 minutes. The proprietary column/binding matrix can efficiently capture total RNA, including miRNA, from very small amounts of input material. Using this membrane-based purification system, 1×10^2 to 1×10^6 cultured cells or 0.25–20mg of tissue can be processed per purification. The system incorporates a DNase treatment step, which effectively removes substances that can inhibit downstream assays.

Features:

- **Easily Extract Total RNA in 40 Minutes:** Experience superior ease of use compared to competitive purification chemistries; whether you're a novice or an expert, 40-minute protocol reliably extracts total RNA, including miRNA.
- **Eliminate Harsh Organic Reagents:** Bring your miRNA extraction out of the hood and onto your bench. Save money by eliminating the costly disposal of hazardous organic waste.
- **Isolate Pure RNA:** Consistently isolate pure total RNA, including miRNA and other small non-coding RNAs, through an optimized chemistry.
- **Work with Low Elution Volumes:** Extract high concentrations of amplifiable mRNA, miRNA and other small non-coding RNA in elution volumes that meet the needs of your downstream assays.

Storage Conditions: Store at 15–30°C.

ReliaPrep™ FFPE Total RNA Miniprep System

Product	Size	Cat.#
ReliaPrep™ FFPE Total RNA Miniprep System	10 reactions	Z1001
	100 reactions	Z1002
Available Separately		
Microtubes, 1.5ml	1,000 /bag	V1231
ClickFit Microtube, 1.5ml	1,000 /pack	V4741

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ReliaPrep™ FFPE Total RNA Miniprep System provides a complete, all-inclusive method for purification of quality total RNA from formalin-fixed paraffin-embedded tissue without using hazardous solvents or overnight digestion. Total RNA can be isolated from FFPE tissue in approximately one and one-half hours with minimal hands-on time.

Features:

- **Easy to Use:** Minimal preparation time.
- **Safe:** Deparaffinization step occurs without harsh organic solvents.
- **Isolate Quality, Intact Total RNA:** Fine-tuned protocol results in high-quality, intact, amplifiable total RNA.

Storage Conditions: Store at room temperature.

Available in the Helix® on-site stocking system

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ReliaPrep™ RNA Miniprep Systems

Product	Size	Cat.#
ReliaPrep™ RNA Cell Miniprep System	10 preps	Z6010
	50 preps	Z6011
	250 preps	Z6012
ReliaPrep™ RNA Tissue Miniprep System	10 preps	Z6110
	50 preps	Z6111
	250 preps	Z6112

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ReliaPrep™ RNA Miniprep Systems provide a fast and simple technique for preparation of intact total RNA from cultured cells or tissue in as little as 30 minutes. The proprietary column/binding matrix can efficiently capture RNA from very small amounts of input material, isolating RNA eluted in a minimal volume (less than 15µl). Using this membrane-based purification system, from 100 to 5 × 10^6 cultured cells or 0.25 to 20mg of tissue can be processed per purification. The system incorporates a DNase treatment step directly on the minicolumn membrane and effectively removes substances that can inhibit downstream assays. Purification is achieved without the use of phenol:chloroform extractions or ethanol precipitations, resulting in pure RNA that does not require additional purification or concentration of the RNA for use in demanding applications.

Features:

- **Be Efficient:** Allows use of precious samples.
- **Have Confidence:** Provides maximum sensitivity for downstream assays without worry of inhibition when measuring low-copy-number targets.
- **Save Effort:** No need to further concentrate samples for use.
- **Save Time:** Rapid protocol and provided DNase reagents streamline laboratory processes.

Storage Conditions: Store at 15–30°C.

SV Total RNA Isolation System

Product	Size	Cat.#
SV Total RNA Isolation System	10 preps	Z3101
	50 preps	Z3100
	250 preps	Z3105
Available Separately		
Red Blood Cell Lysis Solution (CLB)	200 ml	Z3141
RNA Lysis Buffer (RLA)	50 ml	Z3051

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The SV Total RNA Isolation System provides a fast and simple technique for preparation of intact total RNA from tissues, cultured cells and white blood cells in as little as one hour. Using this membrane-based purification system, up to 60mg of tissue can be processed per purification, depending on tissue type. The system incorporates a DNase treatment step directly on the minicolumn membrane. This step substantially reduces genomic DNA contamination, which can interfere with amplification-based methodologies. Purification is achieved without the use of phenol:chloroform extractions or ethanol precipitations, and there is no DNase carryover in the final RNA preparation.

Features:

- **Safety and Efficiency:** Rapid isolation of high yields of total RNA without the use of hazardous compounds like phenol.
- **Flexibility:** Single system for isolation directly from blood, cells or tissue. Two methods available for purification: microcentrifugation (spin) or vacuum.
- **Confidence:** Purified RNA suitable for all routine molecular biology applications, including RT-PCR and Northern blotting.

Storage Conditions: Store at 22–25°C.

PureYield™ RNA Midiprep System

Product	Size	Cat.#
PureYield™ RNA Midiprep System	10 preps	Z3740
	50 preps	Z3741
Available Separately		
RNA Lysis Buffer (RLA)	50 ml	Z3051
RNA Wash Solution (RWA)	58.8 ml	Z3091
Red Blood Cell Lysis Solution (CLB)	200 ml	Z3141
Eluator™ Vacuum Elution Device	4 each	A1071

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The PureYield™ RNA Midiprep System isolates intact, pure total RNA from essentially any sample type for use in a wide range of applications. The use of a novel Clearing Agent enables the rapid purification of total RNA with undetectable levels of genomic DNA contamination without using DNase. A novel combination of reagents, membranes and protocol leads to yields of up to 1mg of total RNA without organic solvents, protease digestions or alcohol precipitations. One kit can be used to isolate pure total RNA from a wide variety of sample types, such as tissues, cultured cells, bacteria, yeast, plants and blood. The protocol also can be adapted for other sample types.

Commonly used methods provide total RNA that is contaminated with genomic DNA. This contamination can interfere with sensitive methods, such as real-time RT-PCR and microarray analysis. The PureYield™ RNA Midiprep System avoids this problem by selectively removing the genomic DNA prior to total RNA purification. The eluted total RNA is free of detectable DNA and ready for use in sensitive downstream applications.

The system has been designed for use with centrifugation or vacuum (e.g., the Vac-Man® Laboratory Vacuum Manifold) formats.

The Eluator™ Vacuum Elution Device is used to elute nucleic acids from PureYield™ Midiprep or Maxiprep columns. It consists of two pieces, a blue base and a clear column assembly. The base interfaces with a Vacuum Manifold that contains Luer-Lok® fittings, such as the Vac-Man® Laboratory Vacuum Manifold (Cat.# A7231), and holds a 1.5ml tube to capture the eluted nucleic acids. The column assembly accepts PureYield™ Midiprep or Maxiprep columns.

The Eluator™ Device eliminates the requirement for a centrifuge with a swinging bucket rotor for nucleic acid purification, simplifying and speeding purification protocols.

Features:

- **Enhanced Results:** Purified total RNA with undetectable genomic DNA contamination improves results in downstream applications.
- **Improved Productivity:** Purifying total RNA without the use of DNase treatment reduces steps during purification and in downstream applications.
- **Safety and Efficiency:** Rapid purification of high yields of total RNA without the use of hazardous organic solvents.
- **Flexibility:** Single system for purifying total RNA directly from cultured cells, bacteria, yeast, plants and other sample types.

Storage Conditions: Store the RNA Lysis Buffer (RLA) with added β-Mercaptoethanol (BME) at 4°C. Store all other components at 22–25°C.

RNAgents® Denaturing Solution

Product	Size	Cat.#
RNAgents® Denaturing Solution	120 ml	Z5651

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: RNAgents® Denaturing Solution lyses cells or tissue under conditions that rapidly inhibit ribonucleases, using two potent inhibitors of RNase, guanidine thiocyanate and β-mercaptoethanol. The RNAgents® Denaturing Solution is designed to be used in concert with acidic phenol:chloroform and alcohol (isopropanol) for purification of total RNA.

Storage Conditions: Store at 4°C.

SV 96 Total RNA Isolation System

Product	Size	Cat.#
SV 96 Total RNA Isolation System	1 × 96 each	Z3500
	5 × 96 each	Z3505
Available Separately		
RNA Lysis Buffer (RLA)	50 ml	Z3051
RNA Wash Solution (RWA)	58.8 ml	Z3091
Nuclease-Free Water	150 ml	P1195
Wizard® SV 96 Binding Plates	10 pack	A2271

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The SV 96 Total RNA Isolation System provides a high-throughput technique to prepare intact RNA from tissue and cultured cells. Total RNA can be purified from 96 samples in less than an hour without centrifugation. The system also incorporates a DNase treatment step that is designed to substantially reduce genomic DNA contamination, which can interfere with amplification-based methodologies. Purification is achieved without phenol:chloroform extraction or ethanol precipitation, and there is no detectable DNase carryover in the final RNA preparation.

Protocols are available for Beckman Coulter and PerkinElmer instruments.

Features:

- **Confidence in Results:** The product is tested to ensure that purified RNA will perform optimally in RT-PCR.
- **Unique Design:** Novel vacuum manifold eliminates waste handling. Novel plate design prevents cross-contamination during sample processing.
- **Flexibility:** The system is designed for both manual and automated formats.
- **Automation:** Validated automated methods available at: **www.promega.com/automethods/**
- **Your Choice of Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store the SV RNA Lysis Buffer with β-Mercaptoethanol (BME) added at 4°C. Store all other components at 22–25°C.

MagneSil® Total RNA mini-Isolation System

Product	Size	Cat.#
MagneSil® Total RNA mini-Isolation System	4 plate	Z3351

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The MagneSil® Total RNA mini-Isolation System provides a high-throughput 96-well format for fast, simple preparation of intact total RNA from small amounts of cell culture (≤1 × 10^5 tissue culture cells), tissue (≤2mg tissue lysate in 100µl) or freshly isolated whole blood (≤20µl). The protocol enables high-throughput automated purification on a variety of liquid-handling workstations. Isolation of total RNA in a 384-well format from cell culture (≤1 × 10^3 cells) and freshly isolated whole blood (≤5µl) also may be performed. Total RNA purification is achieved without vacuum filtration, centrifugation or precipitation. The 96-well total RNA isolation procedure takes about 30 minutes to complete using a liquid-handling workstation.

Total RNA purified using this system is suitable for a variety of molecular biology applications including endpoint RT-PCR amplification and real-time RT-PCR.

Features:

- **Improve Productivity:** Only 30 minutes are required to process one 96-well plate, or 50 minutes for one 384-well plate on a Beckman Coulter Biomek® FX liquid handler.
- **Improve Real-Time PCR Performance:** Elution volumes as low as 15µl provide concentrated RNA without the need for time-consuming vacuum concentration.
- **Gain Confidence in Results:** DNase I treatment is included to remove genomic DNA contamination.
- **Achieve Convenience:** Robotic protocols require no user intervention once you start the automated robotic method.
- **Automate This Assay:** Validated automated methods are available at: **www.promega.com/automethods/**

Storage Conditions: Store at 22–25°C.

Available in the Helix® on-site stocking system

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PolyATtract® System 1000

Product	Size	Cat.#
PolyATtract® System 1000 with Magnetic Stand	Scalable	Z5420
PolyATtract® System 1000 without Magnetic Stand	Scalable	Z5400
PolyATtract® System 1000 Magnetic Separation Stand	1 each	Z5410
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The PolyATtract® System 1000 isolates messenger RNA directly from crude cell or tissue lysates, eliminating the need for total RNA isolations. This system uses the MagneSphere® technology for the purification of poly(A)+ RNA, eliminating the need for oligo(dT) cellulose columns. The increased yield of mRNA using this system allows the detection of low-copy-number mRNAs in relatively small amounts of material using Northern blot analysis. The isolated mRNA is suitable for all molecular biology applications, including in vitro translation, cDNA synthesis, PCR analysis, ribonuclease (RNase) protection assays, primer extension and Northern blots.

The MagneSphere® Technology Magnetic Separation Stands can be used in conjunction with any of the PolyATtract® Systems and are ideal for applications requiring multiple paramagnetic isolations of biomolecules.

Features:

- **Improved Productivity:** mRNA purification directly from tissue or cells in 45 minutes or less. Allows quick collection of magnetic particles.
- **Flexibility:** Works with tissue amounts from 5mg–2g per isolation. Magnetic separation stand (Cat.# Z5410) accommodates 1.5ml, 2ml, 15ml and 50ml tube sizes.
- **Convenience:** No lengthy ethanol precipitation steps, phenol:chloroform extractions, or overnight ultracentrifugation through cesium chloride gradients and lithium chloride (LiCl) precipitations.

Storage Conditions: Store at 4°C. Do not freeze the MagneSphere® Paramagnetic Particles.

Streptavidin MagneSphere® Paramagnetic Particles

Product	Size	Conc.	Cat.#
Streptavidin MagneSphere® Paramagnetic Particles	9 ml	1 mg/ml	Z5481
	25 ml	1 mg/ml	Z5482
For Laboratory Use.			

Description: The Streptavidin MagneSphere® Paramagnetic Particles (PMPs) may be used in the magnetic separation and purification of a wide variety of biotinylated nucleic acid or protein molecules. The particles are quality-tested and approved for isolation of biotinylated nucleic acids, proteins and antibodies.

Features:

- **Confidence:** The Streptavidin MagneSphere® Paramagnetic Particles feature strong, specific binding to biotinylated molecules.
- **Improved Purity:** Enable binding, washing and magnetic separation from undesired materials in a solution.
- **Flexibility:** Applications include purification of DNA, mRNA and proteins.

Storage Conditions: Store at 4°C. Do not freeze the paramagnetic particles.

PolyATtract® mRNA Isolation Systems

Product	Size	Cat.#
PolyATtract® mRNA Isolation System I (Refill for Z5200)	3 isolations	Z5210
PolyATtract® mRNA Isolation System II with Magnetic Stand	3 isolations	Z5200
PolyATtract® mRNA Isolation System III with Magnetic Stand	15 isolations	Z5300
PolyATtract® mRNA Isolation System IV (Refill for Z5300)	15 isolations	Z5310
Available Separately		
Biotinylated Oligo(dT) Probe (50pmol/µl)	35 µl	Z5261
MagneSphere® Technology Magnetic Separation Stand (two-position)	1.5 ml	Z5332
	12 × 75 mm	Z5333
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The PolyATtract® mRNA Isolation Systems use the MagneSphere® technology to isolate mRNA rapidly and effectively from total RNA. The systems use a biotinylated oligo(dT) primer to hybridize, at high efficiency in solution, to the 3´ poly(A)+ region present in most mature eukaryotic mRNAs. The hybrids are bound to streptavidin coupled to paramagnetic particles, captured using a magnetic separation stand and washed at high stringency. The mRNA is eluted from the solid phase by the simple addition of ribonuclease-free, deionized water. With total RNA as the starting material, poly(A)+ mRNA is isolated in approximately 45 minutes. The isolated mRNA is suitable for all molecular biology applications, including in vitro translation and cDNA synthesis.

Cat.# Z5200 contains sufficient reagents for 3 separate mRNA isolations, each from 1–5mg of total RNA. Cat.# Z5210 contains the same reagents as Cat.# Z5200, excluding the Magnetic Separation Stand. Cat.# Z5300 contains sufficient reagents for 15 separate mRNA isolations, each from 100–1,000µg of total RNA. Cat.# Z5310 contains the same reagents as Cat.# Z5300, excluding the Magnetic Separation Stand.

Features:

- **Improved Productivity:** Entire mRNA purification process can be completed in approximately 45 minutes.
- **Highly Pure mRNA:** Due to the strength and selectivity of the interaction between streptavidin and biotin, mRNA bound to the biotinylated oligo(dT) is captured by streptavidin-coated magnetic particles.
- **Confidence in Your Applications:** Isolated mRNA is suitable for use with in vitro translation, RT-PCR and cDNA synthesis.
- **Flexibility:** Configurations for use with large or small amounts of cells and tissues.

Storage Conditions: Store at 4°C. Do not freeze the MagneSphere® Paramagnetic Particles.

Maxwell® 16 System RNA Purification Kits

Product	Size	Cat.#
Low Elution Volume (LEV)		
Maxwell® 16 miRNA Tissue Kit	48 preps	AS1470
Maxwell® 16 LEV simplyRNA Cells Kit	48 preps	AS1270
Maxwell® 16 LEV simplyRNA Tissue Kit	48 preps	AS1280
Maxwell® 16 LEV simplyRNA Blood Kit	48 preps	AS1310
Maxwell® 16 Tissue LEV Total RNA Purification Kit	48 preps	AS1220
Maxwell® 16 Cell LEV Total RNA Purification Kit	48 preps	AS1225
Maxwell® 16 LEV RNA FFPE Kit	48 preps	AS1260
Maxwell® 16 LEV Plant RNA Kit	48 preps	AS1430
Available Separately		
Maxwell® 16 Flexi Method Firmware	1 each	AS6411
Maxwell® 16 High Strength LEV Magnetic Rod and Plunger Bar Adaptor	1 each	SP1070
LEV Plungers	50 /pk	AS6101
LEV Elution Tubes	50 /pk	AS6201
SEV Plungers	50 /pk	AS5201
SEV Elution Tubes	50 /pk	AS5101

AS1470, AS1310, AS1260, AS1430, SP1070, AS6101, AS6201, AS5201, AS5101 For Research Use Only. Not for Use in Diagnostic Procedures. AS1270, AS1280, AS1220, AS1225, AS6411 For Laboratory Use.

Description: The Maxwell® 16 LEV simplyRNA Cells Kit, Maxwell® 16 LEV simplyRNA Blood Kit, Maxwell® 16 LEV simplyRNA Tissue Kit, Maxwell® 16 Tissue LEV Total RNA Purification Kit, Maxwell® 16 Cell LEV Total RNA Purification Kit, Maxwell® 16 LEV RNA FFPE Kit and Maxwell® 16 LEV Plant RNA Kit are for use with the Maxwell® 16 Instrument configured with the LEV High Strength Magnetic Rod and Plunger Bar Adaptor. This RNA purification procedure is a simple method with minimal lysate handling before automated purification on the Maxwell® 16 Instrument. The low elution volume is used to generate concentrated high-quality RNA suitable for use in downstream applications such as quantitative RT-PCR. The kit provides the reagents for processing the samples and uses prefilled cartridges for purification, maximizing simplicity and convenience.

The simple protocols require adding a cleared lysate to the reagent cartridge. Simply place the reagent cartridge into the Maxwell® 16 Instrument, and press start. Purified RNA is obtained in less than 45 minutes of hands-free instrument operation. No post-purification treatment with nuclease, cleanup or concentration is required to achieve superior performance in downstream applications.

Features:

- **Enjoy Confidence in Your Application Results:** Essentially undetectable contaminating genomic DNA means fewer repeated experiments and unexplained or variable results.
- **Choose Your Sample Type:** Flexibility to purify from tissue, cells, blood and other samples.
- **Achieve High Yield and High Concentration:** High yields and high-concentration total RNA result in better performance in gene expression analysis applications.

Maxwell® RSC System RNA Purification Kits

Product	Size	Cat.#
Maxwell® RSC miRNA Tissue Kit	48 preps	AS1460
Maxwell® RSC RNA FFPE Kit	48 preps	AS1440
Maxwell® RSC miRNA Plasma and Serum Kit	48 preps	AS1680
Maxwell® RSC simplyRNA Blood Kit	48 preps	AS1380
Maxwell® RSC simplyRNA Tissue Kit	48 preps	AS1340
Maxwell® RSC simplyRNA Cells Kit	48 preps	AS1390
Maxwell® RSC Plant RNA Kit	48 preps	AS1500

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Maxwell® Rapid Sample Concentrator (RSC) Instrument is an automated nucleic acid purification system that processes up to 16 samples in a single run. The instrument is used with the prefilled reagent cartridges provided in the Maxwell® RSC Purification Kits to purify DNA or RNA from a wide range of sample types. The intuitive graphical user interface makes the instrument easy to use, and the integrated Quantus™ Fluorometer lets you collect purification and quantification data in one report.

These kits can be used for automated RNA purification with the Maxwell® RSC Instrument.

Maxwell® RSC miRNA Tissue Kit

- Purifies total RNA, including miRNA, from mammalian tissue samples
- Eliminates use of hazardous organic solvents.

Maxwell® RSC RNA FFPE Kit

- Purifies amplifiable RNA from FFPE tissue samples.
- Eliminates use of hazardous organic solvents.

Maxwell® RSC miRNA Plasma and Serum Kit

- High-quality, amplifiable RNA from mammalian plasma, serum or enriched exosomes
- Simple, safe RNA extraction without organic reagents
- Automated RNA extraction of 1–48 samples in a single run

Maxwell® RSC simplyRNA Tissue Kit

- Purifies total RNA from up to 20mg of tissue in under an hour.
- Reduces pre-extraction sample handling to 4 steps.

Maxwell® RSC simplyRNA Cells Kit

- Purifies total RNA from fresh or frozen cells in under an hour.
- Reduces pre-extraction sample handling to 4 steps.

Maxwell® RSC simplyRNA Blood Kit

- Purifies total RNA from 2.5ml of fresh whole blood.
- Reduces centrifugation steps.
- Yields highly concentrated RNA from up to 16 samples in under an hour.

Maxwell® RSC Plant RNA Kit

- Extracts RNA from a range of plant sample types with no organic reagents.
- Cellulose-based paramagnetic particles offer higher binding capacity for increased yields.
- Extracted RNA is ready for downstream applications.

Available in the Helix® on-site stocking system

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Total Nucleic Acid Extraction

Maxwell RSC Viral Total Nucleic Acid Purification Kit

Product	Size	Cat.#
Maxwell® RSC Viral Total Nucleic Acid Purification Kit	48 preps	AS1330
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The Maxwell® RSC Viral Total Nucleic Acid Purification Kit purifies samples using paramagnetic particles, which provide a mobile solid phase to optimize sample capture, washing and purification of nucleic acid. The Maxwell® RSC and Maxwell® RSC 48 Instruments are magnetic particle-handling instruments that efficiently bind nucleic acids to theparamagnetic particle in the first well of a prefilled cartridge. The samples are processed through a series of washes before the total nucleic acid is eluted.

Features:

- Extracts viral total nucleic acid (RNA and DNA) from serum, plasma and other samples following brief lysis step
- Accommodates a range of samples sizes from 100–300µl
- Yields highly concentrated nucleic acids that are ready to use in downstream applications

Storage Conditions: Store at 15–30°C.

Maxwell 16 Viral Total Nucleic Acid Purification Kit

Product	Size	Cat.#
Maxwell® 16 Viral Total Nucleic Acid Purification Kit	48 preps	AS1150
Maxwell® 16 Viral Total Nucleic Acid Purification System (IVD)	48 preps	AS1155
AS1150 For Laboratory Use. AS1155 For In Vitro Diagnostic Use. This product is only available in certain countries.		

Description: The Maxwell® 16 Viral Total Nucleic Acid Purification Kit is used with the Maxwell® 16 Instrument to extract viral total nucleic acid (RNA and DNA) from serum or plasma samples. The kit contains all necessary reagents in convenient prefilled cartridges. The simple protocol involves three main steps. First, lysis buffer and proteinase K are mixed to prepare a lysis solution. Second, lysis solution is mixed with sample. Third, the lysate is added into the cartridges. Purified viral total nucleic acids are ready for analysis in approximately 45 minutes. Purified nucleic acids are ready for use in applications such as qPCR and qRT-PCR.

The Maxwell® System provides efficient processing and higher sample capacity than comparable systems, without detectable cross-contamination between samples, speeding sample processing and reducing rework.

Features:

- Accommodates a range of sample sizes from 100–300µl
- Yields concentrated nucleic acids ready-for-use in downstream applications

Storage Conditions: Store at 15–30°C.

Wizard® SV Gel and PCR Clean-Up System

Product	Size	Cat.#
Wizard® SV Gel and PCR Clean-Up System	50 preps	A9281
	250 preps	A9282
	1,000 preps	A9285
Wizard® SV Gel and PCR Clean-Up System and x-tracta™ Gel Extractor Bundle	50 preps/25 extractors	A9283
	250 preps/100 extractors	A9284
Available Separately		
Membrane Binding Solution	20 ml	A9301
Vacuum Adapters	20 each	A1331
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The Wizard® SV Gel and PCR Clean-Up System is designed to extract and purify DNA fragments of 100bp to 10kb from standard or low-melting agarose gels or to purify products directly from PCR and other common reactions such as restriction digests. Up to 95% recovery is achieved depending upon the DNA fragment size. PCR products are commonly purified to remove excess nucleotides and primers. This membrane-based system, which can bind up to 40µg of DNA, allows recovery of isolated DNA fragments or PCR products in as little as 15 minutes, depending on the number of samples processed. The purified DNA can be used for automated fluorescent DNA sequencing, cloning, labeling, restriction enzyme digestion or in vitro transcription/translation without further manipulation.

Features:

- **Improved Productivity:** Purify DNA fragments or PCR products in as little as 15 minutes.
- **Enhanced Cloning Results:** Up to 95% recovery eluted in as little as 15µl.
- **Confidence in Results:** Purified DNA routinely achieves 700 bases with >98% accuracy in automated fluorescent sequencing.
- **Applications Tested:** DNA is suitable for automated fluorescent sequencing, cloning, labeling, restriction enzyme digestion or in vitro transcription/translation without further manipulation.
- **One System to Do It All:** One system can replace up to four kits from other suppliers.

Storage Conditions: Store at 22–25°C.

ReliaPrep™ RNA Clean-Up and Concentration System

Product	Size	Cat.#
ReliaPrep™ RNA Clean-Up and Concentration System	10 preps	Z1071
	50 preps	Z1072
	250 preps	Z1073
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The ReliaPrep™ RNA Clean-Up and Concentration System is designed to reduce carryover of reagents and concentrate samples in a simple, fast protocol. The system can process dilute samples or sample pools up to 300µl in a single column and elute them in 15µl of water or TE buffer. It maintains good recovery of RNA samples and ensures usefulness in downstream applications such as RT-qPCR, Northern blot analysis or RNA sequencing.

Features:

- Column-based method for rapid concentration and clean-up of RNA
- High binding capacity to accommodate large samples
- Small elution volumes provide highly concentrated samples and remove inhibitors

Storage Conditions: Store at 15–30°C.

Available in the Helix® on-site stocking system

ReliaPrep™ DNA Clean-Up and Concentration System

Product	Size	Cat.#
ReliaPrep™ DNA Clean-Up and Concentration System	10 preps	A2891
	50 preps	A2892
	250 preps	A2893

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ReliaPrep™ DNA Clean-Up and Concentration System is designed to quickly concentrate and purify dilute DNA solutions, extract and purify DNA fragments of 100bp–10kb from standard or low-melt agarose gels in either Tris acetate (TAE) or Tris borate (TBE) buffer, or to purify products directly from a PCR amplification. This membrane-based system can bind up to 60µg of DNA and concentrate as much as 300µl of dilute DNA, recovering isolated DNA fragments or PCR products in as little as 10 minutes, depending on the number of samples processed and the protocol used.

A single reagent stream is used for all three procedures, making the system both fast and easy. The purified DNA can be used for automated fluorescent DNA sequencing, cloning, labeling, restriction enzyme digestion, next-generation sequencing or in vitro transcription/translation.

The ReliaPrep™ DNA Clean-Up and Concentration System can be used with linear DNA fragments, supercoiled plasmid DNA or single-stranded linear or circular DNA.

Features:

- Column-based method for rapid concentration and clean-up of DNA
- High binding capacity to accommodate large samples
- Small elution volumes provide highly concentrated samples and remove inhibitors

Storage Conditions: Store at 15–30°C.

x-tracta™ Gel Extractor

Product	Size	Cat.#
x-tracta™ Gel Extractor	25 /pack	A2121
	100 /pack	A2122
Wizard® SV Gel and PCR Clean-Up System and x-tracta™ Gel Extractor Bundle	50 preps/25 extractors	A9283
	250 preps/100 extractors	A9284

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The x-tracta™ Gel Extractor tool provides a convenient, safe method for removal of agarose gel fragments for further processing. The device removes a 0.13 × 0.33 inch gel piece from agarose gels for easy transfer into a microcentrifuge tube for processing. The x-tracta™ tool eliminates the need for razor blades or scalpels, and its single-use design eliminates the possibility for sample-to-sample cross-contamination.

Note: The x-tracta™ Gel Extractor works best on 0.6–2% analytical grade agarose gels. Please exercise caution if using the x-tracta™ Gel Extractor on Low Melting Point (LMP) agarose gels because the extractor does not work effectively on these due to the gel consistency.

Storage Conditions: Store at 22–25°C.

Wizard® PCR Preps DNA Purification System

Product	Size	Cat.#
Wizard® PCR Preps DNA Purification System	50 preps	A7170
	250 preps	A2180
Available Separately		
Wizard® PCR Preps DNA Purification Resin	250 ml	A7181
Direct Purification Buffer	25 ml	A7241
Wizard® Minicolumns	250 each	A7211
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The Wizard® PCR Preps DNA Purification System provides a simple, reliable way to purify double-stranded PCR-amplified DNA. Using the 15-minute batch column purification method, PCR products are effectively separated from contaminants, including primer-dimers and amplification primers. This system also can be used to purify DNA fragments from agarose gels. The DNA can be eluted in water or TE buffer, free of salts or macromolecular contaminants. Multiple PCR Preps may be processed easily at one time with the Vac-Man® Laboratory Vacuum Manifold (Cat.# A7231).

Features:

- **Improved Productivity:** Purify PCR products directly from reactions in 15 minutes.
- **Flexibility:** Separate PCR products from other reaction components such as primers and primer-dimers or from gel slices.
- **Labor Saving Format:** Process multiple purifications simultaneously using the Vac-Man® Laboratory Vacuum Manifold.

Storage Conditions: Store at 22–25°C.

Wizard® DNA Clean-Up System

Product	Size	Cat.#
Wizard® DNA Clean-Up System	100 preps	A7280
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The Wizard® DNA Clean-Up System provides a simple and effective way to purify linear and circular DNA (200–50,000bp) from many molecular biology reactions. Using a quick batch-column procedure, the entire process can be completed in 15 minutes or less with no organic extractions or ethanol precipitations. DNA is eluted in water or TE buffer, ready for use. Multiple preps may be processed easily at one time with the Vac-Man® Laboratory Vacuum Manifold (Cat.# A7231).

Features:

- **Improved Productivity:** Results in 15 minutes or less.
- **Convenience:** No phenol extractions or ethanol precipitations.
- **Flexibility:** Works with a wide range of DNA sizes from 200–50,000bp in length.

Storage Conditions: Store at 22–25°C.

Available in the Helix® on-site stocking system

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Wizard® SV 96 PCR Clean-Up System

Product	Size	Cat.#
Wizard® SV 96 PCR Clean-Up System	1 × 96 preps	A9340
	4 × 96 preps	A9341
	8 × 96 preps	A9342
	100 × 96 preps	A9345
Available Separately		
Membrane Binding Solution	20 ml	A9301
Wizard® SV 96 Binding Plates	10 pack	A2271

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Wizard® SV 96 PCR Clean-Up System is designed for high-throughput purification of 100bp to 10kb PCR products from excess nucleotides, primers and primer dimers. This membrane-based system allows recovery of >90% in as little as 20 minutes. The purified DNA can be used for automated fluorescent sequencing, cloning, labeling, restriction digestion or microarray analysis without further manipulation. The Wizard® SV 96 PCR Clean-Up System uses 96-well filtration without the need to disassemble the manifold. Filtrate waste is delivered directly to a vacuum trap, eliminating the need to dispose of collected waste within the manifold assembly. Protocols are available for automated instruments from Beckman Coulter and PerkinElmer.

Features:

- **High Performance:** Optimized methods deliver purified PCR products suitable for demanding applications such as microarray analysis.
- **Confidence:** Average recovery for 100–500bp fragments of >90%. Automated fluorescent sequencing Phred* 20 scores >600.
- **Automation:** Validated automated methods available at: **www.promega.com/automethods/**
- **Your Choice of Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

*A Phred score is a widely recognized method to measure the quality of DNA sequences. Phred is a base-calling program for DNA sequence traces available from Codoncode Corporation.

Storage Conditions: Store at 22–25°C.

Wizard® MagneSil® Sequencing Reaction Clean-Up System

Product	Size	Cat.#
Wizard® MagneSil® Sequencing Reaction Clean-Up System	4 × 96 preps	A1831
	8 × 96 preps	A1832
Wizard® MagneSil® Sequencing Reaction Clean-Up System, HTP1	100 × 96 preps	A1835
Available Separately		
MagneSil® GREEN	100 ml	A8231

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Wizard® MagneSil® Sequencing Reaction Clean-Up System was developed for high-throughput purification of sequencing reactions, including BigDye® Terminator reactions. Cleanup is performed using the proprietary MagneSil® GREEN Paramagnetic Particles with standard, nonskirted 96-well amplification plates. No user intervention is required from the time the plates are placed on the instrument until the samples are ready for loading onto the fluorescent DNA sequencer. Protocols are available for automated instruments from Beckman Coulter and Tecan.

The system relies upon the MagnaBot® II for magnetic separation. The Plate Clamp 96 and Plate Stand are recommended for automated use because they ensure PCR plates are uniformly flat for liquid transfer on a robotic instrument.

Features:

- **Get Immediate Results:** Validated, walkaway method.
- **Gain Confidence in Results:** Purified products are approved for fluorescent sequencing reactions. Phred* 20 quality scores ≥650 bases.
- **Automate This Assay:** Validated automated methods available at: **www.promega.com/automethods/**

*A Phred score is a widely recognized method to measure the quality of DNA sequences. Phred is a base-calling program for DNA sequence traces available from Codoncode Corporation.

Storage Conditions: Store at 22–25°C.

Promega

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Nucleic Acid Quantitation and Analysis

Nucleic Acid Quantitation and Analysis

Helix

Products tagged with the Helix® icon are available for distribution through our convenient on-site stocking program in a freezer, refrigerated unit or an ambient cabinet.

For more information visit: **www.promega.com/helix**

Helix

Available in the Helix® on-site stocking system

DNA and RNA Quantitation

QuantiFluor® ONE dsDNA System

Product	Size	Cat.#
QuantiFluor® ONE dsDNA System	100 reactions	E4871
	500 reactions	E4870
Available Separately		
K562 Genomic DNA	80 µg	E4931
0.5ml PCR Tubes	50 pack	E4941
	200 pack	E4942

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The QuantiFluor® ONE dsDNA System contains a fluorescent double-stranded DNA-binding dye ($504nm_{Ex}/531nm_{Em}$) developed for use in an "add-and-read" format for dye and standard, making sample quantitation easy. This system enables sensitive quantitation of small amounts of double-stranded DNA (dsDNA).

The QuantiFluor® ONE dsDNA System was developed using the fluorescence module of the GloMax® Multi+ Detection System with Instinct® Software, GloMax® Discover System and the Quantus™ Fluorometer. The QuantiFluor® ONE dsDNA System can be used with any fluorometer that is capable of measuring fluorescence at the appropriate excitation and emission wavelengths.

Features:

- **Perform No Dilutions; Use No Extra Tubes:** Add-and-read format makes this dye simple to use.
- **Increase Your Sensitivity:** Significantly increased sensitivity compared to absorbance at 260nm (NanoDrop® spectrophotometer), allowing you to quantitate low-concentration samples with confidence.
- **Experience Minimal Binding:** Highly specific to dsDNA; minimal binding to ssDNA, RNA, protein and interfering compounds.
- **Take Advantage of Flexible Instrumentation:** Integrated on Quantus™ and GloMax® detection instruments, yet compatible with any fluorometer capable of measuring the appropriate fluorescence excitation and emission spectra.

Storage Conditions: Store the QuantiFluor® ONE dsDNA Dye and QuantiFluor® ONE Lambda DNA at –30°C to +10°C. Store the 1X TE Buffer at –30°C to +30°C.

QuantiFluor® dsDNA System

Product	Size	Cat.#
QuantiFluor® dsDNA System	1 ml	E2670
QuantiFluor® dsDNA Sample Kit	1 each	E2671
Available Separately		
0.5ml PCR Tubes	50 pack	E4941
	200 pack	E4942

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The QuantiFluor® dsDNA System contains a fluorescent DNA-binding dye that enables sensitive quantitation of small amounts of double-stranded DNA (dsDNA) in solution. The quantitation of dsDNA is a very important step in many biological applications, particularly in standard molecular biology techniques. The dye shows minimal binding to single-stranded DNA (ssDNA) and RNA, allowing specific quantitation of dsDNA.

Features:

- **Experience Minimal Binding:** Highly specific to dsDNA; minimal binding to ssDNA, RNA, protein and interfering compounds.
- **Increase Your Sensitivity:** Significantly increased sensitivity compared to absorbance at 260nm (NanoDrop® spectrophotometer) for low-concentration samples. Performs better or equal to PicoGreen® dye and can detect as little as 50pg/ml.
- **Set Up Quickly and Easily:** System includes all required reagents to quickly set up and quantitate dsDNA.
- **Use with Promega Instruments:** Pre-optimized on both the Quantus™ Fluorometer and GloMax®-Multi+ Instrument.
- **Use for Next-Gen Sequencing:** Successfully used in several Next-Gen Sequencing systems, including Illumina (HiSeq/miSeq), Roche (454) and LifeTech (ion Torrent and ion Proton) systems.

Storage Conditions: Product may arrive frozen. Upon receipt, store at 2–10°C.

QuantiFluor® ssDNA System

Product	Size	Cat.#
QuantiFluor® ssDNA System	1 ml	E3190
Available Separately		
0.5ml PCR Tubes	50 pack	E4941
	200 pack	E4942

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The QuantiFluor® ssDNA System contains a fluorescent dye that enables sensitive quantitation of small amounts of single-stranded (ssDNA) in solution. Detecting and quantitating ssDNA is useful for a variety of research interests in molecular biology. These include studying ssDNA viruses, quantitating short synthetic ssDNA probes for site-directed mutagenesis, analysis of first-strand cDNAs and quantitating bisulfite-converted DNA to study DNA methylation.

Features:

- **Increase Your Sensitivity:** Significantly increased sensitivity compared to absorbance at 260nm (NanoDrop® spectrophotometer) for low-concentration samples.
- **Save Precious Sample for Downstream Assays:** Less template DNA required than spectrophotometry.
- **Set Up Quickly and Easily:** System includes all required reagents to quickly set up and quantitate ssDNA.
- **Experience Flexible Instrument Compatibility:** Use easily on both the QuantiFluor® Fluorometer and GloMax®-Multi Instrument. This system also can be used on any fluorescent instrument with appropriate optical channels.
- **Remain Cost-Effective:** Value priced for those customers who are cost-conscious and budget-constrained.
- **Use with Promega Instruments:** Pre-optimized on both the Quantus™ Fluorometer and GloMax®-Multi+ Instrument.

Storage Conditions: Store at –30° to –10°C, protected from light.

QuantiFluor® RNA System

Product	Size	Cat.#
QuantiFluor® RNA System	1 ml	E3310
Available Separately		
0.5ml PCR Tubes	50 pack	E4941
	200 pack	E4942

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Sensitive quantitation of RNA is important for the success of downstream applications. The QuantiFluor® RNA System contains a fluorescent RNA-binding dye that enables sensitive quantitation of small amounts of RNA in solution. Detecting and quantitating small amounts of RNA is a very important step that is used in many biological applications, particularly in molecular biology techniques.

Features:

- **Increase Your Sensitivity:** Significantly increased sensitivity compared to absorbance results on the NanoDrop® spectrophotometer, allowing you to quantitate low-concentration samples with confidence.
- **Save Precious Sample for Downstream Assays:** Less template RNA required than for quantification by spectrophotometry.
- **Experience Flexible Instrument Compatibility:** Use easily on both the QuantiFluor®-ST Fluorometer and GloMax®-Multi Instrument. This system also can be used on any fluorescent instrument with appropriate optical channels.
- **Remain Cost-Effective:** Value priced, robust option for RNA quantitation.
- **Use with Promega Instruments:** Pre-optimized on both the Quantus™ Fluorometer and GloMax®-Multi+ Instrument.

Storage Conditions: Store at –30°C to –10°C, protected from light.

Available in the Helix® on-site stocking system

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Quantus™ Fluorometer

Product	Size	Cat.#
Quantus™ Fluorometer	1 each	E6150
Available Separately		
0.5ml PCR Tubes	50 pack	E4941
	200 pack	E4942
Quantus™ Instrument Standard Service Agreement	1 each	SA4040

E4941, E6150, E4942 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Quantus™ Fluorometer is a dual-channel fluorometer for your quantitation workflow. Designed to provide highly sensitive fluorescent detection when quantifying nucleic acids, the compact instrument is simple to operate. The Quantus™ Fluorometer is optimized with preprogrammed settings for Promega QuantiFluor® Dye Systems (QuantiFluor® dsDNA, RNA and ssDNA Systems) to quantitate nucleic acids and offers the flexibility to create customized methods and quantitation settings for other fluorescent dyes.

The Quantus™ Fluorometer is equipped with two fluorescence channels for nucleic acid and protein quantitation:

- Blue fluorescence channel: Excitation 495nm shortpass (wavelengths up to 495nm), emission 510–580nm.
- Red fluorescence channel: Excitation 640nm shortpass (wavelengths up to 640nm), emission 660–720nm.

Features:

- **Experience High Performance:** Integrated with QuantiFluor® Dyes for high sensitivity, broad dynamic range and target specificity. Great for low-level sample quantitation such as FFPE or viral samples.
- **Achieve Increased Sensitivity:** Significantly increased sensitivity over absorbance at 260nm (NanoDrop® spectrophotometer) for those samples that are low in concentration. Ten times more sensitive than Qubit® 2.0 and a detection limit of 50pg/ml, compared to 500pg/ml for the Qubit® 2.0. With a customized low standard curve, lower amounts can be detected.
- **Implement Easy-to-Use Workflow and Navigation:** Flexible with custom protocols and user-defined settings. PC software for data management workflow.
- **Easily Incorporate into Your Laboratory:** Affordable price is very cost-effective.
- **Use for Next-Gen Sequencing:** Successfully used in several Next-Gen Sequencing systems, including Illumina (HiSeq/miSeq), Roche (454) and LifeTech (ion Torrent and ion Proton) systems.

Quantus™ NGS Starter Package

Product	Size	Cat.#
Quantus™ NGS Starter Package	1 each	E5150

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Quantus™ NGS Starter Package provides you with highly sensitive and easy-to-use DNA quantitation for your NGS applications all in one discounted bundle. Contents include a Quantus™ Fluorometer (Cat.# E6150); QuantiFluor® ONE dsDNA System (Cat.# E4870) and enough 0.5ml assay tubes for 500 reactions.

The Quantus™ Fluorometer is a compact and easy-to-operate instrument designed for highly sensitive fluorescent detection of nucleic acids. The Quantus™ Fluorometer is optimized with preprogrammed settings for Promega QuantiFluor® Dye Systems (QuantiFluor® dsDNA, RNA, ssDNA Systems) for nucleic acid quantitation and offers flexibility to create customized methods and quantitation settings for other dyes.

The QuantiFluor® ONE dsDNA System provides a fluorescent double-stranded DNA-binding dye in an "add-and-read" format for both dye and standard, simplifying DNA quantitation and speeding up your workflow. It's as easy to use as NanoDrop® absorbance-based methods but much more sensitive for low-concentration samples.

Features:

- **Employ Integrated Instrumentation and Assay:** The QuantiFluor® dyes are optimized for high sensitivity, broad dynamic range and target specificity on the Quantus™ Fluorometer.
- **Measure Low dsDNA Concentrations:** Add-and-read format makes measuring low concentrations of dsDNA simple—no dilutions, no extra tubes.
- **Notice Increased Sensitivity:** Significantly increased sensitivity over absorbance at 260nm (NanoDrop spectrophotometer) for those samples that are low in concentration.
- **Expect High Specificity to dsDNA:** Minimal binding to ssDNA, RNA, protein and interfering compounds.
- **Spend Less Money:** Cost-effective to easily incorporate into your laboratory.
- **Use for Next-Gen Sequencing:** Successfully used in several NGS systems including Illumina (HiSeq/miSeq), Roche (454) and LifeTech (ion Torrent and ion Proton) systems.

Storage Conditions: Store QuantiFluor® ONE dsDNA Dye and QuantiFluor® ONE Lambda DNA at –30°C to +10°C. Store 1X TE Buffer at –30°C to +30°C.

Plexor® HY System

Product	Size	Cat.#
Plexor® HY System	200 reactions	DC1001
	800 reactions	DC1000
Available Separately		
Plexor® Calibration Kit, Set A	1 each	DC1500
Water, Amplification Grade	6,250 µl	DW0991
Not For Medical Diagnostic Use.		

Description: The Plexor® HY System is a real-time PCR assay to determine the concentration of total human DNA and male human DNA simultaneously in one reaction. The kit contains an internal PCR control (IPC) to test for false-negative results that may occur in the presence of PCR inhibitors and a melt curve function to confirm that the correct product was amplified.

Plexor® HY is a sensitive multiplex kit that routinely detects approximately 6.4pg of total DNA. PCR setup is performed at room temperature and is compatible with automated platforms.

The system works by measuring a reduction in fluorescent signal during amplification. Amplification of each target uses only two primers, one of which contains both a fluorescent tag and a modified base. As amplification proceeds, fluorescence is reduced by site-specific incorporation of a fluorescent quencher opposite the complementary modified base. The quencher is in close proximity to a fluorescent dye located on the end of the primer, resulting in a reduction of fluorescent signal. After PCR, a melt analysis can be performed to provide an internal control for the final assay design or to expedite troubleshooting.

The Plexor® HY System is optimized for use on the Applied Biosystems 7500 and 7500 FAST real-time PCR systems and Stratagene Mx3005P® and Mx3000P® qPCR systems. For information about use with other qPCR instrumentation, contact Promega Technical Services.

The Plexor® Analysis Software is available for free download. The unique functions of this software allow you to quickly and easily review data and create reports. Replicate samples are automatically averaged, template amounts are calculated and the necessary volume of DNA is displayed for your optimized STR amplification conditions.

Features:

- **Simultaneously Quantify Autosomal and Y-Chromosome DNA:** Less variability, less time, more valuable data.
- **Consistently and Reproducibly Detect 6.4pg of DNA:** If you can't detect it with Plexor® HY, you can't detect it with your STR system.
- **Be Confident in Your Data:** Internal positive control and melt-curve analysis guard against false-negative and false-positive results.

Storage Conditions: Store at –20°C.

RNA Markers

Product	Size	Cat.#
RNA Markers	50 µl	G3191
For Research Use Only. Not for Use in Diagnostic Procedures.		

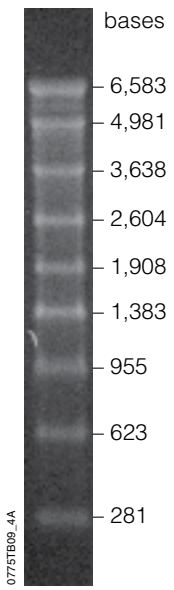
Description: Promega RNA Markers are suitable for size estimation of single-stranded RNA from 0.28–6.58kb in glyoxal or formaldehyde-agarose gels. The RNA Markers consist of a ladder of nine RNA transcripts that are synthesized in vitro from specific templates. The sizes are 281, 623, 955, 1,383, 1,908, 2,604, 3,638, 4,981 and 6,583 bases. The markers are not intended for use in quantitative analysis. After electrophoresis, the fragments can be visualized by ethidium bromide staining.

Recommended Loading: 3µl (prepared in formaldehyde/MOPS buffer and separated onto a 1% formaldehyde-agarose gel using MOPS running buffer).

Features:

- **Range (bases):** 281–6,583.
- **Number of Bands:** 9.

Storage Conditions: Store at –70°C.



1% formaldehyde-agarose

Available in the Helix® on-site stocking system

In Vitro Transcription

RiboMAX™ Large Scale RNA Production Systems

Product	Size	Cat.#
RiboMAX™ Large Scale RNA Production System—SP6	1 system	P1280
RiboMAX™ Large Scale RNA Production System—T7	1 system	P1300

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The RiboMAX™ Large Scale RNA Production Systems consistently produce 2–5mg/ml of RNA in a 1ml reaction, about 10- to 20-fold more RNA than is produced with the standard Riboprobe® System transcription reaction. The RiboMAX™ System reactions differ from those of the Riboprobe® Systems in three primary ways: a HEPES (pH 7.5) buffer is used rather than a Tris-HCl (pH 7.9) buffer; rNTP and magnesium concentrations are elevated at levels appropriate for either SP6 or T7 RNA polymerase; and inorganic pyrophosphatase is included in the reaction.

RNAs synthesized with the RiboMAX™ System perform better for in vitro translation in rabbit reticulocyte translation systems than RNA synthesized by standard methods. The reduction of components inhibitory to translation may be advantageous for other applications requiring biologically active RNA. Because the RiboMAX™ Systems produce large quantities of RNA, these systems are not recommended for the generation of high-specific-activity RNA probes.

Note: Use of the RiboMAX™ System for production of capped transcripts requires separate purchase of the Ribo m^7G Cap Analog (Cat. P1711).

Features:

- **Flexible:** Systems are available for use with SP6 and T7 RNA polymerases.
- **Scalable:** Reactions can be scaled up or down to suit varying RNA production requirements.
- **High-Quality:** Synthesis of enhanced, translation-grade RNA.

Storage Conditions: Store at –20°C.

T7 RiboMAX™ Express Large Scale RNA Production System

Product	Size	Cat.#
T7 RiboMAX™ Express Large Scale RNA Production System	1 system	P1320

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The T7 RiboMAX™ Express Large Scale RNA Production System is an in vitro transcription system designed for the consistent production of milligram amounts of RNA in a short amount of time. Due to optimization of the enzyme mix and transcription buffer, yields of 5–8.5mg/ml are generated in 30 minutes, compared to 2–4 hours with other commercially available systems. To minimize pipetting steps and errors, the 2X transcription buffer includes all four rNTPs. In addition, the system includes RQ1 RNase-Free DNase for the removal of plasmid template after transcription.

Due to the combined 2X buffer and rNTPs, the T7 RiboMAX™ Express System is not recommended for the synthesis of RNA for applications that require capped RNA. For synthesis of capped RNA, please order the standard RiboMAX™ Large Scale RNA Production System—T7 (Cat.# P1300).

Features:

- **Fast:** The T7 RiboMAX™ Express System produces milligram amounts of RNA in as little as 30 minutes rather than 2–4 hours as with other commercially available systems.
- **Convenient:** The four rNTPs and 2X transcription buffer have been combined, thus minimizing pipetting errors and setup time.
- **Flexible:** Efficiently transcribes DNA templates of varying sizes. Works with transcripts as short as 21bp.

Storage Conditions: Store at –20°C.

Riboprobe® Systems

Product	Size	Cat.#
Riboprobe® System—SP6	1 system	P1420
Riboprobe® System—T3	1 system	P1430
Riboprobe® System—T7	1 system	P1440

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Riboprobe® Systems are designed for in vitro preparation of high-specific-activity single-stranded RNA probes or microgram quantities of defined RNA transcripts from cloned DNA inserts. These systems contain all components necessary for in vitro transcription from a DNA template (excluding the radioisotope) and also contain RQ1 RNase-Free DNase (Cat.# M6101) for template removal following transcription.

Features:

- **Specific:** SP6, T7 and T3 RNA Polymerases are extremely promoter-specific, allowing production of virtually homogeneous RNA using plasmid DNA as a template.
- **Choice of Enzyme:** Systems available with SP6 RNA Polymerase, T7 RNA Polymerase or T3 RNA Polymerase.
- **Convenient:** Includes positive control template for use with SP6, T7 or T3 RNA Polymerase, DNase I for removal of DNA template and Recombinant RNasin® Ribonuclease Inhibitor.

Storage Conditions: Store at –20°C.

Riboprobe® Combination Systems

Product	Size	Cat.#
Riboprobe® Combination System—T3/T7 RNA Polymerase	1 system	P1450
Riboprobe® Combination System—SP6/T7 RNA Polymerase	1 system	P1460

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Riboprobe® Combination Systems are designed for in vitro preparation of high-specific-activity single-stranded RNA probes or microgram quantities of defined RNA transcripts from cloned DNA inserts. The Riboprobe® Combination Systems include the RNA polymerases, all of the required reagents (excluding radioisotope) for performing transcription reactions in vitro and RQ1 RNase-Free DNase (Cat.# M6101) for removal of the template following transcription.

Features:

- **Flexible:** Allows synthesis of RNA corresponding to either the coding or noncoding strand of cloned DNA from a single plasmid construct.
- **Specific:** SP6, T7 and T3 RNA Polymerases are extremely promoter-specific, allowing production of virtually homogeneous RNA using plasmid DNA as a template.
- **Convenient:** Includes positive control template for use with T7, T3 or SP6 RNA polymerase, DNase I for removal of DNA template and Recombinant RNasin® Ribonuclease Inhibitor.

Storage Conditions: Store at –20°C.

Riboprobe® System Components and Buffers

Product	Size	Conc.	Cat.#
Riboprobe® System Buffers	1 system		P1121
rATP, rCTP, rGTP, rUTP, each at 10mM in separate tubes	0.5 ml		P1221
Available Separately			
RQ1 RNase-Free DNase	1,000 u	1 u/µl	M6101
rATP, 10mM	0.5 ml		P1132
rCTP, 10mM	0.5 ml		P1142
rGTP, 10mM	0.5 ml		P1152
rUTP, 10mM	0.5 ml		P1162
DTT, Molecular Grade	100 µl	100 mM	P1171
Transcription Optimized 5X Buffer	200 µl		P1181
Nuclease-Free Water	50 ml		P1193

M6101, P1132, P1221, P1142, P1152, P1162, P1171, P1193 For Laboratory Use.
P1121, P1181 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Riboprobe® System Buffers are components of the single and combination Riboprobe® Systems. The buffers are also available as standalone products.

RQ1 RNase-Free DNase is used to remove template DNA from RNA preparations and is qualified for use in applications where maintaining the integrity of RNA is critical. Product is quality tested to ensure the absence of detectable RNase activity. 10X Reaction Buffer and 10X Stop Buffer included.

rATP, rCTP, rGTP and rUTP are provided in individual tubes, qualified for use with the Riboprobe® Systems. The rNTPs are supplied in nuclease-free water. Purity has been verified by HPLC analysis.

Features:

- **Pretested:** Reagents are tested with other Riboprobe® System components. rNTPs are tested for functionality with in vitro transcription reactions.
- **Transcription Qualified:** Reagents are qualified for use for in vitro transcription reactions with SP6, T7 or T3 RNA Polymerase.

Storage Conditions: Store at –20°C.

Ribo m^{7}G Cap Analog

Product	Size	Conc.	Cat.#
Ribo m^{7}G Cap Analog	10 A_{254} units	40 mM	P1711
	25 A_{254} units	40 mM	P1712

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Ribo m^{7}G Cap Analog is a modified ribonucleotide with the structure (m^{7}G(5′)ppp(5′)G). This methylated ribonucleotide can be incorporated onto the 5′-end of transcripts synthesized in vitro and simulates the 7-methyl guanosine 5′-cap structure found on most eukaryotic mRNA molecules.

Features:

- **Improved Translation:** Enhances translation efficiency in many reticulocyte-based reactions.
- **Effective:** Protects RNA from intracellular digestion.
- **Flexible:** Can be used in either the Riboprobe® Systems or RiboMAX™ Large Scale RNA Production Systems.

Storage Conditions: Store at –20°C.

pGEM® Express Positive Control Template

Product	Size	Cat.#
pGEM® Express Positive Control Template	10 µg	P2561

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The pGEM® Express Positive Control Template is created by linearizing a vector with the restriction enzyme ScaI. The Positive Control Template may be used to monitor in vitro transcription reactions when using the Riboprobe® Systems.

Features:

- **Multi-Sized RNAs:** SP6 RNA polymerase produces transcripts of 1,787 and 2,566 bases; T7 RNA polymerase produces transcripts of 1,065 and 2,346 bases; T3 RNA Polymerase produces transcripts of 250 and 1,525 bases.
- **Flexible:** Template can be used with SP6, T7 or T3 RNA polymerases.

Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system

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Transcription Factor Consensus Oligonucleotides

Product	Size	Conc.	Cat.#
AP1 Consensus Oligonucleotide	175 pmol	1.75 pmol/µl	E3201
	35 pmol	1.75 pmol/µl	E3202
AP2 Consensus Oligonucleotide	175 pmol	1.75 pmol/µl	E3211
	35 pmol	1.75 pmol/µl	E3212
CREB Consensus Oligonucleotide	175 pmol	1.75 pmol/µl	E3281
	35 pmol	1.75 pmol/µl	E3282
NF-κB Consensus Oligonucleotide	175 pmol	1.75 pmol/µl	E3291
	35 pmol	1.75 pmol/µl	E3292
OCT1 Consensus Oligonucleotide	175 pmol	1.75 pmol/µl	E3241
	35 pmol	1.75 pmol/µl	E3242
SP1 Consensus Oligonucleotide	175 pmol	1.75 pmol/µl	E3231
	35 pmol	1.75 pmol/µl	E3232
TFIID Consensus Oligonucleotide	175 pmol	1.75 pmol/µl	E3221
	35 pmol	1.75 pmol/µl	E3222

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The electrophoretic mobility shift assay (EMSA, gel shift, gel retardation) is a relatively simple and sensitive method to investigate protein:DNA interactions. These oligonucleotides contain consensus DNA-binding sites for individual sequence-specific transcription factors. The double-stranded oligonucleotides are designed with 5′ OH blunt ends, making them easily labeled to high specific activity with T4 polynucleotide kinase.

Storage Conditions: Store at –20°C.

Characteristics of the Consensus Oligonucleotides and Binding Proteins.

AP1 (c-jun) 5′-CGC TTG ATG AGT CAG CCG GAA-3′
3′-GCG AAC TAC TCA GTC GGC CTT-5′

Forms DNA binding dimers with other members of the AP1 family and with Fos through leucine zipper formation.

AP2 5′-GAT CGA ACT GAC CGC CCG CGG CCC GT-3′
3′-CTA GCT TGA CTG GCG GGC GCC GGG CA-5′

May act independently as both a TPA- and cAMP-inducible element and can be specifically inhibited by large T antigen.

CREB 5′-AGA GAT TGC CTG ACG TCA GAG AGC TAG-3′
3′-TCT CTA ACG GAC TGC AGT CTC TCG ATC-5′

Confers responsiveness to cAMP; it contains a leucine zipper motif for dimerization, and the associated basic domain is homologous to c-Jun DNA binding domains.

NF-κB 5′-AGT TGA GGG GAC TTT CCC AGG C-3′
3′-TCA ACT CCC CTG AAA GGG TCC G-5′

Binds to κ light chain enhancer in B cells and is present in a covert cytoplasmic form in non-B cells.

OCT1 5′-TGT CGA ATG CAA ATC ACT AGA A-3′
3′-ACA GCT TAC GTT TAG TGA TCT T-5′

A member of the OCT family, which is apparently ubiquitous in mammalian cells, the bipartite POU domain includes the POU-box and the homeo domain.

SP1 5′-ATT CGA TCG GGG CGG GGC GAG C-3′
3′-TAA GCT AGC CCC GCC CCG CTC G-5′

O-glycosylated transcription factor with sequence specificity conferred through three zinc fingers in the DNA binding domain.

TFIID 5′-GCA GAG CAT ATA AGG TGA GGT AGG A-3′
3′-CGT CTC GTA TAT TCC ACT CCA TCC T-5′

A general transcription factor that exhibits specific DNA binding to the TATA box. This factor is associated with RNA polymerase I, II and III activities.

9491LA

HeLaScribe® Nuclear Extract in vitro Transcription System

Product	Size	Cat.#
HeLaScribe® Nuclear Extract in vitro Transcription System	40 reactions	E3110

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The most well characterized cell-free system for in vitro transcription of eukaryotic genes is derived from HeLa cell nuclei. HeLa nuclear extracts can support accurate transcription initiation by RNA polymerase II and exhibit both basal and regulated patterns of RNA polymerase transcription. The nuclear extract is also a source for a variety of transcription factors, DNA-binding proteins and the enzymatic machinery involved in RNA processing.

The HeLa Nuclear Extract included in the HeLaScribe® Nuclear Extract in vitro Transcription System is prepared by a modification of the method of Dignam et al. Extracts prepared by this method have been shown to allow transcription from the human transferrin gene promoter and the adenovirus 2 major late promoter. The system also includes all of the necessary components for in vitro transcription as well as a positive control template (CMV immediate early promoter DNA).

Features:

- **Performance-Tested:** Tested with cytomegalovirus immediate early gene (CMV) promoter.
- **Convenient:** Available as a complete transcription system or extract alone.
- **Positive Control:** System contains a CMV promoter-positive control template.

Storage Conditions: Store at –70°C. Avoid multiple freeze-thaw cycles of the extract.

In Vitro Transcription Systems Related Products

Product	Size	Cat.#
HeLaScribe® Nuclear Extract in vitro Transcription Grade	40 reactions	E3091
	160 reactions	E3092
HeLaScribe® Nuclear Extract Positive Control DNA	300 ng	E3621
rCTP, rATP, rUTP, rGTP, 100mM each	4 × 400 µl	E6000
rATP, 100mM	400 µl	E6011
rUTP, 100mM	400 µl	E6021
rGTP, 100mM	400 µl	E6031
rCTP, 100mM	400 µl	E6041

E3091, E3092, E3621 For Research Use Only. Not for Use in Diagnostic Procedures.
E6000, E6011, E6021, E6031, E6041 For Laboratory Use.

Description: HeLaScribe® Nuclear Extract, in vitro Transcription Grade, derived from HeLa cell nuclei, provides a cell-free system for in vitro transcription of eukaryotic genes.

Storage Conditions: Store HeLaScribe® Nuclear Extract and Positive Control DNA at –70°C. Store other components at –20°C.

Primer Extension System—AMV Reverse Transcriptase

Product	Size	Cat.#
Primer Extension System—AMV Reverse Transcriptase	40 reactions	E3030

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Primer Extension System—AMV Reverse Transcriptase can be used to quantitate specific mRNA transcripts and map the start sites of transcription. An end-labeled oligonucleotide is hybridized to RNA and is used as a primer by reverse transcriptase in the presence of deoxynucleotides. The RNA is thus reverse transcribed into cDNA and is analyzed on a denaturing polyacrylamide gel. The length of the cDNA reflects the number of bases between the labeled nucleotide of the primer and the 5′-end of the RNA; the quantity of cDNA product is related to the amount of targeted RNA.

Features:

- **Convenient:** System includes control RNA and primer as well as size markers ready for phosphorylation with T4 Polynucleotide Kinase.

Storage Conditions: All components must be stored at –20°C, except for the control RNA, which must be stored at –70°C.

Gel Shift Assay Systems

Product	Size	Cat.#
Gel Shift Assay Core System	100 reactions	E3050
Gel Shift Assay System	100 reactions	E3300
Available Separately		
HeLaScribe® Nuclear Extract, Gel Shift Assay Grade	3 × 40 µl	E3521
Gel Shift Binding 5X Buffer	5 × 200 µl	E3581

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The gel shift or electrophoretic mobility shift assay provides a simple and rapid method for detecting DNA-binding proteins. This method is widely used to study sequence-specific DNA-binding proteins such as transcription factors. The assay is based on the observation that complexes of protein and DNA migrate through a nondenaturing polyacrylamide gel more slowly than free DNA fragments or double-stranded oligonucleotides. The gel shift assay is performed by incubating a purified protein or a complex mixture of proteins (such as nuclear or cell extract preparations) with a ^{32}P end-labeled DNA fragment containing the putative protein binding site. The reaction products are then analyzed on a nondenaturing polyacrylamide gel. The specificity of the DNA-binding protein for the putative binding site is established by competition experiments using unlabeled DNA fragments or oligonucleotides containing a binding site for the protein of interest or other unrelated DNA sequences.

The Core System (Cat.# E3050) includes HeLa Nuclear Extract and SP1 and AP2 Consensus Oligos that can be used as positive controls and serve as a reliable system for obtaining experience with gel shift assays. In addition, the Core System contains T4 Polynucleotide Kinase and Kinase 10X Buffer for labeling oligonucleotides as well as Gel Shift Binding 5X Buffer. Cat.# E3300 contains all of the above plus consensus oligos for AP1, OCT1, CREB, NF-κB, and TFIID.

Features:

- **Positive Controls:** The Gel Shift Assay Core System includes a HeLa Nuclear Extract and consensus oligonucleotides for AP2 and SP1.
- **Versatile:** Oligonucleotides can be 5′ end-labeled and used as protein-specific probes or used as unlabeled oligonucleotides in competition assays.

Storage Conditions: Store HeLa Nuclear Extract at –70°C. Store other components at –20°C.

RNA Interference

RNasin® Ribonuclease Inhibitors

Product	Size	Conc.	Cat.#
RNasin® Ribonuclease Inhibitor	2,500 u	20–40 u/µl	N2111
	10,000 u	20–40 u/µl	N2115
Recombinant RNasin® Ribonuclease Inhibitor	2,500 u	20–40 u/µl	N2511
	10,000 u	20–40 u/µl	N2515
RNasin® Plus RNase Inhibitor	2,500 u	40 u/µl	N2611
	10,000 u	40 u/µl	N2615

N2111, N2115 For Research Use Only. Not for Use in Diagnostic Procedures. N2511, N2515, N2611, N2615 For Laboratory Use.

Description: RNases are ubiquitous and can cause RNA degradation and compromise RNA integrity. Native and Recombinant RNasin® Inhibitors are 50kDa proteins that inhibit RNase A family and human placental RNases by noncovalently binding to RNases in a 1:1 ratio. For downstream applications such as GoScript™ Reverse Transcriptase, AMV/M-MLV reverse transcriptases, SP6, T7/T3 RNA polymerase, and *Taq* DNA polymerases, Recombinant RNasin® Inhibitor does not inhibit RNase T1, S1 nuclease, RNase from *Aspergillus*, RNase H, RNase ONE™ Ribonuclease and enzymes.

RNasin® Plus RNase Inhibitor is a recombinant mammalian RNase inhibitor that is expressed as a soluble protein in *E. coli*, allowing easy purification through a combination of ion exchange and hydrophobic interaction chromatography. The protein is capable of inhibiting eukaryotic RNases (e.g., RNase A and RNase B) similarly to human placental RNase inhibitor. RNasin® Plus RNase Inhibitor is tested in RT-PCR and compatible with enzymes such as AMV, M-MLV and ImProm-II™ Reverse Transcriptases or *Taq* and *Tfl* DNA Polymerases. RNasin® Plus RNase Inhibitor also is tested and compatible with quantitative, real-time RT-PCR in a TaqMan® assay.

RNasin® Plus RNase Inhibitor offers increased resistance to oxidation over the human version of the protein. Two cysteines in the human protein have been identified as especially sensitive to oxidation and react by forming a disulfide bond that can block the active site of the inhibitor. RNasin® Plus, through natural amino acid diversity, lacks the ability to form this site-blocking disulfide. In addition, the new protein has characteristics never before realized, including continued inhibition of RNases above 50°C. Heating solutions of RNasin® Plus and RNase followed by cooling does not result in the reappearance of RNase activity—even when the solution is heated above the denaturation temperature of the RNasin® Plus protein alone. This allows RNasin® Plus to protect RNA species prior to, during and after heating, even at temperatures normally used during first-strand DNA synthesis in RT-PCR. Solutions heated up to 70°C for 15 minutes did not result in RNase reactivation.

Available in the Helix® on-site stocking system
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Features:

- **Achieve Broad-Spectrum RNase Inhibition:** Inhibits common eukaryotic RNases.
- **Use with Many Enzymes:** Does not inhibit SP6, T7 or T3 RNA Polymerase; GoScript™ Reverse Transcriptase, AMV or M-MLV Reverse Transcriptase; or *Taq* DNA polymerase.
- **Use in Many Downstream Assays:** Functional across wide pH range (pH 5–8).
- **Choose Native or Recombinant Form:** Recombinant form is made in bacteria, minimizing the chances of human nucleic acid contamination.

RNasin® Plus RNase Inhibitor also can:

- **Improve Resistance to Oxidation:** Due to natural amino acid diversity, RNasin® Plus lacks the capability to form the active site-blocking disulfide bond that can form in the human protein under oxidative conditions.
- **Improve Purification:** RNasin® Plus is expressed by *E. coli* as a soluble protein, allowing easy purification by a combination of ion exchange and hydrophobic interaction chromatography. No direct affinity chromatography required. The new process yields a >90% pure protein with no *E. coli* RNase carryover.
- **Use with RT-PCR Systems:** RNasin® Plus has proven compatible with the Access and AccessQuick™ RT-PCR Systems, M-MLV Reverse Transcriptase, ImProm-II™ Reverse Transcription System and the GoScript™ Reverse Transcription System. Also proven compatible with TaqMan®-based RT-PCR Systems.
- **Protect During RNA Template Denaturation:** Heating mixtures of RNasin® Plus RNase Inhibitor and RNase does not lead to reactivation of the RNase at temperatures even as high as 70°C for 15 minutes. Many RT-PCR protocols call for RNA template denaturation (e.g., 65–70°C for 5–10 minutes) in the presence of the RT primers prior to full RT reaction assembly for maximum sensitivity. You can now include RNasin® Plus at this step.
- **Protect During Higher Temperature RT Reactions:** Add RNasin® Plus RNase Inhibitor during RT reaction assembly and take the reaction to temperatures above 50°C with enzymes like the ImProm-II™ and AMV Reverse Transcriptases. RNases that may be present will not be reactivated at the higher temperature.

Storage Conditions: Store at –20°C.

T7 RiboMAX™ Express RNAi System

Product	Size	Cat.#
T7 RiboMAX™ Express RNAi System	50 × 20µl reactions	P1700

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The T7 RiboMAX™ Express RNAi System is an in vitro transcription system designed for producing milligram amounts of double-stranded RNA (dsRNA) in a short amount of time. The dsRNA is free of protein and other contaminants and is suitable for use in RNA interference (RNAi) in both mammalian and nonmammalian systems.

The T7 RiboMAX™ Express RNAi System can be used to synthesize short interfering RNAs (siRNAs) of 21bp for use in mammalian systems. siRNAs synthesized in vitro have been demonstrated to be as effective as chemically synthesized siRNAs for inducing RNAi in mammalian cells.

In addition, the T7 RiboMAX™ Express RNAi System can be used for the synthesis of dsRNA molecules of approximately 200bp or greater, which can be applied to nonmammalian systems. Two complementary RNA strands are synthesized from DNA template (either plasmid or PCR product). The resulting RNA strands are annealed after the transcription reaction to form dsRNA. Any remaining single-stranded RNA and DNA template are removed with a nuclease digestion step. The dsRNA is then purified by isopropanol precipitation and can be introduced into the organism of choice for RNAi applications.

Features:

- **Save Time:** The T7 RiboMAX™ Express RNAi System produces milligram amounts of RNA in as little as 30 minutes.
- **Minimize Pipetting Errors:** The four rNTPs and 2X transcription buffer have been combined, thus minimizing pipetting errors and setup time.

Storage Conditions: Store all components at –20°C, except RNase A, which should be stored at 22–25°C after the initial thaw.

psiCHECK™-2 Vector

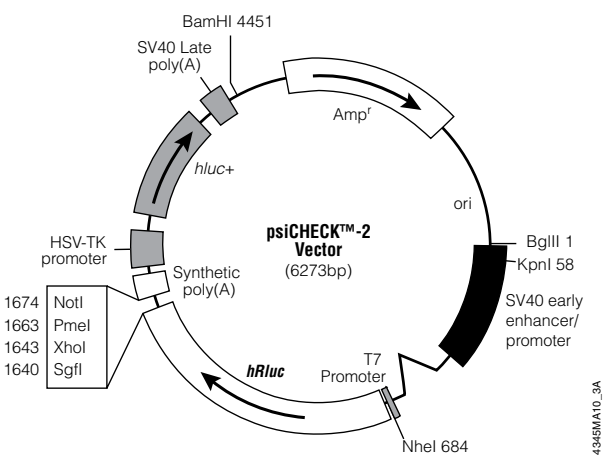
Product	Size	Cat.#
psiCHECK™-2 Vector	20 µg	C8021
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The psiCHECK™-2 Vector is designed to provide a quantitative and rapid approach for initial optimization of RNA interference (RNAi). The vector enables monitoring of changes in expression of a target gene fused to a reporter gene. *Renilla* luciferase is used as the primary reporter gene, and the gene of interest is cloned into a multiple cloning region located downstream of the *Renilla* translational stop codon. Initiation of the RNAi process by synthetic siRNAs or in vivo-expressed shRNAs toward a gene of interest results in cleavage and subsequent degradation of the fusion mRNA. Measuring decreases in *Renilla* activity provides a convenient way of monitoring the RNAi effect. In comparison with other fusion approaches (e.g., GFP or flag-tags), the *Renilla* luciferase approach offers more convenient and rapid quantitation with higher sensitivity. The psiCHECK™-2 Vector contains a second reporter gene, firefly luciferase, and is designed for endpoint lytic assays. Introduction of firefly luciferase in the psiCHECK™-2 Vector allows normalization of *Renilla* luciferase expression, achieving robust and reproducible results.

Features:

- **Save Money:** Quantitation is performed with a common luminometer; no need to purchase expensive equipment.
- **Save Time:** No requirement for labor-intensive, time-consuming assays or waiting for phenotypic changes.
- **Convenient:** No requirement for transfection normalization when using the psiCHECK™-2 Vector.

Storage Conditions: Store at –20°C.



RT-PCR and RT-qPCR

GoTaq® Real-Time qPCR and RT-qPCR Systems for Probe-Based Detection

Product	Size	Cat.#
GoTaq® Probe qPCR Master Mix	2 ml	A6101
	10 ml	A6102
GoTaq® Probe 2-Step RT-qPCR System	2 ml	A6110
GoTaq® Probe 1-Step RT-qPCR System	2 ml	A6120
	12.5 ml	A6121
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The GoTaq® Probe qPCR Master Mix is optimized for quantitative PCR assays in the hydrolysis probe detection format. The master mix is provided as a ready-to-use, stabilized 2X formulation that includes all components for qPCR (except template, primers and probe). This master mix does not contain a reference dye; however, a separate tube of carboxy-X-rhodamine (CXR) reference dye is included with this system, allowing users to add reference dye to amplification reactions if desired.

The GoTaq® Probe qPCR Master Mix provides resistance to a wide range of PCR inhibitors. This formulation uses antibody-mediated hot-start chemistry, allowing reaction setup to be performed at room temperature. The master mix also employs rapid hot-start activation and processive enzymes, making it compatible with both standard and fast instrument cycling programs.

The GoTaq® Probe 2-Step RT-qPCR System is optimized for quantitative PCR assays in the hydrolysis probe detection format. The system facilitates detection and relative quantification of RNA expression levels via a two-step RT-qPCR method using integrated components:

- GoScript™ Reverse Transcription System
- GoTaq® Probe qPCR Master Mix

The GoScript™ Reverse Transcription System includes an optimized reaction buffer and reverse transcriptase that enable efficient synthesis of first-strand cDNA in preparation for PCR amplification. The cDNA product may be added directly to downstream qPCR amplification reactions.

The GoTaq® Probe 1-Step RT-qPCR System is optimized for quantitative PCR assays in the hydrolysis probe detection format. The system enables detection and relative quantification of RNA expression levels using a one-step RT-qPCR method, combining GoScript™ Reverse Transcriptase and GoTaq® Probe qPCR Master Mix in single-step real-time amplification reactions.

The GoScript™ RT Mix for 1-Step RT-qPCR (50X) combines optimized amounts of GoScript™ Reverse Transcriptase, RNasin® Plus RNase Inhibitor, dUTP and additives to enhance single-step reactions.

Features:

- **Superior Performance:** Sensitive detection on any real-time instrument.
- **Enhanced Stability:** Room-temperature setup makes the system suitable for automation and high-throughput detection.
- **Versatility:** Compatible with both fast and standard cycling methods.
- **Performance Guarantee:** Promega PCR systems, enzymes and reagents are proven in PCR to ensure reliable, high-performance results. If you are not completely satisfied with any Promega PCR product, we will send a replacement or refund your account.

Storage Conditions: Store all components between –30°C and –10°C. Protect components from light at all times. For best results, mix thawed solutions gently to minimize aeration and foaming, and keep on ice. For short-term storage and frequent use, the GoTaq® qPCR Master Mix, 2X, may be kept at 2–8°C for up to 3 months if protected from light.

Available in the Helix® on-site stocking system

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GoTaq® Real-Time qPCR and RT-qPCR Systems for Dye-Based Detection

Product	Size	Cat.#
GoTaq® qPCR Master Mix	5 ml	A6001
	25 ml	A6002
GoTaq® 2-Step RT-qPCR System	5 ml	A6010
GoTaq® 1-Step RT-qPCR System	5 ml	A6020
Available Separately		
CXR Reference Dye	100 µl	C5411

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The GoTaq® qPCR Master Mix is a ready-to-use 2X master mix for use in real-time quantitative PCR (qPCR and RT-qPCR). The system contains BRYT Green® Dye, a novel fluorescent DNA-binding dye with minimal PCR inhibition for maximum PCR efficiency and greater fluorescence enhancement upon binding to double-stranded DNA than SYBR® Green I. Containing the GoTaq® Hot Start Polymerase, optimized buffer and proprietary dye, the GoTaq® qPCR Master Mix provides robust real-time PCR with earlier quantification cycle values and broad-range detection for increased reliability, reproducibility and sensitivity.

The GoTaq® 2-Step RT-qPCR System is a reagent system for quantitative analysis of RNA using a two-step reverse transcription-quantitative PCR (RT-qPCR) protocol. The components and protocol allow robust, reliable cDNA synthesis of a full range of rare and abundant transcripts, even in the presence of inhibitors, using the GoScript™ Reverse Transcription System and quantification using the GoTaq® qPCR Master Mix.

The GoTaq® 1-Step RT-qPCR System is a reagent system for quantitative analysis of RNA using a one-step reverse transcription-quantitative PCR (RT-qPCR) protocol in a single tube. The BRYT Green® Dye and optimized buffer formulations improve data accuracy and sensitivity of low-level targets.

Features:

- **Brighter Signal:** Sensitive detection for earlier quantification of low- and high-copy-number targets.
- **Enhanced Stability:** Room-temperature setup makes the systems suitable for automation and high-throughput detection.
- **Versatility:** Compatible with both fast and standard qPCR cycling methods.
- **Robustness:** High-efficiency, full-length cDNA synthesis in the presence of inhibitors.
- **Performance Guarantee:** Promega PCR systems, enzymes and reagents are proven in PCR to ensure reliable, high-performance results. If you are not completely satisfied with any Promega PCR product, we will send a replacement or refund your account.

Storage Conditions: Upon arrival, store all components at –30°C to –10°C, protected from light. For immediate use, components may be stored at 2–8°C, protected from light, for up to 3 months.

M-MLV Reverse Transcriptase

Product	Size	Conc.	Cat.#
M-MLV Reverse Transcriptase	10,000 u	200 u/µl	M1701
	50,000 u	200 u/µl	M1705
M-MLV Reverse Transcriptase Buffer Pack	2 × 1 ml		M5313

For Laboratory Use.

Description: Moloney Murine Leukemia Virus Reverse Transcriptase (M-MLV RT) is an RNA-dependent DNA polymerase that can be used in cDNA synthesis with long messenger RNA templates (>5kb). The enzyme is a product of the *pol* gene of M-MLV and consists of a single subunit with a molecular weight of 71kDa. The RNase H activity of M-MLV RT is weaker than that of the commonly used Avian Myeloblastosis Virus (AMV) reverse transcriptase.

Features:

- **Provided with 5X Reaction Buffer:** 250mM Tris-HCl (pH 8.3 at 25°C), 375mM KCl, 15mM $MgCl_2$, 50mM DTT.
- **Heat-Inactivated:** M-MLV RT is inactivated by heating at 70°C for 10 minutes.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –20°C.

M-MLV Reverse Transcriptase, RNase H Minus

Product	Size	Conc.	Cat.#
M-MLV Reverse Transcriptase, RNase H Minus	10,000 u	100–200 u/µl	M5301

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Moloney Murine Leukemia Virus Reverse Transcriptase, RNase H Minus (M-MLV RT [H–]), is an RNA-dependent DNA polymerase that can be used in cDNA synthesis with long messenger RNA templates (>5kb). This form of M-MLV Reverse Transcriptase is genetically altered to remove the associated RNase H activity. Although many researchers are successful in using M-MLV RT (H+) for analytical and some preparative cDNA applications, reverse transcriptases lacking RNase H activity provide another option to prepare long cDNAs and libraries containing a high percentage of full-length cDNA.

Features:

- **RNase H Minus:** Provides optimal conditions to prepare full-length cDNA from long RNA templates.
- **Provided with 5X Reaction Buffer:** 250mM Tris-HCl (pH 8.3 at 25°C), 375mM KCl, 15mM $MgCl_2$, 50mM DTT.
- **Heat-Inactivated:** M-MLV RT is inactivated by heating at 70°C for 10 minutes.

Storage Conditions: Store at –20°C.

M-MLV Reverse Transcriptase, RNase H Minus, Point Mutant

Product	Size	Cat.#
M-MLV Reverse Transcriptase, RNase H Minus, Point Mutant	2,500 u	M3681
	10,000 u	M3682
	50,000 u	M3683

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Moloney Murine Leukemia Virus Reverse Transcriptase, RNase H Minus (M-MLV RT [H–]), Point Mutant, is an RNA-dependent DNA polymerase that can be used for cDNA synthesis with long RNA templates (>5kb). The lack of RNase H activity is beneficial for this application, as RNase H can start to degrade templates when incubation times are long, as they may be when synthesizing long cDNAs. Although many researchers are successful in using M-MLV RT (H+) for analytical and some preparative cDNA applications, reverse transcriptases lacking RNase H activity provide another option to prepare long cDNAs and libraries containing a high percentage of full-length cDNA.

Features:

- **RNase H Minus:** Provides optimal conditions to prepare full-length cDNA from long RNA templates.
- **Temperature Stability:** Thermostability of this point mutant minimizes problems associated with RNA secondary structure.
- **Increased Polymerase Activity:** M-MLV RT (H–), Point Mutant, gives higher yields of cDNA compared with the deletion mutant (Cat.# M5301).
- **Provided with 5X Reaction Buffer:** 250mM Tris-HCl (pH 8.3 at 25°C), 375mM KCl, 15mM $MgCl_2$, 50mM DTT.
- **Broad Working Range:** More tolerance to variations in enzyme and substrate concentrations means improved consistency in performance.

Storage Conditions: Store at –20°C.

AMV Reverse Transcriptase

Product	Size	Conc.	Cat.#
AMV Reverse Transcriptase	300 u	10 u/µl	M5101
	1,000 u	10 u/µl	M5108
AMV Reverse Transcriptase (HC)	600 u	20–25 u/µl	M9004

For Laboratory Use.

Description: Avian Myeloblastosis Virus Reverse Transcriptase (AMV RT) catalyzes DNA polymerization using template DNA, RNA or RNA:DNA hybrids. The enzyme requires a primer (DNA primers are more efficient than RNA primers) as well as Mg^{2+} or Mn^{2+}. The enzyme possesses an intrinsic RNase H activity. Both nonionic detergents and sulfhydryl compounds stabilize the enzyme activity in vitro.

Features:

- **High Concentration:** Cat.# M9004 contains 600 units of AMV RT at 20–25u/µl.
- **5X Reaction Buffer:** 250mM Tris-HCl (pH 8.3 at 25°C), 250mM KCl, 50mM $MgCl_2$, 2.5mM spermidine, 50mM DTT.
- **Temperature Stability:** AMV RT is the preferred reverse transcriptase for templates with high secondary structure due to its stability at higher reaction temperatures (37–58°C).

Storage Conditions: Store at –20°C.

GoScript™ Reverse Transcription System

Product	Size	Cat.#
GoScript™ Reverse Transcription System	50 reactions	A5000
	100 reactions	A5001
Available Separately		
GoScript™ Reverse Transcriptase	100 reactions	A5003
	500 reactions	A5004
GoScript™ Reverse Transcription Mix, Oligo(dT)	50 reactions	A2790
	100 reactions	A2791
GoScript™ Reverse Transcription Mix, Random Primers	50 reactions	A2800
	100 reactions	A2801

A5000, A5001, A2790, A2791, A2800, A2801 For Research Use Only. Not for Use in Diagnostic Procedures. A5003, A5004 For Laboratory Use.

Description: The GoScript™ Reverse Transcription System includes a reverse transcriptase and a specialized set of reagents for efficient synthesis of first-strand cDNA optimized for quantitative PCR amplification. GoScript™ Reverse Transcriptase uses M-MLV Reverse Transcriptase and state-of-the-art buffer technology to deliver robust, reliable cDNA synthesis of a full range of rare and abundant transcripts, even in the presence of inhibitors. GoScript™ Reverse Transcriptase is qualified for use in qPCR, including GoTaq® qPCR systems.

Features:

- Available as a standalone enzyme, a complete reverse transcription kit or as a master mix with Oligo(dT) or Random Primers.
- Achieve sensitive transcription of both high-copy and low-copy messages.
- Transcribe short and long transcripts; process through secondary structure.

Storage Conditions: Store at –30°C to –10°C.

Available in the Helix® on-site stocking system
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Reverse Transcription System

Product	Size	Cat.#
Reverse Transcription System	100 reactions	A3500
Available Separately	**Size**	**Conc.**	**Cat.#**
Magnesium Chloride Solution	1.5 ml	25 mM	A3511
Reverse Transcription 10X Buffer	1.4 ml		A3561

A3500 For Research Use Only. Not for Use in Diagnostic Procedures.
A3511, A3561 For Laboratory Use.

Description: The Reverse Transcription System provides reagents to efficiently reverse transcribe RNA into cDNA in 15 minutes. The cDNA prepared from each reaction may be used directly in multiple PCR amplifications using *Taq* DNA polymerase. The AMV Reverse Transcriptase synthesizes single-stranded cDNA from total or poly(A)+ RNA. Both Oligo$(dT)_{15}$ and Random Primers are included, allowing cDNA synthesis from virtually any RNA source. The system contains sufficient reagents for 100 cDNA synthesis reactions, processing 1µg of RNA per reaction. Each cDNA synthesis reaction can be divided and used in up to 20 separate PCR amplifications. A polyadenylated 1.2kb RNA transcript is provided as a control template for cDNA synthesis.

Features:

- **Speed:** Efficiently reverse transcribe poly(A)+ mRNA or total RNA in 15 minutes.
- **Convenience:** PCR-compatible components are provided in optimized volumes for 100 reactions.
- **Positive Controls:** A polyadenylated RNA transcript is provided to help troubleshoot RT-PCR parameters.

Storage Conditions: Store at –20°C. Store Positive Control RNA at –70°C.

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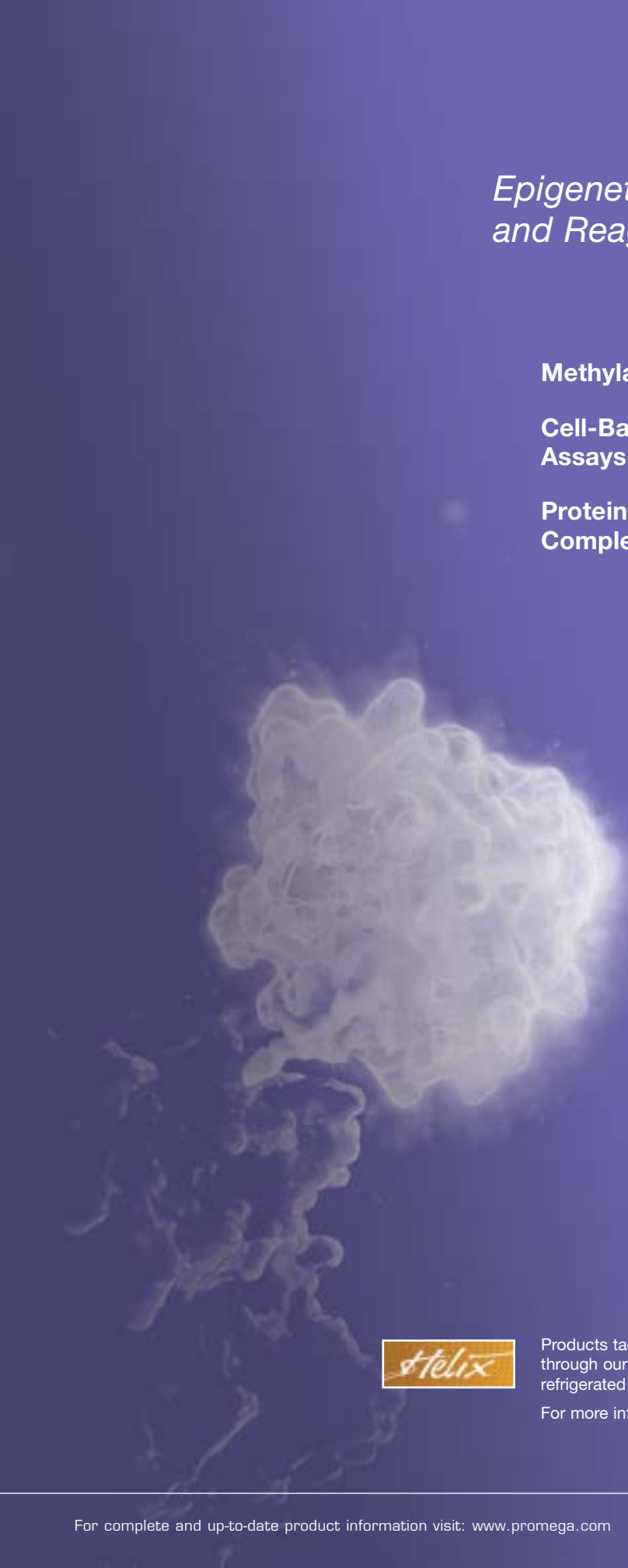
Promega

Epigenetics Research Kits and Reagents



Products tagged with the Helix® icon are available for distribution through our convenient on-site stocking program in a freezer, refrigerated unit or an ambient cabinet.

For more information visit: **www.promega.com/helix**

Available in the Helix® on-site stocking system

Methylation Analysis

MethylEdge™ Bisulfite Conversion System

Product	Size	Cat.#
MethylEdge™ Bisulfite Conversion System	50 reactions	N1301
Available Separately		
Methylated Human Control	5 µg	N1231
Converted Methylated Human Control	1 µg	N1221

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The MethylEdge™ Bisulfite Conversion System provides a rapid, efficient method to perform bisulfite conversion with minimal DNA fragmentation in less than two hours. The rapid protocol and complete conversion mean that you can produce completely converted DNA ready for downstream assays with minimal preparation and hands-on time.

Features:

- **Effective Conversion Reagents:** High-efficiency DNA conversion.
- **Rapid Protocol:** Time savings compared to other conversion systems.
- **Intact DNA:** Robust conversion of DNA with reduced DNA fragmentation.
- **Room-Temperature, Ready-to-Use Reagents:** Convenient system configuration allows room-temperature storage and minimal up-front preparation.

Storage Conditions: Store the MethylEdge™ Bisulfite Conversion System at 22–25°C (room temperature). Store the Methylated Human Control at 2–10°C. Store the Converted Methylated Human Control at –30 to –10°C.

Succinate-Glo™ JmjC Demethylase/ Hydroxylase Assay

Product	Size	Cat.#
Succinate-Glo™ JmjC Demethylase/Hydroxylase Assay	1,000 assays	V7990
	10,000 assays	V7991

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: JumonjiC domain-containing histone lysine demethylases (JMJCs) play a pivotal role in determining the epigenetic status of the genome by counteracting the activities of histone lysine methyltransferases. These enzymes act as erasers by catalyzing the removal of methyl marks from specific lysine sites in histones, leading to either transcriptional repression or activation of target genes.

The Succinate-Glo™ JmjC Demethylase/Hydroxylase Assay rapidly detects succinate formation in JumonjiC histone demethylase and Fe(II)/α-ketoglutarate-dependent dioxygenase reactions. The assay uses the reaction product, succinate, to form ATP, which drives a bioluminescent reaction to produce a signal proportional to the original demethylase/ hydroxylase activity.

Features:

- Easy to use add-and-read assay format.
- Universal assay can be used with any succinate-producing enzyme.
- Optimized for screening applications; low false hits.

Storage Conditions: Store complete kit at less than –65°C. Alternatively, store the Succinate-Glo™ Solution at less than –65°C and all other components at –30°C to –10°C. Minimize freeze-thaw cycles.

MTase-Glo™ Methyltransferase Assay

Product	Size	Cat.#
MTase-Glo™ Methyltransferase Assay	400 assays	V7601
	2,000 assays	V7602

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The MTase-Glo™ Assay is a bioluminescence-based assay that can be used to monitor the activities of methyltransferases (MTases) and their modulation by small molecules in a wide range of plate formats. The assay is well suited for high-throughput screening applications. The assay monitors formation of the reaction product S-adenosyl homocysteine (SAH) and can detect changes in activity of a broad range of methyltransferases, including DNA, protein, RNA and small molecule methyltransferases. The MTase-Glo™ Assay can be used for all classes of protein methyltransferases (lysine and arginine) and with different types of substrates (peptides, large proteins and even nucleosomes) to determine the specificity of these enzymes and their substrate requirements.

After the methyltransferase reaction is complete, the MTase-Glo™ Reagent is added to convert SAH to ADP. The MTase-Glo™ Detection Solution is then added to convert ADP to ATP, which is detected via a coupled luciferase reaction. Luminescence is measured using a plate-reading luminometer and can be correlated to SAH concentration using an SAH standard curve. The half-life of the luminescent signal is greater than 4 hours. This extended signal half-life eliminates the need for luminometers with injectors and allows batch-mode processing of multiple plates.

Features:

- **Easily Monitor Methyltransferase Activity:** Simple add-and-read format makes it easy to monitor methyltransferase activity.
- **Use Any Methyltransferase:** Can be used with any methyltransferase that uses S-adenosyl methionine (SAM) as the methyl group donor.
- **Experience Low False Hits:** Bioluminescent assay optimized for screening applications; no concerns about fluorescence interference.
- **Use Less Enzyme:** Low background and large dynamic range of assay produces excellent signal-to-noise ratios at low enzyme concentrations.
- **Use Natural Substrates:** No need to modify substrates, which can lead to kinetic artifacts.
- **Enjoy Flexibility:** No interference from high concentrations of SAM in assay.

Storage Conditions: Store the MTase-Glo™ Methyltransferase Assay at –70°C. Before use, thaw all components completely at room temperature except for the 10X MTase-Glo™ Reagent, which should be thawed on ice. Mix thawed reagents thoroughly before use, but do not vortex. Store the thawed 10X MTase-Glo™ Reagent on ice until ready to use. After the first use, dispense the 10X MTase-Glo™ Reagent into single-use aliquots and store at –70°C. Prepare working dilutions of the MTase-Glo™ Reagent immediately before use, and prepare only enough for each experiment; do not freeze the diluted reagent. After the first use, dispense the thawed MTase-Glo™ Detection Solution into single-use aliquots and store at –20°C. See the product label for expiration date.

Methylation-Specific Restriction Enzymes

Product	Size	Conc.	Cat.#
HpaII	1,000 u	10 u/µl	R6311
	5,000 u	10 u/µl	R6315
MboI	200 u	8–12 u/µl	R6711
MspI	2,000 u	10 u/µl	R6401
	10,000 u	10 u/µl	R6405

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Cell-Based and Biochemical Assays

NanoBRET™ Target Engagement BET BRD Assays

Product	Size		Cat.#
NanoBRET™ TE Intracellular BET BRD Assay	100 assays		N2130
	1,000 assays		N2131
NanoBRET™ TE Intracellular BET BRD Detection Reagents	10,000 assays		N2140
NanoBRET™ TE BET BRD DNA Bundle	1 each		N2150
NanoBRET™ TE Intracellular BET BRD Complete Kit	1,000 assays		N2180
Available Separately	**Size**	**Conc.**	**Cat.#**
Intracellular TE Nano-Glo® Substrate/Inhibitor	1,000 assays		N2160
	10,000 assays		N2161
Tracer Dilution Buffer	50 ml		N2191
Transfection Carrier DNA	5 × 20 µg	1 µg/µl	E4881

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Description: The NanoBRET™ Target Engagement (TE) Intracellular BET BRD Assay measures compound binding at select BET bromodomain target proteins within intact cells. This target engagement assay is based on the NanoBRET™ System, an energy transfer technique designed to measure molecular proximity in living cells. The NanoBRET™ TE BET BRD Assay analyzes the apparent affinity of test compounds by competitive displacement of a NanoBRET™ tracer reversibly bound to a NanoLuc® BET BRD fusion protein in cells.

The NanoBRET™ TE Assay uses four key components: An expressed cellular target protein that is fused to the bright NanoLuc® luciferase; a cell-permeable fluorescent tracer that specifically binds to the target protein; a substrate for NanoLuc® luciferase; and a cell-impermeable inhibitor for NanoLuc® luciferase. Bioluminescence resonance energy transfer (BRET) is achieved by transferring the luminescent energy from NanoLuc® luciferase to the fluorescent tracer that is bound to the target protein-NanoLuc® fusion. Compounds that are applied to the cells and specifically engage the intracellular target protein-NanoLuc® fusion will result in a decrease in BRET. To ensure accurate assessment of intracellular target engagement, a NanoLuc® inhibitor is used to mitigate any extracellular NanoLuc® signal that may arise from cells compromised during handling, while not adversely affecting NanoLuc® luciferase expressed within healthy living cells.

Features:

- **Measure Target Engagement in Live Cells:** Measure BET BRD-test compound affinity and residence time in live cells; more physiologically relevant information.
- **Directly Measure Residence Time:** Compound and tracer compete directly for the binding site.
- **Use Full-Length Protein:** Assays rely on full-length proteins that are similar to the native forms.
- **Express Target Proteins at Low Levels:** Expression levels are comparable to endogenous proteins.
- **Enjoy Convenience:** Fully optimized assays provide a sensitive method to assess compound affinity, permeability and duration of drug-target interactions; proven performance on GloMax® Discover System.

Storage Conditions: Store the entire NanoBRET™ TE Intracellular BET BRD Assay at less than –65°C. Alternatively, store the NanoBRET™ Intracellular TE BET BRD Tracer, 0.1mM, at less than –65°C and all other components at less than –10°C. Avoid multiple freeze-thaw cycles of the vector components. Store NanoBRET™ Intracellular TE BET BRD Tracer, 0.1mM, NanoBRET™ Nano-Glo® Substrate and Extracellular NanoLuc® Inhibitor protected from light.

NanoBRET™ Target Engagement HDAC Assays

Product	Size		Cat.#
NanoBRET™ TE Intracellular HDAC Assay	100 assays		N2080
	1,000 assays		N2081
NanoBRET™ TE Intracellular HDAC Detection Reagents	10,000 assays		N2090
NanoBRET™ TE HDAC DNA Bundle	1 each		N2120
NanoBRET™ TE Intracellular HDAC Complete Kit	1,000 assays		N2170
Available Separately	**Size**	**Conc.**	**Cat.#**
Intracellular TE Nano-Glo® Substrate/Inhibitor	1,000 assays		N2160
	10,000 assays		N2161
Tracer Dilution Buffer	50 ml		N2191
Transfection Carrier DNA	5 × 20 µg	1 µg/µl	E4881

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The NanoBRET™ Target Engagement (TE) Intracellular HDAC Assay measures compound binding at select HDAC target proteins within intact cells. This target engagement assay is based on the NanoBRET™ System, an energy transfer technique designed to measure molecular proximity in living cells. The NanoBRET™ TE HDAC Assay analyzes the apparent affinity of test compounds by competitive displacement of a NanoBRET™ tracer reversibly bound to a NanoLuc® HDAC fusion protein in cells.

The NanoBRET™ TE Assay uses four key components: An expressed cellular target protein that is fused to the bright NanoLuc® luciferase; a cell-permeable fluorescent tracer that specifically binds to the target protein; a substrate for NanoLuc® luciferase; and a cell-impermeable inhibitor for NanoLuc® luciferase. Bioluminescence resonance energy transfer (BRET) is achieved by transferring the luminescent energy from NanoLuc® luciferase to the fluorescent tracer that is bound to the target protein-NanoLuc® fusion. Compounds that are applied to the cells and specifically engage the intracellular target protein-NanoLuc® fusion will result in a decrease in BRET. To ensure accurate assessment of intracellular target engagement, a NanoLuc® inhibitor is used to mitigate any extracellular NanoLuc® signal that may arise from cells compromised during handling, while not adversely affecting NanoLuc® luciferase expressed within healthy living cells.

Features:

- **Measure Target Engagement in Live Cells:** Measure HDAC-test compound affinity and residence time in live cells; more physiologically relevant information.
- **Directly Measure Residence Time:** Compound and tracer compete directly for the binding site.
- **Use Full-Length Protein:** Assays rely on full-length proteins that are similar to the native forms.
- **Express Target Proteins at Low Levels:** Expression levels are comparable to endogenous proteins.
- **Enjoy Convenience:** Fully optimized assays provide a sensitive method to assess compound affinity, permeability and duration of drug-target interactions; proven performance on GloMax® Discover System.

Storage Conditions: Store the entire NanoBRET™ TE Intracellular HDAC Assay at less than –65°C. Alternatively, store the NanoBRET™ Intracellular TE HDAC Tracer, 0.1mM, at less than –65°C and all other components at less than –10°C. Avoid multiple freeze-thaw cycles of the vector components. Store NanoBRET™ Intracellular TE HDAC Tracer, 0.1mM, NanoBRET™ Nano-Glo® Substrate and Extracellular NanoLuc® Inhibitor protected from light.

HDAC-Glo™ Class IIa and HDAC-Glo™ 2 Assays

Product	Size	Cat.#
HDAC-Glo™ Class IIa Assay	10 ml	G9560
HDAC-Glo™ 2 Assay	10 ml	G9590

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Description: The HDAC-Glo™ Class IIa and HDAC-Glo™ 2 Assays are single-reagent-addition, homogeneous, luminescent assays that measure the relative activity of histone deacetylase (HDAC) Class IIa and Class I enzyme 2, respectively, from cells, extracts or purified enzyme sources.

The assays use an acetylated, live-cell-permeant, luminogenic peptide substrate that can be deacetylated by HDAC activities. Deacetylation of the peptide aminoluciferin substrate is measured using a coupled enzymatic system in which a protease in the Developer Reagent cleaves the deacetylated peptide from the aminoluciferin substrate, releasing aminoluciferin, which is quantified in a reaction using Ultra-Glo™ Recombinant Luciferase (firefly). The signal from the assay reaction can be measured within 15–45 minutes after reagent addition with no sample manipulation. The HDAC-mediated luminescent signal is persistent, with a half-life of greater than 2 hours, allowing batch processing of multiwell plates.

Features:

- **Provide Relevant Insight into Compound Effects in Biological Setting:** Make better decisions about your compound library early in drug screening.
- **Panel of Screening Tools Allows Comprehensive Screening of HDAC Activity:** Easy detection of Class IIa or Isozyme 2 in the same, convenient platform.
- **Highly Sensitive:** Dynamic range 10- to 100-fold higher than comparable fluorescence methods.
- **Flexible Format:** Determine inhibitor performance in both biochemical and predictive cell-based formats using viable cells or in vitro with cell extracts or purified recombinant enzymes.
- **Simple Measurement of Deacetylating Activities:** Easy implementation from benchtop to screening with a single-reagent-addition, homogeneous, add-mix-measure protocol.
- **Fast Data Acquisition in as Little as 15 Minutes:** Achieve maximum signal in as little as 15 minutes with persistent glow-type steady-state signal, making the protocol amenable to automation in high-throughput formats and compatible with luminometers without injectors.
- **Robust Detection:** Minimize assay interference often encountered with fluorescent assays with robust, bioluminescence-based detection. This technology also allows you to multiplex with cell-health assays, offering more biologically relevant data within a predictive, cell-based context.

Storage Conditions: Store at –30°C to –10°C protected from light.

HDAC-Glo™ I/II Assays and Screening Systems

Product	Size		Cat.#
HDAC-Glo™ I/II Assay	10 ml		G6420
	5 × 10 ml		G6421
	100 ml		G6422
HDAC-Glo™ I/II Screening System	10 ml		G6430
	5 × 10 ml		G6431
Available Separately	**Size**	**Conc.**	**Cat.#**
HeLa Nuclear Extract	10 µl	5 mg/ml	G6570

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The HDAC-Glo™ I/II Assays and Screening Systems are single-reagent-addition, homogeneous, luminescent assays that measure the relative activity of histone deacetylase (HDAC) class I and II enzymes from cells, extracts or purified enzyme sources. The assays use an acetylated, live-cell-permeant, luminogenic peptide substrate that can be deacetylated by HDAC activities. Deacetylation of the peptide aminoluciferin substrate is measured using a coupled enzymatic system in which a protease in the Developer Reagent cleaves the deacetylated peptide from the aminoluciferin substrate, releasing aminoluciferin, which is quantified in a reaction using Ultra-Glo™ recombinant firefly luciferase. The assay reaction is typically complete within 15–45 minutes with no sample manipulation. The HDAC-mediated luminescent signal is persistent, with a half-life of greater than 3 hours, allowing batch processing of multiwell plates. The HDAC assay is broadly useful for class I and II enzymes.

The Trichostatin A, included in the HDAC-Glo™ I/II Screening Systems, is a known pan HDAC inhibitor that may be used as a positive control inhibitor. The Trichostatin A is supplied at a concentration of 10mM in DMSO.

The HeLa Nuclear Extract, included in the HDAC-Glo™ I/II Screening Systems or available separately, may be used as a source of histone deacetylase activity. The diluted extract also can be used as an HDAC-Glo™ I/II Assay chemistry control.

Features:

- **Simple Measurement of Deacetylating Activities:** Use a single-reagent-addition, homogeneous, add-mix-measure protocol for easy implementation from benchtop to screening.
- **Highly Sensitive:** Obtain 10- to 100-fold higher sensitivity than comparable fluorescence methods.
- **Fast Data Acquisition:** Achieve maximum signal in as little as 15 minutes with persistent glow-type steady-state signal, making the protocol amenable to automation in high-throughput formats and compatible with luminometers without injectors.
- **Flexible to Sample Type:** Use with viable cells, extracts or purified recombinant enzyme sources.

Storage Conditions: Store the HDAC-Glo™ Assay components at –30°C to –10°C protected from light. Store HeLa Nuclear Extract at –70°C.

Available in the Helix® on-site stocking system

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SIRT-Glo™ Assays and Screening Systems

Product	Size		Cat.#
SIRT-Glo™ Assay	10 ml		G6450
Available Separately	**Size**	**Conc.**	**Cat.#**
HeLa Nuclear Extract	10 µl	5 mg/ml	G6570

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The SIRT-Glo™ Assay is a single-reagent-addition, homogeneous, luminescent assay that measures the relative activity of the NAD^+-dependent histone deacetylase (HDAC) class III enzymes (sirtuins; SIRTs) from purified enzyme sources. The assay uses an acetylated, luminogenic peptide substrate that can be deacetylated by SIRT activities. Deacetylation of the peptide aminoluciferin substrate is measured using a coupled enzymatic system in which a protease in the Developer Reagent cleaves the deacetylated peptide from the aminoluciferin substrate, releasing aminoluciferin, which is quantified in a reaction using Ultra-Glo™ recombinant firefly luciferase. The assay reaction is typically complete within 15–45 minutes with no sample manipulation. The SIRT-mediated luminescent signal is persistent with a half-life of greater than 3 hours, allowing batch processing of multiwell plates. The SIRT-Glo™ Assay is broadly useful for NAD^+-dependent Sirtuin enzymes.

Nicotinamide, included in the SIRT-Glo™ Screening Systems, is a known inhibitor of SIRTs and used as a positive control inhibitor. Nicotinamide is supplied at a concentration of 1M in SIRT-Glo™ Buffer.

The HeLa Nuclear Extract, included in the SIRT-Glo™ Screening Systems or available separately, may be used as an assay chemistry control. HeLa Nuclear Extract is supplied at a concentration of 5mg/ml.

Features:

- **Simple Measurement of Deacetylating Activities:** Use a single-reagent-addition, homogeneous, add-mix-measure protocol for easy implementation from benchtop to screening.
- **Highly Sensitive:** Achieve 10- to 100-fold higher sensitivity than comparable fluorescence methods.
- **Fast Data Acquisition:** Measure maximum signal in as little as 10–15 minutes with persistent glow-type steady-state signal.

Storage Conditions: Store the SIRT-Glo™ Assay components at –20°C. Store HeLa Nuclear Extract at –70°C.

RealTime-Glo™ MT Cell Viability Assay

Product	Size	Cat.#
RealTime-Glo™ MT Cell Viability Assay	100 reactions	G9711
	10 × 100 reactions	G9712
	1,000 reactions	G9713

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The RealTime-Glo™ MT Cell Viability Assay is a nonlytic, homogeneous, bioluminescent method to determine in real time the number of viable cells in culture by measuring reducing potential and thus metabolism (MT). The assay involves adding NanoLuc® luciferase and a cell-permeant pro-NanoLuc® substrate to cells in culture. Viable cells reduce the pro-substrate to generate a substrate for NanoLuc® luciferase. This substrate diffuses from cells into the surrounding culture medium, where it is rapidly used by the NanoLuc® enzyme to produce a luminescent signal. The signal correlates with the number of viable cells, making the assay well suited for cytotoxicity studies. The reagent is stable and nontoxic to cells for up to 72 hours. No cell washing, removal of medium or further reagent addition is required to determine the number of viable cells. The nonlytic nature of this assay enables cells to be monitored over time in the same well, reducing the amount of cells used and cell culture costs, and allowing downstream applications, including assay multiplexing and nucleic acid analysis.

Features:

- **Real-Time Cell Viability Measurements:** Monitor cell viability in real time to determine onset of toxicity, analyze potency versus efficacy over time and analyze differential cell growth with a simple, plate-based protocol.
- **Superior Sensitivity:** The bioluminescent assay provides a greater signal-to-background ratio and higher sensitivity in less time compared to colorimetric or fluorometric viability assays based on reducing potential.
- **Assay Setup Flexibility:** Perform real-time measurements by adding reagents when cells are plated, when test compound is added to the cells or at any time point when cell viability measurements are needed. Alternatively, set up the assay for an endpoint cell viability determination.
- **Nonlytic Assay Format:** The RealTime-Glo™ MT Cell Viability Assay does not require cell lysis. Use cells to multiplex with other luminescent or fluorescent assays without the need for special filters or use cells later in a variety of downstream applications. This means you will use less sample and obtain more informative data points per sample.
- **Well Established Marker of Cell Viability:** The assay chemistry is based on the reducing potential of the cell, which is a trusted metabolic marker of cell viability.
- **Compatibility with Automation:** The assay is compatible with automated and high-throughput protocols. Reactions are scalable and can be performed at low volumes in 96-, 384- and 1,536-well plates.

Storage Conditions: Store the RealTime-Glo™ MT Cell Viability Assay reagents at –20°C, protected from light. Avoid prolonged exposure to light of the MT Cell Viability Substrate, 1,000X. Avoid multiple freeze-thaw cycles. See product label for expiration date.

ApoTox-Glo™ Triplex Assay

Product	Size	Cat.#
ApoTox-Glo™ Triplex Assay	10 ml	G6320
	5 × 10 ml	G6321

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ApoTox-Glo™ Triplex Assay combines three assay chemistries to easily assess viability, cytotoxicity and apoptosis events in the same assay well. First, viability and cytotoxicity are determined by measuring two differential protease biomarkers simultaneously with the addition of a single nonlytic reagent containing two peptide substrates. The live-cell protease activity is restricted to intact viable cells and is measured using a fluorogenic, cell-permeant peptide substrate (GF-AFC Substrate). The substrate enters intact cells, where it is cleaved to generate a fluorescent signal proportional to the number of living cells. This live-cell protease activity marker becomes inactive upon loss of membrane integrity and leakage into the surrounding culture medium. A second, cell-impermeant, fluorogenic peptide substrate (bis-AAF-R110 Substrate) is used simultaneously to measure dead-cell protease activity that has been released from cells that have lost membrane integrity. This results in ratiometric, inversely correlated measures of cell viability and cytotoxicity. The ratio of viable cells to dead cells is independent of cell number and, therefore, can be used to normalize data. A second reagent containing luminogenic DEVD-peptide substrate for caspase-3/7 and Ultra-Glo™ Recombinant Thermostable Luciferase is added. Caspase-3/7 cleavage of the substrate releases luciferin, which is a substrate for luciferase and generates light. The light output, measured with a luminometer, correlates with caspase-3/7 activation as a key indicator of apoptosis.

Features:

- **Measure Viability, Cytotoxicity and Apoptosis in the Same Sample Well:** Determine mechanism of cell death for cells in the same well.
- **Easily Implement:** Simple sequential "add-mix-measure" format.
- **Normalize Data with a Built-In Control:** The ratio of the number of live cells/number of dead cells is independent of cell number and normalizes data. This normalization makes results more comparable well-to-well, plate-to-plate and day-to-day.
- **Easily Automate this Flexible Assay:** Component volumes can be scaled to meet throughput needs. Amenable to automation in 96- and 384-well plates.
- **Improve Efficiency and Save Lab Budget:** Reduce cell culture and labor costs by performing three assays in a single well.

Storage Conditions: Store all components at –20°C protected from light.

MultiTox-Glo Multiplex Cytotoxicity Assay

Product	Size	Cat.#
MultiTox-Glo Multiplex Cytotoxicity Assay	10 ml	G9270
	5 × 10 ml	G9271
	2 × 50 ml	G9272

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The MultiTox-Glo Multiplex Cytotoxicity Assay is a sequential-reagent-addition fluorescent and luminescent assay that measures the relative number of live and dead cells in cell populations. The MultiTox-Glo Assay sequentially measures two protease activities; one is a marker of viability, and the other is a marker of cytotoxicity. The live-cell protease activity is restricted to intact viable cells and is measured using a fluorogenic, cell-permeant, peptide substrate (GF-AFC). This substrate enters intact cells, where it is cleaved by the live cell protease activity to release AFC and generate a fluorescent signal that is proportional to the number of viable cells. The live-cell protease becomes inactive upon loss of membrane integrity and leakage into the surrounding culture medium. A second, luminogenic cell-impermeant peptide substrate (AAF-aminoluciferin) is used to measure dead-cell protease activity, which is released from cells that have lost membrane integrity. The liberated aminoluciferin product is measured as "glow type" luminescence generated by Ultra-Glo™ Recombinant Luciferase provided in the assay reagent.

The MultiTox-Glo Assay gives ratiometric, inversely correlated measures of cell viability and cytotoxicity, which correlate with established methods for measuring viability and cytotoxicity. The ratio of viable cells to dead cells is independent of cell number and, therefore, can be used to normalize data. Having complementary cell viability and cytotoxicity measures reduces errors associated with pipetting and cell clumping, as well as serving as an internal control to allow identification of errors resulting from chemical interference from test compounds or media components.

Features:

- **Measure the Number of Live Cells and Dead Cells in Culture:** Sequential-reagent-addition assay with a homogeneous "add-mix-measure" protocol.
- **Normalize Data with a Built-In Internal Control:** The ratio of the number of live cells/number of dead cells is independent of cell number and can be used to normalize data. This normalization makes results more comparable well-to-well, plate-to-plate and day-to-day.
- **Immediately Identify More False-Positives and False-Negatives:** Independent cell viability and cytotoxicity measurements serve as controls for each other. If test compounds interfere with one assay chemistry, the other serves as an internal control.
- **Improve your Data:** Reduce statistical probability of false-positives (or false-negatives), and eliminate fluorescence interference issues by luminescence readout.

Storage Conditions: Store at –20°C, protected from light.

Available in the Helix® on-site stocking system

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IdeS Protease and IdeZ Protease

Product	Size	Conc.	Cat.#
IdeS Protease	5,000 units		V7511
IdeS Protease	25,000 units		V7515
IdeZ Protease	5,000 units		V8341
IdeZ Protease, Frozen	2,000 units	50 u/µl	V8342
IdeZ Protease	25,000 units		V8345

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Description: IdeS Protease

IdeS Protease is an immunoglobulin-degrading enzyme from *Streptococcus pyogenes* (IdeS). It is an engineered recombinant protease overexpressed in *E. coli* that cleaves Immunoglobulin G (IgG) with high specificity at a single site below the hinge region, yielding $F(ab')_2$ and Fc fragments. The protocol for a standard reaction is to add the IdeS Protease to the IgG sample, add 1 unit of IdeS Protease per 1µg of IgG to be digested and incubate the sample at 37°C for 30–60 minutes in a neutral pH buffer.

IdeZ Protease

IdeZ Protease is an immunoglobulin-degrading enzyme from *Streptococcus equi* subspecies *zooepidemicus*. It is an engineered recombinant protease overexpressed in *E. coli*. Like IdeS Protease, IdeZ Protease specifically cleaves IgG molecules below the hinge region to yield $F(ab')_2$ and Fc fragments. However, IdeZ Protease has significantly improved activity against mouse IgG2a and IgG3 subclasses compared to IdeS Protease.

Features:

- **See Digestion in 30 Minutes with No Optimization:** Fast and easy to use.
- **Cleave Exclusively at a Single Site Below the Hinge to Produce $F(ab')_2$ and Fc Fragments:** Highly reproducible and specific.
- **Expect High Performance:** Essentially 100% complete digestion.
- **Effectively Cleave Many IgG Molecules:** Both IdeS and IdeZ Proteases effectively cleave human IgG1, IgG2, IgG3 and IgG4, monkey, sheep, rabbit, humanized and chimeric IgGs as well as Fc-fusion proteins. However, mouse IgG2a and IgG3 are cleaved by IdeZ Protease only.

Storage Conditions: Store IdeS Protease at –30°C to –10°C. Store IdeZ Protease at –30°C to –10°C.

6 × 5 LC-MS/MS Peptide Reference Mix

Product	Size	Cat.#
6 × 5 LC-MS/MS Peptide Reference Mix	50 µl	V7491
	200 pmol	V7495

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The 6 × 5 LC-MS/MS Peptide Reference Mix is a unique reagent designed to monitor liquid chromatography (LC) and mass spectrometry (MS) instrument performance and assist in method development and optimization. The product is a mixture of 30 peptides; 6 sets of 5 isotopologues of the same peptide sequence. The isotopologues differ only by the number of stable, heavy-labeled amino acids incorporated into the sequence. The labels consist of uniform ^{13}C and ^{15}N atoms. Chromatographically, each of the isotopologues is indistinguishable; however, since they differ in mass, they are clearly resolved by mass spectrometry. The isotopologues of each peptide are present in a series of tenfold dilutions. This format allows assessment of instrument dynamic range and sensitivity from a single run.

Peptides with a wide range of hydrophobicities were chosen to enable reporting of LC column performance. In addition, the peptides were chosen for maximal stability. Amino acids prone to artificial post-translational modification (i.e., methionine, asparagine, etc.) were excluded from the sequences. None of the peptides have internal lysines or arginines and will therefore not be affected by trypsin or Lys-C. In addition there is a mass separation of at least 4 Daltons between the isotopologues, so that even low-resolution instruments can distinguish the masses.

PReMiS™ Software Tool

The 6 x 5 LC-MS/MS Peptide Reference Mix is accompanied by a complementary PReMiS™ Software tool (available by download) that reports on key liquid chromatography and mass spec parameters. The parameter reports can be exported to CSV or saved as .pdf files.

In addition to the general reporting feature, performance parameters can be tracked over time, allowing a clear assessment of trends to pinpoint poor performance and maintenance needs. For those laboratories that have multiple instruments, the ability to compare parameters across instruments will also be available. Thermo (.raw) and ABSCIEX (.wiff) formats are available for direct importing. Other vendor formats can be imported after conversion to .mzml format. Data reports are rapidly generated (usually in less than 2 minutes), with clear presentation of the XIC of all 30 masses available for immediate viewing.

Features:

- **Save Time:** Unique peptide formulation allows assessment of LC and MS parameters in one run with a single reagent.
- **Eliminate Manual Calculations:** Complementary software provides routine analysis.
- **Ensure Consistent Instrument Performance Over Time:** Complementary software provides historical monitoring.
- **Accurately Report Instrument Sensitivity and Dynamic Range:** Peptides are AAA-qualified.
- **Use with Neat or Complex Mixture Analysis:** Compatible with multiple applications.

Storage Conditions: Store at –30°C to –10°C.

HaloTag® Mammalian Protein Purification System

Product	Size		Cat.#
HaloTag® Mammalian Protein Detection and Purification System	1 each		G6795
HaloTag® Mammalian Protein Purification System	1 each		G6790
HaloTag® Mammalian Protein Detection and Purification System Sample Pack	1 each		G6799
Available Separately	**Size**	**Conc.**	**Cat.#**
HaloTEV Protease	200 µl	5 u/µl	G6601
	800 µl	5 u/µl	G6602
HaloTag® TMRDirect™ Ligand	30 µl	0.1 mM	G2991
Protease Inhibitor Cocktail, 50X	1 ml		G6521

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Description: The HaloTag® Mammalian Protein Purification System (Cat.# G6790) is an optimized kit for purification of HaloTag® fusion proteins from mammalian cell culture lysates. HaloTag® fusion proteins form a highly specific and covalent bond with the HaloLink™ Resin. The covalent binding coupled with the low nonspecific binding of the HaloLink™ Resin provides superior purity and recovery of recombinant proteins from cultured mammalian cells, even at low expression levels. The HaloTag® Mammalian Protein Detection and Purification System (Cat.# G6795) also includes HaloTag® TMRDirect™ Ligand. The simple-to-use fluorescent detection of the HaloTag® fusion facilitates rapid optimization of expression and purification conditions.

Features:

- **Purify More Protein:** HaloLink™ Resin covalently binds >7mg/ml of HaloTag® fusion protein (10X more capacity compared to FLAG®). Recovery is highly efficient, commonly >75%.
- **Higher Purity:** Covalent capture allows extensive and/or stringent washes without loss of bound protein, resulting in very low (<0.1%) nonspecific binding and a highly pure protein.
- **Easily Scalable:** Scale up and down, important for obtaining mg-plus quantities.
- **Optimized for Mammalian Protein Expression:** The HaloTag® platform allows flexibility to move between purification, pull-downs and cellular imaging with a single construct.

Storage Conditions: Store Spin Columns at room temperature. Store HaloLink™ Resin at 4°C. Store HaloTEV Protease below –65°C. Store HaloTag® TMRDirect™ Ligand and powdered Protease Inhibitor Cocktail at –30 to –10°C. Reconstituted Protease Inhibitor Cocktail can be stored at 2–10°C for 12 months.

HaloTag® Protein Purification System

Product	Size	Cat.#
HaloTag® Protein Purification System	1 each	G6280
HaloTag® Protein Purification System Sample Pack	1 each	G6270

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The HaloTag® Protein Purification System is designed to purify proteins fused to the HaloTag® protein tag that enhances the expression and solubility of recombinant proteins. HaloTag® Technology enables the covalent, efficient and specific capture of a protein of interest onto HaloLink™ Resin, thus overcoming the equilibrium-based limitations associated with affinity tags (i.e., poor capture of proteins expressed at low levels and protein loss during washing of the purification resin).

HaloTag® technology offers a quick and convenient way to test expression of HaloTag® fusion proteins as well as monitor the efficiency of immobilization to HaloLink™ Resin by labeling with fluorescent HaloTag® TMR Ligand followed by SDS-PAGE analysis. Guidelines can be found in the *HaloLink™ Resin Technical Manual* #TM250, the *HaloLink™ Protein Array Technical Manual* #TM310 and the *HaloCHIP™ System Technical Manual* #TM075.

Outline of Procedure

The HaloTag® protein, a 34kDa mutated hydrolase, covalently attaches to HaloLink™ Resin via an immobilized chloroalkane ligand. TEV Protease cleaves the target protein from the HaloLink™ Resin. The TEV Protease, which has an N-terminal (HQ) tag, is removed from the protein of interest using HisLink™ Resin, and the purified protein of interest is recovered. The appropriate vector that encodes the HaloTag® protein and expresses protein optimally in *E. coli* is pFN18A HaloTag® T7 Flexi® Vector (G2751) or pFN18K HaloTag® T7 Flexi® Vector (G2681). These vectors can be purchased separately.

Features:

- **Experience Superior Yield, Purity and Specific Activity of Soluble, Functional Proteins Compared to His-Tag, GST and MBP Affinity Tags:** Specific and covalent HaloTag® fusion protein capture and immobilization on HaloLink™ Resin.
- **Achieve Enhanced Target Protein Expression in Prokaryotic, Mammalian and Cell-Free Systems:** Proteins are expressed as HaloTag® fusion proteins.
- **Purify Poorly Expressed Fusion Proteins:** Rapid, specific and covalent capture of HaloTag® protein onto HaloLink™ Resin is a nonequilibrium process.
- **Efficiently Recover Tag-Free Target Protein using TEV Protease Cleavage:** Optimized TEV protease recognition site within the interconnecting polypeptide separating the HaloTag® protein and the fusion partner. HaloTag® protein remains immobilized on the resin due to covalent capture.
- **Save Time:** One buffer compatible with downstream applications for all purification steps.
- **Perform Easy In-Gel Detection and Quantification of Protein Expression Levels with Fluorescent HaloTag® Ligands:** Highly stable HaloTag® protein-ligand interaction permits boiling with SDS sample buffer followed by resolving on SDS-PAGE.

Storage Conditions: Store the HaloLink™ Resin and HisLink™ Resin at 4°C. Do not freeze the resins. Store the TEV Protease at –20°C.

MagneGST™ Pull-Down System

Product	Size	Cat.#
MagneGST™ Pull-Down System	80 reactions	V8870

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The MagneGST™ Pull-Down System is designed for detection of protein interactions between GST-fusion proteins expressed in bacterial lysates and prey proteins expressed in the TnT® Systems. Prey protein synthesized in the TnT® Quick Coupled Transcription/Translation Reaction is captured using bait protein (GST-fusion protein) immobilized on MagneGST™ Particles. Nonspecifically bound proteins are then washed away, and the prey protein is analyzed. Prey proteins can be detected by incorporating radioactively labeled methionine in the TnT® Quick reaction, followed by SDS-PAGE and autoradiography or by incorporating the supplied non-radioactive methionine in the TnT® reaction and detecting by Western blotting with protein-specific antibodies.

Storage Conditions: Store the TnT® T7 Quick Master Mix and Methionine at –70°C. Store the RQ1 RNase-Free DNase at –20°C. Store the Nuclease-Free Water, MagneGST™ Glutathione Particles, MagneGST™ Binding/Wash Buffer and Cell Lysis Reagent at 4°C.

HaloCHIP™ System

Product	Size	Cat.#
HaloCHIP™ System	20 reactions	G9410

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The HaloCHIP™ System is a novel method designed for the covalent capture of intracellular protein:DNA complexes without the use of antibodies and offers an efficient and robust alternative to the standard chromatin immunoprecipitation (ChIP) method. Proteins of interest are expressed in cells as HaloTag® fusion proteins, crosslinked to DNA with formaldehyde and then captured on HaloLink™ Resin, which forms a highly specific, covalent interaction with the HaloTag® portion of the fusion protein. Stringent washing removes nonspecific proteins and DNA, and heating reverses the crosslinks between the DNA and the fusion protein and releases the captured DNA fragment, which subsequently can be purified.

Features:

- **No Requirement for Antibody:** No need to make your own or purchase expensive, qualified antibodies.
- **Obtain Results Faster:** Obtain data in 24–48 hours with fewer steps to minimize potential experimental errors.
- **Improved Signal-to-Noise Ratios:** Enables detection of small changes in protein binding patterns using a minimal number of cells.

Storage Conditions: The TE Buffer (pH 8.0), Reversal Buffer and Nuclease-Free Water may be stored at room temperature. Store the HaloLink™ Resin, Mammalian Lysis Buffer and High Salt Wash Buffer at 4°C. Store the HaloCHIP™ Blocking Ligand at –20°C.

HaloTag® Mammalian Pull-Down Systems

Product	Size	Cat.#
HaloTag® Complete Pull-Down System	1 each	G6509
HaloTag® Mammalian Pull-Down and Labeling System	24 reactions	G6500
HaloTag® Mammalian Pull-Down System	24 reactions	G6504
HaloTag® Control Vector	20 µg	G6591
Available Separately		
Protease Inhibitor Cocktail, 50X	1 ml	G6521
Mammalian Lysis Buffer	40 ml	G9381

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The HaloTag® Mammalian Pull-Down Systems (Cat.# G6500, G6504 and G6509) are designed to capture and purify intracellular binary and higher order protein complexes, including transient or weakly interacting partners.

HaloTag® Mammalian Pull-Down System (Cat.# G6504) includes buffers and resin necessary to perform a HaloTag® pull-down.

HaloTag® Mammalian Pull-Down and Labeling System (Cat.# G6500) includes everything in G6504 *plus* the HaloTag® TMRDirect™ Ligand, which allows correlative cellular localization and real-time imaging studies.

HaloTag® Complete Pull-Down System (Cat.# G6509) includes everything in G6500 *plus* a starter cloning system, Wizard® SV Gel and PCR Clean-Up System, and FuGENE® HD Transfection Reagent.

The **HaloTag® Control Vector** provides protein expression of the HaloTag® protein in mammalian cells, *E. coli* or in vitro expression systems dependent on human cytomegalovirus (CMV) intermediate early enhancer, T7 or SP6 RNA polymerase promoters. It can be used as a control for any HaloTag® experimental system and can be used for both stable and transient HaloTag® expression in mammalian cells; for stable expression, co-transfection with a vector containing a selectable marker is required.

The **Protease Inhibitor Cocktail, 50X**, is a mixture of six different protease inhibitors with different target protease specificities. This product is provided in a freeze-dried format and can be reconstituted using either 100% ethanol or DMSO.

The **Mammalian Lysis Buffer** is designed for use with HaloTag® Mammalian-based expression systems such as the HaloTag® Mammalian Pull-Down and Labeling Systems (referenced here) as well as the HaloCHIP™ System (Cat.# G9410). Formulation consists of 50mM Tris-HCl, 150mM NaCl, 1% Triton® X-100 and 0.1% sodium deoxycholate (pH 7.5).

Related Services: Mass Spec Services.

Features:

- **Rapid, Efficient and Covalent Capture of Binary and Higher Order Complexes Directly from Lysates:** Improved capture of protein partners, including transient interactions.
- **High Purity and Low Background:** Improved accuracy in identification of proteins; covalent attachment allows bait protein to remain behind if desired.
- **Ability to Fluorescently Label the Same Genetic Fusion:** Correlate complex capture with cellular localization.
- **Compatibility with All Downstream Methods of Analysis:** Freedom to identify complexes in variety of applications including mass spectrometry.

Storage Conditions: Store the 10X TBS Buffer and SDS Elution Buffer at room temperature. Store the HaloLink™ Resin and Mammalian Lysis Buffer at 4°C. Store the HaloTag® TMRDirect™ Ligand and powdered Protease Inhibitor Cocktail at –30 to –10°C. Reconstituted Protease Inhibitor Cocktail can be stored at 2–10°C for 12 months.

PCR

Products tagged with the Helix® icon are available for distribution through our convenient on-site stocking program in a freezer, refrigerated unit or an ambient cabinet.

For more information visit: **www.promega.com/helix**

Available in the Helix® on-site stocking system

Taq Polymerase and Endpoint PCR

GoTaq® G2 Hot Start Polymerase and Master Mixes

Product	Size	Conc.	Cat.#
GoTaq® G2 Hot Start Polymerase	100 u	5 u/µl	M7401
	500 u	5 u/µl	M7405
	2,500 u	5 u/µl	M7406
	10,000 u	5 u/µl	M7408
GoTaq® G2 Hot Start Green Master Mix	100 reactions		M7422
	1,000 reactions		M7423
GoTaq® G2 Hot Start Colorless Master Mix	100 reactions		M7432
	1,000 reactions		M7433

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Description: GoTaq® G2 Polymerase is the second generation of GoTaq® products. The enzyme comes in a variety of formats designed to provide maximum flexibility, control and convenience.

For superior convenience and improved yield, sensitivity and specificity, choose GoTaq® G2 Hot Start Polymerase, which is bound to a proprietary antibody that blocks activity. Activity is restored during initial denaturation, allowing hot-start PCR. Available as a master mix or standalone enzyme.

GoTaq® G2 Hot Start Polymerase is supplied with 5X Green GoTaq® Flexi Buffer, 5X Colorless GoTaq® Flexi Buffer and 25mM $MgCl_2$. The high-performance GoTaq® G2 DNA Polymerase is bound to a proprietary antibody that blocks polymerase activity. Polymerase activity is restored during the initial denaturation step, when amplification reactions are heated at 94–95°C for two minutes, allowing hot-start PCR in which polymerase activity is inhibited at temperatures below 70°C for convenient, room-temperature reaction setup. Hot-start PCR is advantageous for some amplification targets because it may eliminate or minimize primer-dimer and nonspecific products. In some cases, hot-start PCR may improve yields. GoTaq® G2 Hot Start Polymerase exhibits 5´→3´ exonuclease activity.

The GoTaq® G2 Hot Start Master Mixes are ready-to-use mixes containing all necessary components (GoTaq® G2 Hot Start Polymerase, buffer, dNTPs and optimized magnesium)—you only need to add primer and template and go!

The GoTaq® G2 Hot Start Green Master Mix also contains a gel loading dye to facilitate downstream gel analysis. The GoTaq® G2 Hot Start Colorless Master Mix contains no gel loading dye for use when downstream applications require fluorescence or absorbance readings without purification.

Features:

- Simplify reaction setup and save time with a ready-to-use master mix.
- Prepare your reaction at room temperature, not on ice.
- Eliminate nonspecific amplification with hot-start enzyme.
- Use at no risk—backed by the Promega PCR Satisfaction Guarantee.

Storage Conditions: Store at –30°C to –10°C.

GoTaq® Hot Start Polymerase

Product	Size	Conc.	Cat.#
GoTaq® Hot Start Polymerase	100 u	5 u/µl	M5001
	500 u	5 u/µl	M5005
	2,500 u	5 u/µl	M5006
	10,000 u	5 u/µl	M5008
GoTaq® Hot Start Green Master Mix	100 reactions		M5122
	1,000 reactions		M5123
GoTaq® Hot Start Colorless Master Mix	100 reactions		M5132
	1,000 reactions		M5133

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: GoTaq® Hot Start Polymerase contains the high-performance GoTaq® DNA Polymerase bound to a proprietary antibody that blocks polymerase activity. The polymerase activity is restored during the initial denaturation step when the amplification reactions are heated at 94–95°C for two minutes. This enables hot-start PCR, where polymerase activity is eliminated or minimized at temperatures below 70°C. GoTaq® Hot Start Polymerase exhibits 5´→3´ exonuclease activity. The enzyme is supplied with a tube of 25mM $MgCl_2$ to optimize the magnesium concentration in your reactions. It is also supplied with 5X Green GoTaq® Flexi Buffer and 5X Colorless GoTaq® Flexi Buffer. The buffers contain a compound that increases sample density so that samples sink easily into wells of an agarose gel. The green buffer also contains two dyes (yellow and blue) that separate to allow easy monitoring during electrophoresis. Use the green reaction buffer for direct-to-gel analysis after amplification and the colorless reaction buffer for amplifications where the dyes may interfere with post-amplification analysis such as fluorescence or absorbance testing.

GoTaq® Hot Start Master Mixes are premixed, ready-to-use solutions containing GoTaq® Hot Start Polymerase, magnesium, dNTPs and buffer. Reactions can be set up in less than a minute at room temperature; simply add your template, water and primers. Available with either green or colorless reaction buffers, which also serve as loading buffers, allowing you to go directly from thermal cycler to gel analysis. GoTaq® Hot Start Master Mixes offer the specificity and sensitivity of an antibody-based hot-start polymerase in a convenient, easy-to-use, time-saving format.

Features:

- **Enhanced Yield, Sensitivity and Specificity:** The proven, robust amplification and sensitivity of GoTaq® DNA Polymerase now with built-in hot start to deliver even more superior results.
- **Ease of Use:** Set up your reaction at room temperature—no need to set up on ice.
- **Higher Yield:** Two-minute activation saves time and ensures maximum enzyme activity.
- **Higher Specificity:** Minimize nonspecific amplification and primer-dimers.
- **Improve Productivity:** Go directly from PCR to gel analysis. Green GoTaq® Reaction Buffer serves as both reaction buffer and gel-loading solution.
- **Convenience:** One tube, one pipetting step. Only add template and primers when using the master mixes.
- **Optimization:** Control the magnesium concentration in your reaction for specialized templates when using the standalone polymerase.

Storage Conditions: Store at –30°C to –10°C.

GoTaq® Long PCR Master Mix

Product	Size	Cat.#
GoTaq® Long PCR Master Mix	100 reactions	M4021

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: GoTaq® Long PCR Master Mix contains the high-performance GoTaq® Hot Start Polymerase in a specially formulated mixture with a proprietary thermostable proofreading polymerase. This optimized enzyme mixture allows efficient amplification of up to 40kb from lambda DNA or 30kb from human genomic DNA. The presence of a proofreading enzyme to repair DNA mismatches and a highly processive polymerase allows the polymerase to continue to elongate the DNA much further, resulting in longer DNA amplification.

The optimized formulation of the GoTaq® Long PCR Master Mix components enables simple reaction setup and provides consistently efficient, accurate and robust amplification of long DNA amplicons.

Features:

- **Easy:** Hot-start master mix for convenient handling and simple setup.
- **Enhanced:** Yield, sensitivity and specificity with optimized components.
- **Accurate:** Blend of thermostable DNA polymerases with enhanced processivity and proofreading.
- **Confident:** Control primer pair and human genomic DNA template to perform control reactions and test template quality.
- **Efficient:** Perfect for cloning genes, mutational analysis and DNA sequencing.

Storage Conditions: Upon arrival, store all components at –30°C to –10°C, protected from light. For immediate use, components may be stored at 2–8°C, protected from light, for up to 3 months.

GoTaq® G2 Polymerase and Master Mixes

Product	Size	Conc.	Cat.#
GoTaq® G2 Flexi DNA Polymerase	100 u	5 u/µl	M7801
	500 u	5 u/µl	M7805
	2,500 u	5 u/µl	M7806
	10,000 u	5 u/µl	M7808
GoTaq® G2 DNA Polymerase	100 u	5 u/µl	M7841
	500 u	5 u/µl	M7845
	2,500 u	5 u/µl	M7848
GoTaq® G2 Green Master Mix	100 reactions		M7822
	1,000 reactions		M7823
GoTaq® G2 Colorless Master Mix	100 reactions		M7832
	1,000 reactions		M7833

For Laboratory Use.

Description: The second generation of GoTaq® products, GoTaq® G2 DNA Polymerase reliably amplifies a wide range of PCR templates and provides high-performance results due to improved manufacturing processes, increased reliability and consistency. The product is available in many formats to give you maximum flexibility, control and convenience for your PCR. For robust, routine PCR choose a standalone enzyme and buffer with or without magnesium, or for maximum convenience, choose an all-in-one master mix.

GoTaq® G2 DNA Polymerase is supplied with 5X Green GoTaq® Reaction Buffer and 5X Colorless GoTaq® Reaction Buffer. Both buffers contain $MgCl_2$ at a concentration of 7.5mM for a final concentration of 1.5mM in the 1X reaction.

GoTaq® G2 Flexi DNA Polymerase is supplied with 5X Green GoTaq® Flexi Buffer and 5X Colorless GoTaq® Flexi Buffer and 25mM $MgCl_2$.

GoTaq® G2 Green and Colorless Master Mixes are ready-to-use. The green and colorless 2X master mixes contain all necessary components for robust, reliable PCR, including GoTaq® G2 DNA Polymerase. Add template, primers and go.

The GoTaq® G2 and G2 Flexi DNA Polymerases are supplied in a proprietary formulation containing 50% glycerol, with buffers designed for enhanced amplification. The enzyme is a full-length form of *Taq* DNA polymerase that exhibits 5′→3′ exonuclease activity. The 5X Green GoTaq® Reaction and Flexi Buffers contain two dyes (blue and yellow) that separate during electrophoresis to indicate migration progress. The colorless buffer is used when direct fluorescence or absorbance readings are required without prior purification of amplified DNA from the PCR.

Features:

- **Direct-to-gel amplification buffer.**
- **Two buffer systems available to match your needs:**
  - Reaction buffer with $MgCl_2$ to simplify reaction setup.
  - Flexi buffer and separate $MgCl_2$ to enable optimization.
- **Risk-Free:** Backed by the Promega PCR Satisfaction Guarantee.

Storage Conditions: Store at –30°C to –10°C.

Available in the Helix® on-site stocking system

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GoTaq® Amplification Family

Product	Size	Conc.	Cat.#
GoTaq® Flexi DNA Polymerase	100 u	5 u/µl	M8291
	500 u	5 u/µl	M8295
	2,500 u	5 u/µl	M8296
	5,000 u	5 u/µl	M8297
	10,000 u	5 u/µl	M8298
GoTaq® DNA Polymerase	100 u	5 u/µl	M3001
	500 u	5 u/µl	M3005
	2,500 u	5 u/µl	M3008
GoTaq® Green Master Mix	100 reactions		M7122
	1,000 reactions		M7123
GoTaq® Colorless Master Mix	100 reactions		M7132
	1,000 reactions		M7133

For Laboratory Use.

Description: Experience improved PCR performance with GoTaq® DNA Polymerase products. GoTaq® DNA Polymerase is a proprietary formulation of *Taq* DNA polymerase that gives robust amplification equal to and in some cases superior to that of standard *Taq* DNA polymerase. GoTaq® DNA Polymerase comes in a variety of formulations to give you maximum flexibility, control and convenience.

GoTaq® Flexi DNA Polymerase allows you to optimize enzyme and magnesium concentration in your PCR. The supplied 5X Green and Colorless Flexi Reaction Buffers do not contain magnesium. A separate tube of 25mM $MgCl_2$ is supplied, giving you maximum control over your reaction conditions. $MgCl_2$ is also available separately.

GoTaq® DNA Polymerase provides improved amplification with the convenience of reaction buffers containing magnesium. The 5X GoTaq® Green and Colorless Reaction Buffers supplied with GoTaq® DNA Polymerase contain $MgCl_2$ at a concentration of 7.5mM, for a final concentration of 1.5mM in the 1X reaction.

The 5X Green and 5X Colorless Reaction Buffers supplied with GoTaq® enzymes allow you to go directly from thermal cycler to gel analysis. These buffers contain a compound that increases sample density so that samples sink easily into wells of an agarose gel. The green buffer also contains two dyes (yellow and blue) that separate to allow easy monitoring during electrophoresis. The blue dye comigrates at the same rate as 3–5kb DNA fragments in a 1% agarose gel. The yellow dye migrates ahead of primers (<50bp). Use the green reaction buffer for direct-to-gel analysis after amplification and the colorless reaction buffer for post-amplification analysis by fluorescence or absorbance without prior DNA purification.

For ultimate convenience, choose GoTaq® Colorless Master Mix or GoTaq® Green Master Mix. Both are premixed, ready-to-use 2X solutions that contain GoTaq® DNA Polymerase, dNTPs, $MgCl_2$ and reaction buffer at optimal concentrations for efficient amplification of DNA templates by PCR. GoTaq® Green Master Mix also includes two dyes (blue and yellow) that allow monitoring of progress during electrophoresis. GoTaq® Colorless Master Mix has the same formulation as the GoTaq® Green Master Mix but does not include the dyes. Both include Nuclease-Free Water. Reactions assembled with the GoTaq® Master Mixes have sufficient density for direct loading onto agarose gels.

Features:

- **Improve Performance:** Experience better PCR performance with this buffer and enzyme formulation. With GoTaq® Flexi DNA Polymerase, you have the option to titrate Mg^{2+} concentration in your reactions.
- **Improve Productivity:** Go directly from PCR to gel analysis. Green GoTaq® Reaction Buffer serves as both reaction buffer and gel-loading solution.
- **Keep Your Cycling Conditions:** Directly substitute GoTaq® products, with either Colorless or Green Reaction Buffer, in your current PCR application—no need to change cycling parameters.
- **Use With PCR Enhancers:** GoTaq® DNA Polymerase is compatible with PCR enhancers such as betaine and DMSO. Neither compound affects the color or characteristics of the GoTaq® Green Reaction Buffer.
- **Fast and Convenient:** GoTaq® Green Master Mix offers the ultimate in convenience. Reactions can be set up in less than a minute; simply add your template, water and primers and go!

Storage Conditions: Store enzymes at –30°C to –10°C. GoTaq® Green Master Mix can be stored at 4°C for 6 weeks.

GoTaq® Reaction Buffers and Magnesium Chloride

Product	Size	Conc.	Cat.#
5X Green GoTaq® Reaction Buffer	20 ml		M7911
5X Colorless GoTaq® Reaction Buffer	20 ml		M7921
5X Colorless GoTaq® Flexi Reaction Buffer	20 ml		M8901
5X Green GoTaq® Flexi Reaction Buffer	20 ml		M8911
Magnesium Chloride Solution	1.5 ml	25 mM	A3511
	25 ml	25 mM	A3513

For Laboratory Use.

Description: The 5X Green GoTaq® Reaction Buffer contains two dyes (a blue dye and a yellow dye) that separate during electrophoresis to show migration progress. The buffer also contains a compound that increases sample density. This means that samples can be loaded directly onto gels without the need for loading dye. The blue dye migrates at the same rate as a 3–5kb DNA fragment in a 1% agarose gel. The yellow dye migrates at a rate faster than primers (<50bp) in a 1% agarose gel. The 5X Colorless GoTaq® Reaction Buffer has the same formulation as the 5X Green GoTaq® Reaction Buffer but does not contain dyes and is recommended for any applications where absorbance or fluorescence measurements are necessary prior to PCR cleanup. Both buffers are supplied at pH 8.5.

Cat.# M7911 and M7921 contain $MgCl_2$ at a concentration of 7.5mM for a final concentration of 1.5mM in the 1X reaction. Cat.# M8901 and M8911 do not contain magnesium.

Storage Conditions: Store at –30°C to –10°C.

GoTaq® PCR Core System

Product	Size	Cat.#
GoTaq® PCR Core System I	200 reactions	M7660
For Laboratory Use.		

Description: The GoTaq® PCR Core System I is designed for exponential amplification of specific regions of DNA using the polymerase chain reaction. The system includes GoTaq® DNA polymerase and PCR Nucleotide Mix, along with high-performance buffers and magnesium chloride. All components are performance-tested in PCR and are sufficient for 200 reactions.

Features:

- **Convenience:** PCR-tested components are provided in optimized volumes for 200 reactions.
- **Flexibility:** Optimization tools are provided for reaction flexibility.
- **Performance Guarantee:** Promega PCR systems, enzymes and reagents are proven in PCR to ensure reliable, high-performance results. If you are not completely satisfied with any Promega PCR product, we will send a replacement or refund your account.

Storage Conditions: Store all components at –30°C to –10°C.

PCR Master Mix

Product	Size	Conc.	Cat.#
PCR Master Mix	10 reactions	2 X	M7501
	100 reactions	2 X	M7502
	1,000 reactions	2 X	M7505
For Laboratory Use.			

Description: PCR Master Mix is a premixed, ready-to-use solution containing *Taq* DNA polymerase, dNTPs, $MgCl_2$ and reaction buffer at optimal concentrations for efficient amplification of DNA templates by PCR. The PCR Master Mix is optimized for use in routine PCR for amplifying DNA templates in the range of 0.2–2kb.

Features:

- **Fast:** Set up reactions in less than a minute.
- **Sensitive:** Amplify as few as two copies of target template.
- **Convenient:** One tube, one pipetting step.
- **Complete:** Reagents, including *Taq* DNA polymerase, $MgCl_2$, dNTPs and buffers, in one tube.
- **Scalable:** Set up 10µl, 25µl or 50µl reactions.
- **Stable:** Store at 4°C for up to 3 months.
- **Performance Guaranteed:** Promega PCR systems, enzymes and reagents are proven in PCR to ensure reliable, high-performance results. If you are not completely satisfied with any Promega PCR product, we will send a replacement or refund your account.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –20°C. PCR Master Mix can be stored at 4°C for up to 3 months.

Pfu DNA Polymerase

Product	Size	Conc.	Cat.#
Pfu DNA Polymerase	100 u	2–3 u/µl	M7741
	500 u	2–3 u/µl	M7745

For Research Use Only. Not for Use in Diagnostic Procedures. Product may not be available in all countries. Please contact your local representative for more information.

Description: *Pfu* DNA Polymerase is a thermostable enzyme of approximately 90kDa isolated from *Pyrococcus furiosus*. The enzyme replicates DNA at 75°C, catalyzing the polymerization of nucleotides into duplex DNA in the 5′→3′ direction in the presence of magnesium. *Pfu* DNA Polymerase also possesses 3′→5′ exonuclease (proofreading) activity. Base misinsertions that may occur during polymerization are rapidly excised by the proofreading activity of the polymerase. Consequently, *Pfu* DNA Polymerase is recommended for use in PCR and primer extension reactions that require high-fidelity synthesis. *Pfu* DNA Polymerase-generated PCR fragments are blunt-ended.

Pfu DNA Polymerase 10X Reaction Buffer with $MgSO_4$: 200mM Tris-HCl (pH 8.8 at 25°C), 100mM KCl, 100mM $(NH_4)_2SO_4$, 20mM $MgSO_4$, 1.0% Triton® X-100 and 1mg/ml nuclease-free BSA.

Features:

- **High Fidelity:** *Pfu* DNA Polymerase exhibits the lowest error rate of any thermostable DNA polymerase.
- **Complete:** Provided with 10X buffer containing 20mM $MgSO_4$.
- **Performance Guarantee:** Promega PCR systems, enzymes and reagents are proven in PCR to ensure reliable, high-performance results. If you are not completely satisfied with any Promega PCR product, we will send a replacement or refund your account.

Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system
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PCR Nucleotide Mix

Product	Size	Conc.	Cat.#
PCR Nucleotide Mix	200 µl	10 mM	C1141
	1,000 µl	10 mM	C1145
	200 µl	25mM	U1431
	1,000 µl	25mM	U1432

For Laboratory Use.

Description: High-quality deoxynucleotide triphosphates (dNTPs) are critical for PCR efficacy. The PCR Nucleotide Mix is a premixed solution containing the sodium salts of dATP, dCTP, dGTP and dTTP. PCR Nucleotide Mix is manufactured under cGMP conditions and has equimolar amounts of each dNTP to ensure optimal PCR. Adding dNTPs as a mix also simplifies pipetting steps and reduces the risk of contamination.

There are two ready-to-use formulations available:

- A premixed solution with each nucleotide at a concentration of 10mM in water at pH 7.5; the total concentration of nucleotides is 40mM.
- A premixed solution with each nucleotide at a concentration of 25mM in water at pH 7.5; the total concentration of nucleotides is 100mM.

Features:

- **Optimized and Pretested in PCR:** Equimolar amounts of each dNTP ensure optimal PCR.
- **Convenient:** Add 1µl for 50µl PCR.
- **Easy to Use:** Reduced pipetting steps contribute to ease-of-use and reduce the risk of contamination.
- **Performance Guaranteed:** Promega PCR systems, enzymes and reagents are proven in PCR to ensure reliable, high-performance results. If you are not completely satisfied with any Promega PCR product, we will send a replacement or refund your account.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**
- **cGMP-Manufactured:** Achieve lot-to-lot product consistency.
- **Two Concentrations Available:** 10mM and 25mM.

Storage Conditions: Store at –30°C to –10°C.

dNTP Mix

Product	Size	Conc.	Cat.#
dNTP Mix	200 µl	10 mM	U1511
	1,000 µl	10 mM	U1515

For Laboratory Use.

Description: dNTP Mix is a premixed solution containing sodium salts of dATP, dCTP, dGTP and dTTP, each at 10mM in water at pH 7.5; the total concentration of nucleotides is 40mM. One microliter of the dNTP Mix in a 50µl reaction will give a final dNTP concentration of 200µM for each dNTP.

Features:

- **High Purity:** dNTPs are >99% triphosphate.
- **Easy to Use:** Reduced pipetting steps contribute to ease of use and reduce the risk of contamination.

Storage Conditions: Store at –20°C. Avoid exposure to frequent temperature changes.

Deoxynucleotide Triphosphates (dNTPs)

Product	Size	Conc.	Cat.#
dATP	25 µmol	100 mM	U1205
	40 µmol	100 mM	U1201
	200 µmol	100 mM	U1202
dGTP	25 µmol	100 mM	U1215
	40 µmol	100 mM	U1211
	200 µmol	100 mM	U1212
dCTP	25 µmol	100 mM	U1225
	40 µmol	100 mM	U1221
	200 µmol	100 mM	U1222
dTTP	25 µmol	100 mM	U1235
	40 µmol	100 mM	U1231
	200 µmol	100 mM	U1232
Set of dATP, dCTP, dGTP, dTTP	10µmol each	100 mM	U1330
	25 µmol each	100 mM	U1420
	40µmol each	100 mM	U1240
	200 µmol	100 mM	U1410

For Laboratory Use.

Description: High-quality deoxynucleotide triphosphates (dNTPs) are critical for the success of many key procedures such as cDNA synthesis, sequencing and labeling. Promega dNTPs have greater than 99% triphosphate content and are provided at a concentration of 100mM in water at pH 7.5.

Features:

- **Dependable:** PCR-tested deoxynucleotides ensure optimal performance with all Promega amplification enzymes.
- **Consistent:** dNTPs are >99% pure, allowing highly consistent results.
- **Convenient:** Supplied at a convenient concentration (100mM in water) for ease-of-use in PCR and other applications.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –30°C to –10°C. Avoid exposure to frequent temperature changes.

PCR Amplifications From Each Size of Individual dNTPs.
Each catalog number supplies each individual dNTP at 100mM. Reactions are based on 200µM each dNTP in a 50µl reaction.

Cat.#	Quantity	Volume	Reactions
U1330, U1335	10 µmol each	100 µl each	1,000
U1420	25 µmol each	250 µl each	2,500
U1240, U1245	40 µmol each	400 µl each	4,000
U1410	200 µmol each	2 × 1,000 µl each	20,000

9479LA

Deoxyuridine Triphosphate (dUTP)

Product	Size	Conc.	Cat.#
dUTP	40 µmol	100 mM	U1191
Set of dATP, dCTP, dGTP, dUTP	10µmol each	100 mM	U1335
	40µmol each	100 mM	U1245

For Laboratory Use.

Description: High-quality deoxynucleotide triphosphates (dNTPs) are critical for the success of many key procedures such as cDNA synthesis, sequencing and labeling. Promega dNTPs have greater than 99% triphosphate content and are provided at a concentration of 100mM in water at pH 7.5.

dUTP (2′-Deoxyuridine, 5′-Triphosphate) can be used in place of dTTP in PCR and RT-PCR protocols to prevent carryover from previous amplifications. The substitution of dUTP for dTTP in PCR results in uracil-containing PCR products that are suitable for most standard applications. The enzyme uracil-N-glycosylase (UNG, also referred to as UDG) can be added to a PCR premix to excise uracil from any contaminating PCR product, thereby preventing false positives. Each lot of dUTP is function-tested to ensure specific DNA amplification and the absence of nuclease activity.

Features:

- **Dependable:** PCR-tested deoxynucleotides ensure optimal performance with all Promega amplification enzymes.
- **Consistent:** dUTP is ≥99% triphosphate, allowing highly consistent results.
- **Convenient:** Supplied at a convenient concentration (100mM in water) for ease-of-use in PCR and other applications.

Storage Conditions: Store at –20°C. Avoid exposure to frequent temperature changes.

Available in the Helix® on-site stocking system

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qPCR and RT-qPCR

GoTaq® Real-Time qPCR and RT-qPCR Systems for Probe-Based Detection

Product	Size	Cat.#
GoTaq® Probe qPCR Master Mix	2 ml	A6101
	10 ml	A6102
GoTaq® Probe 2-Step RT-qPCR System	2 ml	A6110
GoTaq® Probe 1-Step RT-qPCR System	2 ml	A6120
	12.5 ml	A6121

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The GoTaq® Probe qPCR Master Mix is optimized for quantitative PCR assays in the hydrolysis probe detection format. The master mix is provided as a ready-to-use, stabilized 2X formulation that includes all components for qPCR (except template, primers and probe). This master mix does not contain a reference dye; however, a separate tube of carboxy-X-rhodamine (CXR) reference dye is included with this system, allowing users to add reference dye to amplification reactions if desired.

The GoTaq® Probe qPCR Master Mix provides resistance to a wide range of PCR inhibitors. This formulation uses antibody-mediated hot-start chemistry, allowing reaction setup to be performed at room temperature. The master mix also employs rapid hot-start activation and processive enzymes, making it compatible with both standard and fast instrument cycling programs.

The GoTaq® Probe 2-Step RT-qPCR System is optimized for quantitative PCR assays in the hydrolysis probe detection format. The system facilitates detection and relative quantification of RNA expression levels via a two-step RT-qPCR method using integrated components:

- GoScript™ Reverse Transcription System
- GoTaq® Probe qPCR Master Mix

The GoScript™ Reverse Transcription System includes an optimized reaction buffer and reverse transcriptase that enable efficient synthesis of first-strand cDNA in preparation for PCR amplification. The cDNA product may be added directly to downstream qPCR amplification reactions.

The GoTaq® Probe 1-Step RT-qPCR System is optimized for quantitative PCR assays in the hydrolysis probe detection format. The system enables detection and relative quantification of RNA expression levels using a one-step RT-qPCR method, combining GoScript™ Reverse Transcriptase and GoTaq® Probe qPCR Master Mix in single-step real-time amplification reactions.

The GoScript™ RT Mix for 1-Step RT-qPCR (50X) combines optimized amounts of GoScript™ Reverse Transcriptase, RNasin® Plus RNase Inhibitor, dUTP and additives to enhance single-step reactions.

Features:

- **Superior Performance:** Sensitive detection on any real-time instrument.
- **Enhanced Stability:** Room-temperature setup makes the system suitable for automation and high-throughput detection.
- **Versatility:** Compatible with both fast and standard cycling methods.
- **Performance Guarantee:** Promega PCR systems, enzymes and reagents are proven in PCR to ensure reliable, high-performance results. If you are not completely satisfied with any Promega PCR product, we will send a replacement or refund your account.

Storage Conditions: Store all components between –30°C and –10°C. Protect components from light at all times. For best results, mix thawed solutions gently to minimize aeration and foaming, and keep on ice. For short-term storage and frequent use, the GoTaq® qPCR Master Mix, 2X, may be kept at 2–8°C for up to 3 months if protected from light.

GoTaq® Real-Time qPCR and RT-qPCR Systems for Dye-Based Detection

Product	Size	Cat.#
GoTaq® qPCR Master Mix	5 ml	A6001
	25 ml	A6002
GoTaq® 2-Step RT-qPCR System	5 ml	A6010
GoTaq® 1-Step RT-qPCR System	5 ml	A6020
Available Separately		
CXR Reference Dye	100 µl	C5411

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The GoTaq® qPCR Master Mix is a ready-to-use 2X master mix for use in real-time quantitative PCR (qPCR and RT-qPCR). The system contains BRYT Green® Dye, a novel fluorescent DNA-binding dye with minimal PCR inhibition for maximum PCR efficiency and greater fluorescence enhancement upon binding to double-stranded DNA than SYBR® Green I. Containing the GoTaq® Hot Start Polymerase, optimized buffer and proprietary dye, the GoTaq® qPCR Master Mix provides robust real-time PCR with earlier quantification cycle values and broad-range detection for increased reliability, reproducibility and sensitivity.

The GoTaq® 2-Step RT-qPCR System is a reagent system for quantitative analysis of RNA using a two-step reverse transcription-quantitative PCR (RT-qPCR) protocol. The components and protocol allow robust, reliable cDNA synthesis of a full range of rare and abundant transcripts, even in the presence of inhibitors, using the GoScript™ Reverse Transcription System and quantification using the GoTaq® qPCR Master Mix.

The GoTaq® 1-Step RT-qPCR System is a reagent system for quantitative analysis of RNA using a one-step reverse transcription-quantitative PCR (RT-qPCR) protocol in a single tube. The BRYT Green® Dye and optimized buffer formulations improve data accuracy and sensitivity of low-level targets.

Features:

- **Brighter Signal:** Sensitive detection for earlier quantification of low- and high-copy-number targets.
- **Enhanced Stability:** Room-temperature setup makes the systems suitable for automation and high-throughput detection.
- **Versatility:** Compatible with both fast and standard qPCR cycling methods.
- **Robustness:** High-efficiency, full-length cDNA synthesis in the presence of inhibitors.
- **Performance Guarantee:** Promega PCR systems, enzymes and reagents are proven in PCR to ensure reliable, high-performance results. If you are not completely satisfied with any Promega PCR product, we will send a replacement or refund your account.

Storage Conditions: Upon arrival, store all components at –30°C to –10°C, protected from light. For immediate use, components may be stored at 2–8°C, protected from light, for up to 3 months.

MOPS/EDTA Buffer

Product	Size	Cat.#
MOPS/EDTA Buffer	3 × 10 ml	Y5101

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: MOPS/EDTA Buffer is provided at pH 7.4 for resuspending and diluting Iso-dC-containing primers and templates used in qPCR and RT-qPCR systems. Iso-dC-containing primers are sensitive to pH below 7.0.

Storage Conditions: Store at any temperature.

RT-PCR

GoScript™ Reverse Transcription System

Product	Size	Cat.#
GoScript™ Reverse Transcription System	50 reactions	A5000
	100 reactions	A5001
Available Separately		
GoScript™ Reverse Transcriptase	100 reactions	A5003
	500 reactions	A5004
GoScript™ Reverse Transcription Mix, Oligo(dT)	50 reactions	A2790
	100 reactions	A2791
GoScript™ Reverse Transcription Mix, Random Primers	50 reactions	A2800
	100 reactions	A2801

A5000, A5001, A2790, A2791, A2800, A2801 For Research Use Only. Not for Use in Diagnostic Procedures. A5003, A5004 For Laboratory Use.

Description: The GoScript™ Reverse Transcription System includes a reverse transcriptase and a specialized set of reagents for efficient synthesis of first-strand cDNA optimized for quantitative PCR amplification. GoScript™ Reverse Transcriptase uses M-MLV Reverse Transcriptase and state-of-the-art buffer technology to deliver robust, reliable cDNA synthesis of a full range of rare and abundant transcripts, even in the presence of inhibitors. GoScript™ Reverse Transcriptase is qualified for use in qPCR, including GoTaq® qPCR systems.

Features:

- Available as a standalone enzyme, a complete reverse transcription kit or as a master mix with Oligo(dT) or Random Primers.
- Achieve sensitive transcription of both high-copy and low-copy messages.
- Transcribe short and long transcripts; process through secondary structure.

Storage Conditions: Store at –30°C to –10°C.

Available in the Helix® on-site stocking system

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ImProm-II™ Reverse Transcription System

Product	Size	Cat.#
ImProm-II™ Reverse Transcription System	100 reactions	A3800
Available Separately		
ImProm-II™ Reverse Transcriptase	10 reactions	A3801
	100 reactions	A3802
	500 reactions	A3803

A3800 For Research Use Only. Not for Use in Diagnostic Procedures. A3801, A3802, A3803 For Laboratory Use.

Description: The ImProm-II™ Reverse Transcription System produces efficient, robust synthesis of first-strand cDNA in preparation for PCR amplification. The components of the ImProm-II™ Reverse Transcription System can be used to reverse transcribe RNA templates starting with total RNA, poly(A)+ mRNA or synthetic transcript RNA. The optimized reaction buffer and powerful ImProm-II™ Reverse Transcriptase provided in the ImProm-II™ System together enable robust, full-length cDNA synthesis for the reproducible analysis of rare or long messages. The cDNA synthesis conditions were formulated for standalone applications or for easy transition to gene-specific target amplification. An aliquot of the reverse transcription reaction (1–20µl) can be amplified directly using *Taq* DNA polymerase in coupled or uncoupled PCR.

Features:

- **Amenable to Full-Length RT-PCR:** Reverse transcribe long RNA templates up to 8.9kb.
- **Microarray-Compatible:** Can be used to incorporate regular, Cy®3-modified, Cy®5-modified and amino-allyl-modified nucleotides.
- **Easy to Use:** System provides all reagents necessary for efficient reverse transcription.
- **Scalable and Flexible:** 1–20µl of the initial reverse transcription reaction may be used in subsequent PCR, and the optimized buffer allows coupled RT-PCR.
- **RT Provided with 5X Reaction Buffer:** 250mM Tris-HCl (pH 8.3 at 25°C), 375mM KCl and 50mM DTT. A 25mM $MgCl_2$ Solution is included.
- **Versatile:** Use with your thermostable DNA polymerase of choice.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –20°C. Store Positive Control RNA at –70°C.

Reverse Transcription System

Product	Size	Conc.	Cat.#
Reverse Transcription System	100 reactions		A3500
Available Separately			
Magnesium Chloride Solution	1.5 ml	25 mM	A3511
Reverse Transcription 10X Buffer	1.4 ml		A3561

A3500 For Research Use Only. Not for Use in Diagnostic Procedures. A3511, A3561 For Laboratory Use.

Description: The Reverse Transcription System provides reagents to efficiently reverse transcribe RNA into cDNA in 15 minutes. The cDNA prepared from each reaction may be used directly in multiple PCR amplifications using *Taq* DNA polymerase. The AMV Reverse Transcriptase synthesizes single-stranded cDNA from total or poly(A)+ RNA. Both Oligo$(dT)_{15}$ and Random Primers are included, allowing cDNA synthesis from virtually any RNA source. The system contains sufficient reagents for 100 cDNA synthesis reactions, processing 1µg of RNA per reaction. Each cDNA synthesis reaction can be divided and used in up to 20 separate PCR amplifications. A polyadenylated 1.2kb RNA transcript is provided as a control template for cDNA synthesis.

Features:

- **Speed:** Efficiently reverse transcribe poly(A)+ mRNA or total RNA in 15 minutes.
- **Convenience:** PCR-compatible components are provided in optimized volumes for 100 reactions.
- **Positive Controls:** A polyadenylated RNA transcript is provided to help troubleshoot RT-PCR parameters.

Storage Conditions: Store at –20°C. Store Positive Control RNA at –70°C.

AccessQuick™ RT-PCR System

Product	Size	Cat.#
AccessQuick™ RT-PCR System	20 reactions	A1701
	100 reactions	A1702
	500 reactions	A1703

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The AccessQuick™ RT-PCR System is an easy and convenient master mix for one-tube RT-PCR. The system increases the convenience of performing RT-PCR by combining the following components in a single tube: *Tfl* DNA Polymerase, dNTPs, magnesium sulfate and reaction buffer. The AMV RT enzyme is provided in a separate tube to allow important no-RT control reactions. The AccessQuick™ Master Mix is simply added to RNA templates in reaction vials, followed by the AMV RT, primers and water. The AccessQuick™ RT-PCR Master Mix is intended for routine RT-PCR applications that have been previously optimized and do not require extreme conditions.

Features:

- **Maximum Convenience:** Save yourself four pipetting steps. Simply combine the AccessQuick™ Master Mix, AMV RT, your gene-specific primers, your RNA template and water. Separate AMV RT allows important no-RT control reactions.
- **Less Template:** Amplify zeptomole (10^{-21}mol) levels of RNA.
- **No Buffer Additions Required:** Set up reactions in a single tube, place in the thermal cycler and come back later for results—no additions between the reverse transcription and DNA amplification steps.
- **Stability:** System components are stable over many freeze-thaw cycles.

Storage Conditions: Store all system components at –20°C.

Access RT-PCR System

Product	Size		Cat.#
Access RT-PCR Introductory System	20 reactions		A1260
Access RT-PCR System	100 reactions		A1250
	500 reactions		A1280
Available Separately	**Size**	**Conc.**	**Cat.#**
AMV Reverse Transcriptase	300 u	10 u/µl	M5101
	1,000 u	10 u/µl	M5108
AMV Reverse Transcriptase (HC)	600 u	20–25 u/µl	M9004

A1260, A1250, A1280 For Research Use Only. Not for Use in Diagnostic Procedures.
M5101, M5108, M9004 For Laboratory Use.

Description: The Access RT-PCR System is designed for reverse transcription (RT) and PCR amplification of a specific target RNA from total RNA or mRNA. This one-tube, two-enzyme system provides sensitive, quick and reproducible analysis of even rare RNAs. The system uses AMV Reverse Transcriptase (AMV RT) from Avian Myeloblastosis Virus for first-strand DNA synthesis and thermostable *Tfl* DNA polymerase from *Thermus flavus* for second-strand cDNA synthesis and DNA amplification. The Access RT-PCR System includes an optimized single-buffer system that permits extremely sensitive detection of RNA transcripts without buffer additions between the reverse transcription and PCR amplification steps. This simplifies the procedure and reduces the potential for contamination. In addition, the improved performance of AMV Reverse Transcriptase at elevated temperatures in the AMV/*Tfl* 5X Reaction Buffer minimizes problems encountered with RNA secondary structures.

Features:

- **Maximum Control:** Separate tubes of each component allow you to control every step of the reaction. You can optimize Mg^{2+} and perform no-reverse transcriptase control reactions.
- **Less Template:** Detect message from as little as 1pg of total RNA or mRNA.
- **No Buffer Additions Required:** The AMV/*Tfl* 5X Reaction Buffer results in optimal enzyme activity without buffer additions between the reverse transcription and DNA amplification steps.
- **Performance-Tested System:** Promega PCR Systems, enzymes and reagents are proven in PCR to ensure reliable, high-performance results. If you are not completely satisfied with any Promega PCR product, we will send a replacement or refund your account.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store all system components at –20°C. For long-term storage, the Positive Control RNA with Carrier must be stored at –70°C.

AMV Reverse Transcriptase

Product	Size	Conc.	Cat.#
AMV Reverse Transcriptase	300 u	10 u/µl	M5101
	1,000 u	10 u/µl	M5108
AMV Reverse Transcriptase (HC)	600 u	20–25 u/µl	M9004

For Laboratory Use.

Description: Avian Myeloblastosis Virus Reverse Transcriptase (AMV RT) catalyzes DNA polymerization using template DNA, RNA or RNA:DNA hybrids. The enzyme requires a primer (DNA primers are more efficient than RNA primers) as well as Mg^{2+} or Mn^{2+}. The enzyme possesses an intrinsic RNase H activity. Both nonionic detergents and sulfhydryl compounds stabilize the enzyme activity in vitro.

Features:

- **High Concentration:** Cat.# M9004 contains 600 units of AMV RT at 20–25u/µl.
- **5X Reaction Buffer:** 250mM Tris-HCl (pH 8.3 at 25°C), 250mM KCl, 50mM $MgCl_2$, 2.5mM spermidine, 50mM DTT.
- **Temperature Stability:** AMV RT is the preferred reverse transcriptase for templates with high secondary structure due to its stability at higher reaction temperatures (37–58°C).

Storage Conditions: Store at –20°C.

M-MLV Reverse Transcriptase

Product	Size	Conc.	Cat.#
M-MLV Reverse Transcriptase	10,000 u	200 u/µl	M1701
	50,000 u	200 u/µl	M1705
M-MLV Reverse Transcriptase Buffer Pack	2 × 1 ml		M5313

For Laboratory Use.

Description: Moloney Murine Leukemia Virus Reverse Transcriptase (M-MLV RT) is an RNA-dependent DNA polymerase that can be used in cDNA synthesis with long messenger RNA templates (>5kb). The enzyme is a product of the *pol* gene of M-MLV and consists of a single subunit with a molecular weight of 71kDa. The RNase H activity of M-MLV RT is weaker than that of the commonly used Avian Myeloblastosis Virus (AMV) reverse transcriptase.

Features:

- **Provided with 5X Reaction Buffer:** 250mM Tris-HCl (pH 8.3 at 25°C), 375mM KCl, 15mM $MgCl_2$, 50mM DTT.
- **Heat-Inactivated:** M-MLV RT is inactivated by heating at 70°C for 10 minutes.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system

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M-MLV Reverse Transcriptase, RNase H Minus

Product	Size	Conc.	Cat.#
M-MLV Reverse Transcriptase, RNase H Minus	10,000 u	100–200 u/µl	M5301

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Moloney Murine Leukemia Virus Reverse Transcriptase, RNase H Minus (M-MLV RT [H–]), is an RNA-dependent DNA polymerase that can be used in cDNA synthesis with long messenger RNA templates (>5kb). This form of M-MLV Reverse Transcriptase is genetically altered to remove the associated RNase H activity. Although many researchers are successful in using M-MLV RT (H+) for analytical and some preparative cDNA applications, reverse transcriptases lacking RNase H activity provide another option to prepare long cDNAs and libraries containing a high percentage of full-length cDNA.

Features:

- **RNase H Minus:** Provides optimal conditions to prepare full-length cDNA from long RNA templates.
- **Provided with 5X Reaction Buffer:** 250mM Tris-HCl (pH 8.3 at 25°C), 375mM KCl, 15mM $MgCl_2$, 50mM DTT.
- **Heat-Inactivated:** M-MLV RT is inactivated by heating at 70°C for 10 minutes.

Storage Conditions: Store at –20°C.

M-MLV Reverse Transcriptase, RNase H Minus, Point Mutant

Product	Size	Cat.#
M-MLV Reverse Transcriptase, RNase H Minus, Point Mutant	2,500 u	M3681
	10,000 u	M3682
	50,000 u	M3683

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Moloney Murine Leukemia Virus Reverse Transcriptase, RNase H Minus (M-MLV RT [H–]), Point Mutant, is an RNA-dependent DNA polymerase that can be used for cDNA synthesis with long RNA templates (>5kb). The lack of RNase H activity is beneficial for this application, as RNase H can start to degrade templates when incubation times are long, as they may be when synthesizing long cDNAs. Although many researchers are successful in using M-MLV RT (H+) for analytical and some preparative cDNA applications, reverse transcriptases lacking RNase H activity provide another option to prepare long cDNAs and libraries containing a high percentage of full-length cDNA.

Features:

- **RNase H Minus:** Provides optimal conditions to prepare full-length cDNA from long RNA templates.
- **Temperature Stability:** Thermostability of this point mutant minimizes problems associated with RNA secondary structure.
- **Increased Polymerase Activity:** M-MLV RT (H–), Point Mutant, gives higher yields of cDNA compared with the deletion mutant (Cat.# M5301).
- **Provided with 5X Reaction Buffer:** 250mM Tris-HCl (pH 8.3 at 25°C), 375mM KCl, 15mM $MgCl_2$, 50mM DTT.
- **Broad Working Range:** More tolerance to variations in enzyme and substrate concentrations means improved consistency in performance.

Storage Conditions: Store at –20°C.

Deoxynucleotide Triphosphates (dNTPs)

Product	Size	Conc.	Cat.#
dATP	25 µmol	100 mM	U1205
	40 µmol	100 mM	U1201
	200 µmol	100 mM	U1202
dGTP	25 µmol	100 mM	U1215
	40 µmol	100 mM	U1211
	200 µmol	100 mM	U1212
dCTP	25 µmol	100 mM	U1225
	40 µmol	100 mM	U1221
	200 µmol	100 mM	U1222
dTTP	25 µmol	100 mM	U1235
	40 µmol	100 mM	U1231
	200 µmol	100 mM	U1232
Set of dATP, dCTP, dGTP, dTTP	10µmol each	100 mM	U1330
	25 µmol each	100 mM	U1420
	40µmol each	100 mM	U1240
	200 µmol	100 mM	U1410

For Laboratory Use.

Description: High-quality deoxynucleotide triphosphates (dNTPs) are critical for the success of many key procedures such as cDNA synthesis, sequencing and labeling. Promega dNTPs have greater than 99% triphosphate content and are provided at a concentration of 100mM in water at pH 7.5.

Features:

- **Dependable:** PCR-tested deoxynucleotides ensure optimal performance with all Promega amplification enzymes.
- **Consistent:** dNTPs are >99% pure, allowing highly consistent results.
- **Convenient:** Supplied at a convenient concentration (100mM in water) for ease-of-use in PCR and other applications.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –30°C to –10°C. Avoid exposure to frequent temperature changes.

PCR Amplifications From Each Size of Individual dNTPs.
Each catalog number supplies each individual dNTP at 100mM. Reactions are based on 200µM each dNTP in a 50µl reaction.

Cat.#	Quantity	Volume	Reactions
U1330, U1335	10 µmol each	100 µl each	1,000
U1420	25 µmol each	250 µl each	2,500
U1240, U1245	40 µmol each	400 µl each	4,000
U1410	200 µmol each	2 × 1,000 µl each	20,000

9479LA

Ribonucleotide Triphosphates (rNTPs)

Product	Size	Conc.	Cat.#
rATP, rCTP, rGTP, rUTP, each at 10mM in separate tubes	0.5 ml	10 mM	P1221
rATP, 10mM	0.5 ml	10 mM	P1132
rCTP, 10mM	0.5 ml	10 mM	P1142
rGTP, 10mM	0.5 ml	10 mM	P1152
rUTP, 10mM	0.5 ml	10 mM	P1162
rATP, 100mM	400 µl		E6011
rUTP, 100mM	400 µl		E6021
rGTP, 100mM	400 µl		E6031
rCTP, 100mM	400 µl		E6041
rCTP, rATP, rUTP, rGTP, 100mM each	4 × 400 µl		E6000

For Laboratory Use.

Description: Ribonucleotide Triphosphates (rNTPs) are provided in individual tubes and qualified for use with the Riboprobe® and HeLaScribe® Systems. The rNTPs are supplied in nuclease-free water. Purity is verified by HPLC analysis.

Features:

- **Pretested:** rNTPs are tested for functionality with in vitro transcription reactions.

Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system

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Universal RiboClone® cDNA Synthesis System

Product	Size	Cat.#
Universal RiboClone® cDNA Synthesis System	1 system	C4360
Available Separately		
Oligo(dT)$_{15}$ Primer	20 µg	C1101
Random Primers	20 µg	C1181
Spin Columns	10 each	C1281
EcoRI Adaptors	150 pmol	C1291
1.2kb Kanamycin Positive Control RNA	5 µg	C1381
Sephacryl® S-400	10 ml	V3181

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Universal RiboClone® cDNA Synthesis System contains the reagents required for synthesis of double-stranded cDNA from mRNA and subsequent ligation into a suitable vector. The system is based on the method described by Okayama and Berg with modifications by Gubler and Hoffman. First-strand synthesis is driven by AMV (Avian Myeloblastosis Virus) Reverse Transcriptase and either Random Primers or Oligo(dT)$_{15}$ Primer, followed directly by second-strand replacement synthesis using RNase H and DNA Polymerase I. After treatment with T4 DNA Polymerase to flush the ends, the double-stranded cDNA molecules are prepared for cloning by size fractionation and addition of EcoRI Adaptors. The resulting cDNA preparation then can be cloned into a suitable vector.

Features:

- **Convenient:** Contains all of the necessary reagents to synthesize double-stranded cDNA from RNA.
- **Flexible:** Both Oligo(dT)$_{15}$ Primer and Random Primers are included, providing you a choice of priming methods.

Storage Conditions: Store control RNA at –70°C. Store Sephacryl® S-400 at 2–10°C and Spin Columns at room temperature. Store other components at –20°C.

Oligonucleotides and Primers: cDNA Synthesis and Cloning

Product	Size	Cat.#
Oligo(dT)$_{15}$ Primer	20 µg	C1101
Random Primers	20 µg	C1181
EcoRI Adaptors	150 pmol	C1291

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Oligo(dT)$_{15}$ Primer is suitable for use as a primer for first-strand cDNA synthesis with a reverse transcriptase. The primer hybridizes to the poly(A) tail of mRNA.

Random Primers can be used for first-strand cDNA synthesis and cloning; they are also available as components of the Universal Riboclone® cDNA Synthesis System (Cat.# C4360) and Reverse Transcription System (Cat.# A3500). The primers are random hexadeoxynucleotides.

The EcoRI Adaptors consist of two complementary oligonucleotides: a 16mer and a 12mer phosphorylated at the 5′-end. The oligonucleotides are provided annealed in equimolar concentrations in water. The EcoRI Adaptors attach EcoRI "sticky" ends to blunt-ended DNA.

Storage Conditions: Store at –20°C.

pGEM®-T Vector Systems

Product	Size	Cat.#
pGEM®-T Vector System I	20 reactions	A3600
pGEM®-T Vector System II	20 reactions	A3610
For Research Use Only. Not for Use in Diagnostic Procedures.		

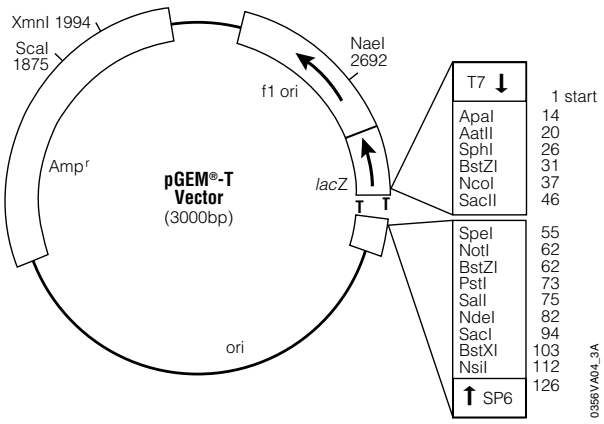
Description: The pGEM®-T Vector Systems are convenient systems to clone PCR products. The pGEM®-T Vector is prepared by cutting the pGEM®-5Zf(+) Vector with EcoRV and adding a 3´ terminal thymidine to both ends. These single 3´-T overhangs at the insertion site greatly improve the ligation efficiency of a PCR product into the plasmid by preventing recircularization of the vector and providing a compatible overhang for ligation of PCR products generated by thermostable polymerases that add a single deoxyadenosine, in a template-independent fashion, to the 3´-ends of amplified fragments.

The multiple cloning site is flanked by recognition sites for the restriction enzyme BstZI, allowing release of the insert by a single-enzyme digestion. Alternatively, a double digestion may be used to release the insert from the vector. The pGEM®-T Vector System II contains JM109 Competent Cells in addition to all of the pGEM®-T Vector System I components.

Features:

- **Rapid Ligation:** The provided 2X Rapid Ligation Buffer allows reactions to be completed in 1 hour at room temperature.
- **Blue/White Screening:** T7 and SP6 RNA polymerase promoters flank a multiple cloning region within the α-peptide coding region for β-galactosidase. Insertional inactivation of the α-peptide allows recombinant clones to be directly identified by color screening on indicator plates.
- **f1 Origin of Replication:** Allows preparation of single-stranded DNA.

Storage Conditions: Store competent cells at –70°C; store all other components at –20°C.



pGEM®-T Easy Vector Systems

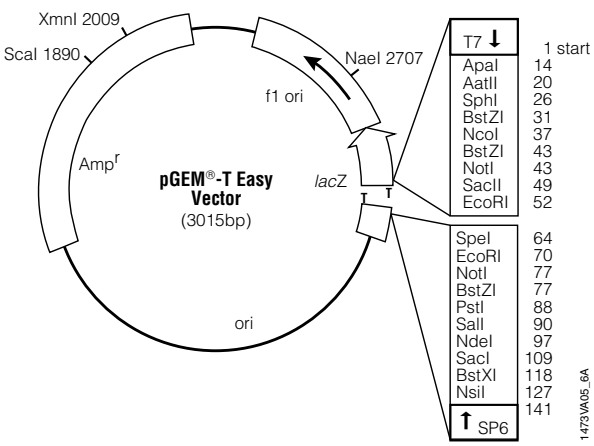
Product	Size	Cat.#
pGEM®-T Easy Vector System I	20 reactions	A1360
pGEM®-T Easy Vector System II	20 reactions	A1380
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The pGEM®-T Easy Vector Systems are convenient systems to clone PCR products. They offer all of the advantages of the pGEM®-T Vector Systems with the added convenience of recognition sites for EcoRI and NotI flanking the insertion site. Thus, several options exist to remove the desired insert DNA with a single restriction digestion. The pGEM®-T Easy Vector System II contains JM109 Competent Cells in addition to all of the pGEM®-T Easy Vector System I components.

Features:

- **Flexibility:** The multiple cloning site is flanked by restriction enzyme sites for BstZI, NotI and EcoRI, giving you three options to remove the insert with a single digest.
- **Rapid Ligation:** The provided 2X Rapid Ligation Buffer allows reactions to be completed in 1 hour at room temperature.
- **Blue/White Screening:** T7 and SP6 RNA polymerase promoters flank a multiple cloning region within the α-peptide coding region for β-galactosidase. Insertional inactivation of the α-peptide allows recombinant clones to be identified directly by color screening on indicator plates.
- **f1 Origin of Replication:** Allows preparation of single-stranded DNA.

Storage Conditions: Store competent cells at –70°C; store all other components at –20°C.



Available in the Helix® on-site stocking system

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pTARGET™ Mammalian Expression Vector System

Product	Size	Cat.#
pTARGET™ Mammalian Expression Vector System	20 reactions	A1410
For Research Use Only. Not for Use in Diagnostic Procedures.		

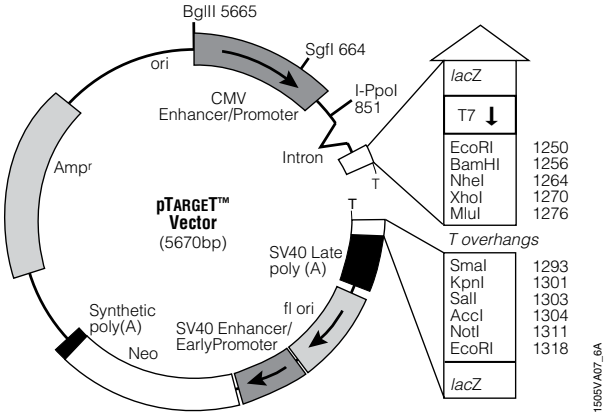
Description: The pTARGET™ Mammalian Expression Vector System is a convenient system for cloning PCR products and expressing cloned PCR products in mammalian cells. The vector is prepared by digestion with EcoRV followed by addition of a 3′ terminal thymidine to each end. These single 3′-T overhangs at the insertion site greatly improve the ligation efficiency of a PCR product into the plasmid in two ways. First, the overhangs prevent recircularization of the vector; second, they provide a compatible overhang for PCR products generated by thermostable polymerases that add a single deoxyadenosine, in a template-independent fashion, to the 3′-ends of amplified fragments. The pTARGET™ Vector also contains a modified coding sequence of the α-peptide of β-galactosidase, which allows recombinants to be selected using blue/white screening.

The pTARGET™ Vector carries the human cytomegalovirus (CMV) immediate-early enhancer/promoter region to promote constitutive expression of cloned DNA inserts in mammalian cells. This vector also contains the neomycin phosphotransferase gene, a selectable marker for mammalian cells. The pTARGET™ Vector can be used for transient expression or stable expression by selecting transfected cells with the antibiotic G-418.

Features:

- **Simple PCR Cloning:** "T" overhangs permit direct ligation of PCR products generated by thermostable enzymes such as *Taq* DNA polymerase.
- **Strong, Constitutive Expression:** The CMV enhancer/promoter region allows strong, constitutive expression in many cell types. In transgenic mice, expression of the chloramphenicol acetyltransferase (CAT) gene under regulation of the CMV enhancer/promoter was observed in 24 of the 28 tissues examined. The vector is maintained as an episome in cells expressing the SV40 large T antigen, leading to even higher levels of expression.
- **Blue/White Screening:** Allows easy identification of recombinant clones. A single digest removes the insert DNA.
- **Stable Transfectants:** Select for stable transfectants using the neomycin phosphotransferase gene.

Storage Conditions: Store competent cells at –70°C; store all other components at –20°C or –70°C.



pTARGET™ Sequencing Primer

Product	Size	Cat.#
pTARGET™ Sequencing Primer	2 µg	Q4461
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The pTARGET™ Sequencing Primer is designed for sequencing inserts cloned into the pTARGET™ Mammalian Expression Vector (Cat.# A1410). The sequencing primer hybridizes to the region of the *lacZ* gene at nucleotides 1367–1344 on the pTARGET™ Vector.

The primer can be used only for sequencing inserts cloned into the pTARGET™ Vector. The primer sequence is not a binding site for any RNA polymerases and cannot be used to generate in vitro transcripts.

The sequence of the pTARGET™ Sequencing Primer is 5′-d(TTACGCCAAGTTATTTAGGTGACA)-3′.

The primer is supplied at a concentration of 10ng/µl (1.25pmol/µl) in sterile water.

Storage Conditions: Store at –20°C.

Sequencing

Products tagged with the Helix® icon are available for distribution through our convenient on-site stocking program in a freezer, refrigerated unit or an ambient cabinet.

For more information visit: **www.promega.com/helix**

Available in the Helix® on-site stocking system

DNA Extraction

Maxwell® HT DNA FFPE Isolation System

Product	Size	Cat.#
Maxwell® HT DNA FFPE Isolation System	4 × 96 preps	A6372
Available Separately	**Size**	**Cat.#**
Buffer A (BWA)	125 ml	A6371
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The Maxwell® HT DNA FFPE Isolation System provides a simple and reliable method for high-throughput, rapid isolation of genomic DNA from FFPE (formalin-fixed, paraffin-embedded) tissue samples. The purified DNA can be used directly in a variety of downstream applications, including PCR and next-generation sequencing.

The Maxwell® HT DNA FFPE Isolation System purifies nucleic acid using paramagnetic particles, which provide a mobile solid phase to optimize sample capture, washing and purification of gDNA. The use of paramagnetic particles for DNA capture eliminates the need for centrifugation or vacuum manifolds, making the system suitable for full automation. In addition, the system does not require an organic solvent, making it safe and convenient.

Features:

- Robust, precipitation-free protocol, no chance of lost pellets
- High yields of pure DNA from FFPE samples without using xylene or other hazardous chemicals
- Ideal for use in downstream applications including qPCR and next-generation sequencing (NGS)

Storage Conditions: Store at room temperature (15–30°C). Do not refrigerate or freeze any of the reagents.

ReliaPrep™ Large Volume HT gDNA Isolation System

Product	Size	Conc.	Cat.#
ReliaPrep™ Large Volume HT gDNA Isolation System	1 each		A2751
HSM 2.0 Instrument	1 each		A2715
Alkaline Protease (APA)	130 ml		A1721
Cell Lysis Buffer (CLD)	1,400 ml		A1731
	160 ml		A1732
Binding Buffer (BBA)	1,600 ml		A1741
	200 ml		A1742
ReliaPrep™ Resin	115 ml		A1752
	5.5 ml		A1753
Prepared Wash Buffer (WBC)	3,500 ml		A2681
Proteinase K (PK) Solution	23 ml		A5051
Nuclease-Free Water	500 ml		P1197
Available Separately	**Size**	**Conc.**	**Cat.#**
RNase A Solution	5 ml	4 mg/ml	A7974
20X TE Buffer (pH 7.5)	25 ml		A2651
Tissue Lysis Buffer (TLA)	500 ml		A5091
Nuclease-Free Water	1,000 ml		P1199
Integrated Reagent Caps	4 /pk		A2701
HSM 2.0 Instrument Cover	1 each		A2712
HSM 2.0 Tube Rack	1 each		A2713
HSM 2.0 Tube Rack Stand	1 each		A2714
HSM 2.0 Instrument 1-Year Service Agreement	1 each		SA1330
ReliaPrep™ LV 32 HSM Standard Service Agreement	1 each		SA3070
Bottle for 50% Ethanol	1 each		A2691
A2751, A7974, A2651, A2715, A1721, A5091, A1731, A1732, P1199, A1741, A1742, A2701, A1752, A1753, A2712, A2681, A2713, A2714, A5051, P1197, SA3070, A2691 For Research Use Only. Not for Use in Diagnostic Procedures.			

Description: The ReliaPrep™ Large Volume HT gDNA Isolation System isolates genomic DNA (gDNA) from 1–10ml of blood in a scalable format. The chemistry eliminates tedious centrifugation steps as well as the use of hazardous chemicals, which are inherent in precipitation-based chemistries. Each reagent kit provides enough reagents to process up to 96 × 10ml whole blood samples. The system has been automated on robotic liquid-handling workstations, allowing walkaway purification of genomic DNA from 1–10ml of whole blood, regardless of sample storage or shipping conditions. For low-throughput isolation of gDNA from up to 32 samples at one time, the HSM 2.0 can be used in a manual mode, where the user performs the pipetting functions. The HSM has software that controls the instrument and directs the user through the purification protocol.

Features:

- **Decrease Hands-On Time:** Automation reduces operator time spent on instrument setup and takedown by allowing walkaway operation for large numbers of samples at one time.
- **Remove Protocol Bottlenecks:** Heater Shaker Magnet eliminates the need to move samples on the robot deck, reducing instrument failures; precipitation-free chemistry dramatically reduces purification failures.
- **Achieve Peace of Mind:** Automated liquid level sensing with operator notification allows recovery of samples in case of error.
- **Isolate Pure DNA from All Samples:** Purification chemistry is equally effective at recovering DNA from pristine as well as challenged (hemolysed or frozen) samples.
- **Save a Day or Two of Processing:** Samples are eluted in buffer, ready for use in downstream assays or archiving, eliminating resuspension of pelleted DNA, which can take 24–48 hours.
- **Reduce Waste:** Chemistry is automatically scaled for each sample and plastic use is conserved, reducing liquid and solid waste during sample runs.

Storage Conditions: Store at 15–30°C.

Maxwell® HT 96 gDNA Blood Isolation System

Product	Size	Conc.	Cat.#
Maxwell® HT 96 gDNA Blood Isolation System	1 × 96 preps		A2670
	4 × 96 preps		A2671
Available Separately	**Size**	**Conc.**	**Cat.#**
Heat Block Adapter	1 each		A2661
RNase A Solution	5 ml	4 mg/ml	A7974
25mM Tris-HCl (pH 8.0)	60 ml		A2641
10mM EDTA (pH 8.0)	10 ml		A2631
20X TE Buffer (pH 7.5)	25 ml		A2651
Wash Buffer (WBA)	500 ml		A1761

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Maxwell® HT 96 gDNA Blood Isolation System provides a simple and reliable method for the rapid isolation of gDNA in a multiwell format. gDNA may be purified from blood and Oragene®•Discover sample collection devices. The purified gDNA can be used directly in PCR assays, microarrays and next-generation sequencing applications. The use of paramagnetic particles for DNA capture eliminates the need for centrifugation or vacuum manifolds, making the system suitable for full automation. In addition, the system does not require an organic solvent, making it safe and convenient. DNA yields of up to 12µg are expected from input blood volumes of 350µl, depending on the WBC count of the sample. Saliva samples can have variable amounts of gDNA, and up to 18µg or more of DNA may be recovered from a 700µl Oragene® collection device sample.

Features:

- **Improve Productivity:** Walkaway automation of genomic DNA extraction.
- **Eliminate Sample Rework:** Robust, precipitation-free protocol, no chance of "lost pellets".
- **Simplify Workflow:** High yields of pure DNA from pristine and challenged or hemolysed samples.
- **Reduce Time to Results:** Pure gDNA ready for demanding applications; samples in solution; no resuspension required.

Storage Conditions: Store at 15–30°C.

ReliaPrep™ gDNA Tissue Miniprep System

Product	Size	Cat.#
ReliaPrep™ gDNA Tissue Miniprep System	100 preps	A2051
	250 preps	A2052

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ReliaPrep™ gDNA Tissue Miniprep System provides a complete, ready-to-use method for purification of gDNA from up to 25mg of tissue, a buccal (cheek) swab, or a 1cm mouse tail snip, obtaining intact gDNA without the use of ethanol washes or precipitations.

Features:

- **Easy to Use:** Reagents are supplied "ready-to-use"; no additions required.
- **Save Time:** Eluted DNA obtained in 30 minutes or less (hands-on time).
- **No Ethanol:** Eliminates alcohol inhibition and carryover.
- **Pure gDNA:** Improved A_{260}/A_{230} ratios vs. the leading competitor.
- **Peace of Mind:** Consistent results from run to run and between users.
- **Concentrated DNA:** Good recovery and purity in as little as 50µl elution.

Storage Conditions: Store at 15–30°C.

MagaZorb® DNA Mini-Prep Kit

Product	Size	Conc.	Cat.#
MagaZorb® DNA Mini-Prep Kit	200 preps		MB1004
	800 preps		MB1008
Available Separately	**Size**	**Conc.**	**Cat.#**
Proteinase K (PK) Solution	16 ml	20 mg/ml	MC5008
20-Position Microcentrifuge Tube Magnetic Separator	1.5 ml		CD4002

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The MagaZorb® DNA Kit provides an easy, fast and cost-effective technique for isolating PCR-quality DNA. Using one simple protocol, a high yield of purified DNA can be isolated from a wide variety of sources including whole blood (fresh or frozen, citrate-, heparin- or EDTA-treated), buffy coat, leukocytes, milk, seminal fluid, dried blood spots, cultured cells, tissue (fresh, frozen or formalin-fixed paraffin-embedded), saliva, urine, stool, hair, buccal swabs and vaginal swabs.

The 20-Position Microcentrifuge Tube Magnetic Separator (Cat.# CD4002) utilizes a microcentrifuge tube rack that can be removed from the high-strength magnets for wash steps or incubation in a water bath. The rack is designed to hold the microcentrifuge tubes so that they will not fall out even when turned upside down, and it can withstand temperatures of up to 80°C for convenient manipulation of sample tubes. Please note that the magnets in the 20-Position Microcentrifuge Tube Magnetic Separator are designed specifically for use with the MagaZorb® DNA Kit; separation may not work with other particles.

Features:

- **Convenient:** Contains all needed reagents so that no reagent preparation is required.
- **Efficient:** Eliminates centrifugation, vacuum filtration or column separation, increasing sample throughput and improving reproducibility.
- **Safe:** Does not require organic solvents, eliminating the need for special storage or waste disposal.

Storage Conditions: Store at 22–25°C.

Available in the Helix® on-site stocking system

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Available in the Helix® on-site stocking system

Wizard® Magnetic 96 DNA Plant System

Product	Size	Cat.#
Wizard® Magnetic 96 DNA Plant System	2 × 96 preps	FF3760
	4 × 96 preps	FF3761
Available Separately		
Wash Buffer, Plant	40 ml	A3811

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Wizard® Magnetic 96 DNA Plant System is designed for manual or automated 96-well, high-throughput purification of DNA from plant leaf and seed tissue. The system has been validated with corn and tomato leaf, as well as with canola and sunflower seeds. The DNA purified from these samples can be used in PCR as well as more demanding applications such as RAPD analysis. Unlike column-based systems, the binding of nucleic acids to magnetic particles can occur in solution, enhancing contact with the wash buffer and increasing nucleic acid purity.

Protocols are available for Beckman Coulter instruments.

Features:

- **Improved Productivity:** Manual and automated 96-well protocols cut purification time compared to CTAB extraction.
- **Ease of Handling:** Eliminates organic extractions, multiple centrifugations and cumbersome filter plates.
- **Confidence in Applications Performance:** Validated for both leaf and seed tissue by PCR and RAPD analysis.
- **Automation:** Validated automated methods available at: **www.promega.com/automethods/**
- **Your Choice of Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at 22–25°C.

Wizard® Magnetic DNA Purification System for Food

Product	Size	Cat.#
Wizard® Magnetic DNA Purification System for Food	200 preps	FF3750
	400 preps	FF3751
Available Separately		
Lysis Buffer A, Food	100 ml	A8191
Lysis Buffer B, Food	100 ml	Z3191
Precipitation Solution, Food	150 ml	Z3201

A8191, Z3191, Z3201 For Research Use Only. Not for Use in Diagnostic Procedures. FF3750, FF3751 For in vitro use only.

Description: The Wizard® Magnetic DNA Purification System for Food is designed for purification of DNA from a variety of food samples including corn seeds, cornmeal, soybeans, soy flour and soy milk. Processed food, such as corn chips, chocolate and chocolate-containing foods, lecithin and vegetable oils may also be used with the suggested protocol variations. The DNA purified from these samples can be used in PCR-based testing for genetically modified organism (GMO) DNA sequences.

Features:

- **Improved Productivity:** Obtain results in one-third the time of current methods.
- **Ease of Handling:** Requires minimal centrifugation and eliminates organic extractions.
- **Versatility and Robustness:** Validated with a broad variety of foodstuffs, including difficult samples such as lecithin and vegetable oils.

Storage Conditions: Store at 22–25°C.

Maxwell® RSC System DNA Purification Kits

Product	Size	Cat.#
Maxwell® RSC Blood DNA Kit	48 preps	AS1400
Maxwell® RSC Whole Blood DNA Kit	48 preps	AS1520
Maxwell® RSC DNA FFPE Kit	48 preps	AS1450
Maxwell® RSC FFPE Plus DNA Kit	48 preps	AS1720
Maxwell® RSC Cell DNA Purification Kit	48 preps	AS1370
Maxwell® RSC ccfDNA Plasma Kit	48 preps	AS1480
Maxwell® RSC Buccal Swab DNA Kit	48 preps	AS1640
Maxwell® RSC Stabilized Saliva DNA Kit	48 preps	AS1630
Maxwell® RSC Tissue DNA Kit	48 preps	AS1610
Maxwell® RSC Cultured Cells DNA Kit	48 preps	AS1620
Maxwell® RSC Buffy Coat DNA Kit	48 preps	AS1540
Maxwell® RSC Plant DNA Kit	48 preps	AS1490
Maxwell® RSC PureFood GMO and Authentication Kit	48 preps	AS1600
Maxwell® RSC PureFood Pathogen Kit	48 preps	AS1660
Available Separately		
Maxwell® RSC Instrument	1 each	AS4500
RSC/CSC Deck Tray	1 each	SP6019
Maxwell® Instrument Bar Code Reader	1 each	AS3200
Microtubes, 1.5ml	1,000 /bag	V1231
ClickFit Microtube, 1.5ml	1,000 /pack	V4741
CTAB Buffer	100 ml	MC1411

AS1600, AS1660, MC1411 Not For Medical Diagnostic Use. All others For Research Use Only. Not for Use in Diagnostic Procedures.

Description: These kits can be used for automated DNA purification with the Maxwell® RSC Instrument:

Maxwell® RSC Blood DNA Kit

- Extracts DNA from whole blood or buffy coat samples in 30–40 minutes.
- Processes up to 400µl of whole blood.
- Yields up to 15µg of gDNA, depending on white blood cell count.

Maxwell® RSC Whole Blood DNA Kit

- Extracts DNA from 50–500µl of whole blood in less than 40 minutes.
- Simple, walkaway protocol with no preprocessing.
- Compatible with blood stored in EDTA, heparin and citrate anticoagulants.

Maxwell® RSC DNA FFPE Kit

- Extracts amplifiable DNA from FFPE tissue sections.
- Eliminates the use of hazardous organic solvents.
- Purified DNA performs better in downstream applications.

Maxwell® RSC FFPE Plus DNA Kit

- Purifies DNA from 1–48 (5µm) FFPE samples
- Faster digestion option without organic solvents
- Sufficient yield for downstream amplification

Maxwell® RSC Cell DNA Purification Kit

- Extracts DNA from samples containing less than 10,000 cells.
- Compatible with low-cell-number samples such as amniotic fluid, cerebral spinal fluid and cell supernatants.
- Cells are collected and processed in up to 400µl volumes, and extraction is complete in about 30 minutes.

Maxwell® RSC ccfDNA Plasma Kit

- Simple, walkaway protocol with no preprocessing.
- Provides high yields of pure and amplifiable ccfDNA.
- Scalable protocol, process ccfDNA from 0.2–1ml of plasma.

Maxwell® RSC Buccal Swab DNA Kit

- Optimized reagents for buccal swab extraction.
- Decreased hands-on time with simple protocol.
- Consistent results with sufficient DNA for HLA assays.

Maxwell® RSC Stabilized Saliva DNA Kit

- Simple protocol with optimized reagents.
- Consistent DNA yields.
- DNA ready to use in downstream assays such as HLA typing.

Maxwell® RSC Tissue DNA Kit

- Extracts DNA from up to 50mg of mammalian tissue.
- Purifies high yields of amplifiable DNA.
- Automated protocol improves efficiency.

Maxwell® RSC Cultured Cells DNA Kit

- Extracts DNA from up to 5×10^6 mammalian tissue culture cells and 2×10^9 bacterial cells.
- Simple, walkaway protocol requires no sample preprocessing.
- Purified DNA is ready for analysis in about 45 minutes.

Maxwell® RSC Buffy Coat DNA Kit

- Purifies high yields of DNA from 50–250µl of buffy coat samples in about 50 minutes.
- Simple walkaway protocol with no preprocessing.
- Compatible with blood stored in EDTA, heparin and citrate anticoagulants.

Maxwell® RSC Plant DNA Kit

- Extracts DNA from a range of plant tissues, including soybean, corn and *Arabidopsis*.
- Consistent purification, no organic extractions and minimal preprocessing.
- Purified DNA is ready to use in downstream applications including amplification assays.

Maxwell® RSC PureFood GMO and Authentication Kit

- Purifies high-quality DNA from a range of food and feed samples.
- Results in highly concentrated DNA that is ready to use in downstream assays.
- Simple, five-step protocol saves time and eliminates organic extraction steps.

Maxwell® RSC PureFood Pathogen Kit

- Isolate DNA from raw or processed food samples
- Works well with inhibiting sample types
- No need for labor-intensive sample processing

Available in the Helix® on-site stocking system

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ReliaPrep™ FFPE gDNA Miniprep System

Product	Size	Cat.#
ReliaPrep™ FFPE gDNA Miniprep System	10 reactions	A2351
	100 reactions	A2352
Available Separately		
Microtubes, 1.5ml	1,000 /bag	V1231
ClickFit Microtube, 1.5ml	1,000 /pack	V4741

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ReliaPrep™ FFPE gDNA Miniprep System provides a complete, all-inclusive method for purifying quality genomic DNA from formalin-fixed paraffin-embedded tissue without using hazardous solvents or overnight digestion. Genomic DNA can be isolated from FFPE tissue in approximately two and one-half hours with minimal hands-on time.

Features:

- **Isolate Quality, Intact gDNA:** Optimized lysis and binding conditions reverse modifications introduced by the fixation process, resulting in intact, amplifiable gDNA.
- **Safely Deparaffinize Your Sample:** Deparaffinization step occurs without harsh organic solvents.
- **Save Time:** Purify gDNA from FFPE tissue in less than two and one-half hours with minimal hands-on time. No overnight digestion required.
- **Easy to Use:** Minimal preparation time; simply add ethanol and go!

Storage Conditions: Store at room temperature.

ReadyAmp™ Genomic DNA Purification System

Product	Size	Cat.#
ReadyAmp™ Genomic DNA Purification System	100 reactions	A7710

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ReadyAmp™ Genomic DNA Purification System yields single-stranded DNA (ssDNA) from whole blood or blood stains that may be used directly in amplification reactions without further manipulation. The process takes less than one hour and requires no organic extractions or ethanol precipitations.

Features:

- **Simple and Effective:** ReadyAmp™ resin removes PCR inhibitors.
- **Convenient:** Isolated DNA can be used directly in PCR amplifications.

Storage Conditions: Store at 22–25°C.

ReliaPrep™ Blood gDNA Miniprep System

Product	Size	Cat.#
ReliaPrep™ Blood gDNA Miniprep System	100 preps	A5081
	250 preps	A5082

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ReliaPrep™ Blood gDNA Miniprep System provides a complete, ready-to-use method for purification of gDNA from up to 200µl of blood or body fluid, consistently isolating pure, intact gDNA without the use of alcohol washes or precipitations. Genomic DNA can be prepared from fresh or frozen blood in less than 40 minutes with expected DNA yields of 4–10µg, depending on the white blood cell count of the blood sample.

Features:

- **Easy to Use:** Reagents are supplied "ready to go"; no additions required.
- **Save Time:** Eluted DNA obtained in 30 minutes or less.
- **No Ethanol:** Eliminates alcohol inhibition and carryover.
- **Pure gDNA:** Improved A_{260}/A_{230} ratios vs. the leading competitor.
- **Peace of Mind:** Consistent results from run to run and between users even with hemolyzed samples.
- **Concentrated DNA:** Good recovery and purity in as little as 50µl elution.

Storage Conditions: Store at 15–30°C.

Wizard® SV 96 Genomic DNA Purification System

Product	Size	Conc.	Cat.#
Wizard® SV 96 Genomic DNA Purification System	1 × 96 preps		A2370
	4 × 96 preps		A2371
Available Separately	**Size**	**Conc.**	**Cat.#**
Wizard® SV Lysis Buffer	50 ml		Z3052
Column Wash Solution (CWA)	185 ml		A1311
Nuclei Lysis Solution	50 ml		A7941
EDTA, 0.5M (pH 8.0), Molecular Biology Grade	100 ml		V4231
RNase A Solution	1 ml	4 mg/ml	A7973
Wizard® SV 96 Binding Plates	10 pack		A2271

A2370, Z3052, A2371, A6780, A7941, A6782, V4231, A6784, A7973, A2271 For Research Use Only. Not for Use in Diagnostic Procedures. A1311 For Laboratory Use.

Description: The Wizard® SV 96 Genomic DNA Purification System provides a high-throughput, membrane-based technique for consistent preparation of genomic DNA from cultured cells and tissue, including mouse tails. Amplifiable genomic DNA can be isolated from up to 5×10^6 cells, 20mg of tissue or up to 1.2cm of a mouse tail tip without a centrifugation clearing step.

With the Wizard® SV Genomic DNA purification system, genomic DNA is purified from cell lysates using 96-well vacuum filtration. Washing the bound DNA requires no disassembly of the manifold, and filtrate waste products are delivered directly to a vacuum trap, eliminating the need to empty waste collection trays.

The Wizard® SV Genomic DNA Purification System is designed for use either in a manual format or with Beckman Coulter or PerkinElmer automated instruments.

Features:

- **Improve Productivity:** Obtain genomic DNA from mouse tails in 45–60 minutes, genomic DNA from cultured cells in 30 minutes. No spins required.
- **Achieve High Yield:** Purify 20–30µg of DNA per prep from 1.2cm of mouse tail.
- **Gain Confidence in Applications:** Purified DNA ready for amplification.
- **Automate This Assay:** Validated automated methods available at: **www.promega.com/automethods/**
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at 22–25°C.

Wizard® SV Genomic DNA Purification System

Product	Size	Conc.	Cat.#
Wizard® SV Genomic DNA Purification System	50 preps		A2360
	250 preps		A2361
Available Separately	**Size**	**Conc.**	**Cat.#**
Wizard® SV Lysis Buffer	50 ml		Z3052
Column Wash Solution (CWA)	185 ml		A1311
Nuclei Lysis Solution	50 ml		A7941
EDTA, 0.5M (pH 8.0), Molecular Biology Grade	100 ml		V4231
RNase A Solution	1 ml	4 mg/ml	A7973
Microtubes, 1.5ml	1,000 /bag		V1231
ClickFit Microtube, 1.5ml	1,000 /pack		V4741

A2360, Z3052, A2361, A6770, A7941, A6772, V4231, A6774, A7973, V1231, V4741 For Research Use Only. Not for Use in Diagnostic Procedures. A1311 For Laboratory Use.

Description: The Wizard® SV Genomic DNA Purification System provides a fast, simple, membrane-based technique for preparing genomic DNA from cultured cells and tissue, including mouse tails. Genomic DNA can be purified from cultured cells in about 20 minutes. Isolation from tissue or mouse tails requires an overnight digestion with Proteinase K (Cat.# V3021). Amplifiable genomic DNA can be isolated from up to 5×10^6 cells, 20mg of tissue or up to 1.2cm of a mouse tail tip without a centrifugation clearing step.

The Wizard® SV Genomic DNA Purification System can be used in either a microcentrifuge (spin) or vacuum protocol. Up to 20 samples can be processed at once in the vacuum format with the Vac-Man® Laboratory Vacuum Manifold (Cat.# A7231) and the Vacuum Adapters (Cat.# A1331).

Features:

- **Improved Productivity:** Obtain genomic DNA approximately 20 minutes after lysis.
- **High Yield:** Purify 20–30µg of DNA per prep from 1.2cm mouse tail.
- **Format Choice:** Perform purification by either spin or vacuum formats.

Storage Conditions: Store at 22–25°C.

Available in the Helix® on-site stocking system
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Quantification for NGS

ProNex® NGS Library Quant Kit

Product	Size	Cat.#
ProNex® NGS Library Quant Kit	500 reactions	NG1201
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The ProNex® NGS Library Quant Kit contains reagents to determine the concentration of next-generation-sequencing libraries compatible with Illumina platforms using qPCR. Data generated using the ProNex® NGS Library Quant Kit can be used to normalize the DNA concentration for sequencing libraries to the desired concentration prior to multiplex pooling of samples. This is the most consistent NGS library quantitation kit you can get.

Features:

- Measure intact, functional library concentration
- BRYT Green® dye-based qPCR system for maximum reproducibility
- Ideal for multiplexed pooling of Illumina libraries

Storage Conditions: Store at –30°C to –10°C in a nonfrost-free freezer protected from light.

ProNex® DNA QC Assay

Product	Size	Cat.#
ProNex® DNA QC Assay BioRad CFX96™	200 reactions	NG1004
ProNex® DNA QC Assay BioRad CFX96™	800 reactions	NG1005
ProNex® DNA QC Assay ABI 7500/7500FAST	200 reactions	NG1002
ProNex® DNA QC Assay ABI 7500/7500FAST	800 reactions	NG1003
ProNex® DNA QC Assay Calibration Kit	1 each	NG1001
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The ProNex® DNA QC Assay evaluates the quality and quantity of genomic DNA extracted from formalin-fixed paraffin-embedded (FFPE) samples or other potentially degraded DNA sources. It is a human-specific, multiplexed, probe-based quantitative polymerase chain reaction (qPCR) assay that may also be used to evaluate the ratio of circulating cell-free DNA (ccfDNA) to higher molecular weight genomic DNA in plasma samples. The multiplex assay detects 75bp, 150bp and 300bp human genomic DNA sequences, and it includes an internal positive control (IPC) to test for false-negative results that may occur in the presence of PCR inhibitors.

Features:

- **Integrated Instrumentation and Assay:** The QuantiFluor® dyes are optimized for high sensitivity, broad dynamic range and target specificity on the Quantus™ Fluorometer.
- Human-specific, multiplexed, probe-based qPCR assay with internal positive control.
- Detect 75bp, 150bp and 300bp human genomic DNA sequences.
- Evaluate your samples for amplifiability and predict downstream assay success.

Storage Conditions: Store at –30°C to –10°C.

Quantus™ NGS Starter Package

Product	Size	Cat.#
Quantus™ NGS Starter Package	1 each	E5150
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The Quantus™ NGS Starter Package provides highly sensitive, easy-to-use DNA quantitation for NGS applications, all in one discounted bundle. Contents include a Quantus™ Fluorometer (Cat.# E6150); QuantiFluor® ONE dsDNA System (Cat.# E4870) and enough 0.5ml assay tubes for 500 reactions.

The Quantus™ Fluorometer is a compact and easy-to-operate instrument designed for sensitive fluorescence detection of nucleic acids. The fluorometer is optimized with preprogrammed settings for Promega QuantiFluor® Dye Systems (QuantiFluor® dsDNA, RNA, ssDNA Systems) for nucleic acid quantitation and allows you the flexibility to create your own methods and quantitation settings for other dyes.

The QuantiFluor® ONE dsDNA System provides a fluorescent double-stranded DNA-binding dye in an "add-and-read" format for both dye and standard, simplifying DNA quantitation and speeding up your workflow. It's as easy to use as NanoDrop® absorbance-based methods but much more sensitive for low-concentration samples.

Features:

- **Integrated Instrumentation and Assay:** The QuantiFluor® dyes are optimized for high sensitivity, broad dynamic range and target specificity on the Quantus™ Fluorometer.
- **Easy to Use:** Add-and-read format makes measuring low concentrations of dsDNA simple—no dilutions, no extra tubes.
- **Increased Sensitivity:** Significantly increased sensitivity over absorbance at 260nm (NanoDrop spectrophotometer) for those samples that are low in concentration.
- **High Specificity to dsDNA:** Minimal binding to ssDNA, RNA, protein and interfering compounds.
- **Cost Effective:** Easily incorporate into your laboratory.
- **Used for Next-Gen Sequencing:** Successfully used in several NGS systems including Illumina (HiSeq/miSeq), Roche (454) and LifeTech (ion Torrent and ion Proton) systems.

Storage Conditions: Store QuantiFluor® ONE dsDNA Dye and QuantiFluor® ONE Lambda DNA at –30°C to +10°C. Store 1X TE Buffer at –30°C to +30°C.

QuantiFluor® ONE dsDNA System

Product	Size	Cat.#
QuantiFluor® ONE dsDNA System	100 reactions	E4871
	500 reactions	E4870
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 160.

QuantiFluor® dsDNA System

Product	Size	Cat.#
QuantiFluor® dsDNA System	1 ml	E2670
QuantiFluor® dsDNA Sample Kit	1 each	E2671
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 160.

QuantiFluor® ssDNA System

Product	Size	Cat.#
QuantiFluor® ssDNA System	1 ml	E3190
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 161.

QuantiFluor® RNA System

Product	Size	Cat.#
QuantiFluor® RNA System	1 ml	E3310
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 161.

Quantus™ Fluorometer

Product	Size	Cat.#
Quantus™ Fluorometer	1 each	E6150
E6150 For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 297.

Available in the Helix® on-site stocking system

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Library Preparation for NGS

ProNex® Size-Selective Purification System

Product	Size	Cat.#
ProNex® Size-Selective Purification System	10ml	NG2001
	125ml	NG2002
	500ml	NG2003
Available Separately	**Size**	**Cat.#**
Wash Buffer	340ml	NG1051
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The ProNex® Size-Selective Purification System enables the rapid and efficient magnetic resin-based purification of double-stranded DNA (dsDNA) for next-generation sequencing (NGS), polymerase chain reaction (PCR) and general molecular biology applications. The ProNex® System allows users to select the desired size of purified dsDNA fragments, from 100bp to 750bp. The novel reagent formulation provides significantly improved selectivity, reproducibility and yield relative to traditional dsDNA purification methods. In addition, the ProNex® System can be used in both manual and automated high-throughput workflows.

Features:

- High specificity of size selection with low carryover of unwanted DNA
- Exceptional DNA recovery
- Fast magnetic response time and low viscosity for accurate pipetting

Storage Conditions: Upon receipt, remove the ProNex® Chemistry bottle(s) from the kit package and store at 2–10°C. Do not freeze. Do not allow ProNex® Chemistry to dry during storage. Store the remaining kit components at 15–30°C.

Wizard® SV Gel and PCR Clean-Up System

Product	Size	Cat.#
Wizard® SV Gel and PCR Clean-Up System	50 preps	A9281
	250 preps	A9282
	1,000 preps	A9285
Wizard® SV Gel and PCR Clean-Up System and x-tracta™ Gel Extractor Bundle	50 preps/25 extractors	A9283
	250 preps/100 extractors	A9284
Available Separately		
Membrane Binding Solution	20 ml	A9301
Vacuum Adapters	20 each	A1331
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The Wizard® SV Gel and PCR Clean-Up System is designed to extract and purify DNA fragments of 100bp to 10kb from standard or low-melting agarose gels or to purify products directly from PCR and other common reactions such as restriction digests. Up to 95% recovery is achieved depending upon the DNA fragment size. PCR products are commonly purified to remove excess nucleotides and primers. This membrane-based system, which can bind up to 40µg of DNA, allows recovery of isolated DNA fragments or PCR products in as little as 15 minutes, depending on the number of samples processed. The purified DNA can be used for automated fluorescent DNA sequencing, cloning, labeling, restriction enzyme digestion or in vitro transcription/translation without further manipulation.

Features:

- **Improved Productivity:** Purify DNA fragments or PCR products in as little as 15 minutes.
- **Enhanced Cloning Results:** Up to 95% recovery eluted in as little as 15µl.
- **Confidence in Results:** Purified DNA routinely achieves 700 bases with >98% accuracy in automated fluorescent sequencing.
- **Applications Tested:** DNA is suitable for automated fluorescent sequencing, cloning, labeling, restriction enzyme digestion or in vitro transcription/translation without further manipulation.
- **One System to Do It All:** One system can replace up to four kits from other suppliers.

Storage Conditions: Store at 22–25°C.

RNasin® Ribonuclease Inhibitors

Product	Size	Conc.	Cat.#
RNasin® Ribonuclease Inhibitor	2,500 u	20–40 u/µl	N2111
	10,000 u	20–40 u/µl	N2115
Recombinant RNasin® Ribonuclease Inhibitor	2,500 u	20–40 u/µl	N2511
	10,000 u	20–40 u/µl	N2515
RNasin® Plus RNase Inhibitor	2,500 u	40 u/µl	N2611
	10,000 u	40 u/µl	N2615

N2111, N2115 For Research Use Only. Not for Use in Diagnostic Procedures.
N2511, N2515, N2611, N2615 For Laboratory Use.

For additional information see page 122.

Genomic DNA

Product	Size	Cat.#
Human Genomic DNA: Male	100 µg	G1471
Human Genomic DNA: Female	100 µg	G1521
Human Genomic DNA	100 µg	G3041
Mouse Genomic DNA	100 µg	G3091

G1471, G1521, G3041 For Laboratory Use. G3091 For Research Use Only. Not for Use in Diagnostic Procedures.

For additional information see page 281.

Confirmatory Testing for NGS

GoTaq® Real-Time qPCR and RT-qPCR Systems for Probe-Based Detection

Product	Size	Cat.#
GoTaq® Probe qPCR Master Mix	2 ml	A6101
	10 ml	A6102
GoTaq® Probe 2-Step RT-qPCR System	2 ml	A6110
GoTaq® Probe 1-Step RT-qPCR System	2 ml	A6120
	12.5 ml	A6121

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The **GoTaq® Probe qPCR Master Mix** is optimized for quantitative PCR assays in the hydrolysis probe detection format. It is provided as a ready-to-use, stabilized 2X formulation that includes all components for qPCR (except template, primers and probe). This master mix does not contain a reference dye; however, a separate tube of carboxy-X-rhodamine (CXR) reference dye is included with this system, allowing users to add reference dye to amplification reactions if desired.

The GoTaq® Probe qPCR Master Mix provides resistance to a wide range of PCR inhibitors. This formulation uses antibody-mediated hot-start chemistry, allowing reaction setup to be performed at room temperature. The master mix also employs rapid hot-start activation and processive enzymes, making it compatible with both standard and fast instrument cycling programs.

The **GoTaq® Probe 2-Step RT-qPCR System** is optimized for quantitative PCR assays in the hydrolysis probe detection format. The system protocol facilitates detection and relative quantification of RNA expression levels via a two-step RT-qPCR method using integrated components:

- GoScript™ Reverse Transcription System
- GoTaq® Probe qPCR Master Mix

The GoScript™ Reverse Transcription System includes an optimized reaction buffer and reverse transcriptase that enable efficient synthesis of first-strand cDNA in preparation for PCR amplification. The cDNA product may be added directly to downstream qPCR amplification reactions.

The **GoTaq® Probe 1-Step RT-qPCR System** is optimized for quantitative PCR assays in the hydrolysis probe detection format. The system enables detection and relative quantification of RNA expression levels using a one-step RT-qPCR method, combining GoScript™ Reverse Transcriptase and GoTaq® Probe qPCR Master Mix in single-step real-time amplification reactions.

The GoScript™ RT Mix for 1-Step RT-qPCR (50X) combines optimized amounts of GoScript™ Reverse Transcriptase, RNasin® Plus RNase Inhibitor, dUTP and additives to enhance single-step reactions.

Features:

- **Superior Performance:** Sensitive detection on any real-time instrument.
- **Enhanced Stability:** Exceptional room-temperature setup makes it suitable for automation and high-throughput detection.
- **Versatility:** Compatible with both fast and standard cycling methods.
- **Confidence:** The Promega PCR Performance Guarantee.

Storage Conditions: Store all components between –30°C and –10°C. Protect components from light at all times. For best results, mix thawed solutions gently to minimize aeration and foaming, and keep on ice. For short-term storage and frequent use, the GoTaq® qPCR Master Mix, 2X, may be kept at 2–8°C for up to 3 months if protected from light.

Available in the Helix® on-site stocking system

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GoTaq® Real-Time qPCR and RT-qPCR Systems for Dye-Based Detection

Product	Size	Cat.#
GoTaq® qPCR Master Mix	5 ml	A6001
	25 ml	A6002
GoTaq® 2-Step RT-qPCR System	5 ml	A6010
GoTaq® 1-Step RT-qPCR System	5 ml	A6020
Available Separately		
CXR Reference Dye	100 µl	C5411

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The **GoTaq® qPCR Master Mix** is a ready-to-use 2X master mix for use in real-time quantitative PCR (qPCR and RT-qPCR). The system contains BRYT Green® dye, a novel fluorescent DNA-binding dye with minimal PCR inhibition for maximum PCR efficiency and greater fluorescence enhancement upon binding to double-stranded DNA (dsDNA) than SYBR® Green I. Containing the GoTaq® Hot Start Polymerase, optimized buffer and proprietary dye, the GoTaq® qPCR Master Mix provides robust real-time PCR with earlier quantification cycle values and broad range detection for increased reliability, reproducibility and sensitivity.

The **GoTaq® 2-Step RT-qPCR System** is a reagent system for quantitative analysis of RNA using a two-step reverse transcription-quantitative PCR (RT-qPCR) protocol. The components and protocol allow robust, reliable cDNA synthesis of a full range of rare and abundant transcripts, even in the presence of inhibitors, using the GoScript™ Reverse Transcription System and quantification using the GoTaq® qPCR Master Mix.

The **GoTaq® 1-Step RT-qPCR System** is a reagent system for quantitative analysis of RNA using a one-step reverse transcription-quantitative PCR (RT-qPCR) protocol in a single tube. The BRYT Green® Fluorescent Dye and optimized buffer formulations improve data accuracy and sensitivity of low-level targets.

Features:

- **Brighter Signal:** Sensitive detection for earlier quantitation of low- and high-copy-number targets.
- **Enhanced Stability:** Exceptional room-temperature setup makes it suitable for automation and high-throughput detection.
- **Versatility:** Compatible with both fast and standard qPCR cycling methods.
- **Robustness:** High-efficiency, full-length cDNA synthesis in the presence of inhibitors.
- **Confidence:** The Promega PCR Performance Guarantee.

Storage Conditions: Upon arrival, store all components at –30 to –10°C, protected from light. For immediate use, components may be stored at 2–8°C, protected from light, for up to 3 months.

Vectors

Products tagged with the Helix® icon are available for distribution through our convenient on-site stocking program in a freezer, refrigerated unit or an ambient cabinet.

For more information visit: **www.promega.com/helix**

Available in the Helix® on-site stocking system

Cloning, Subcloning and Transcription Vectors

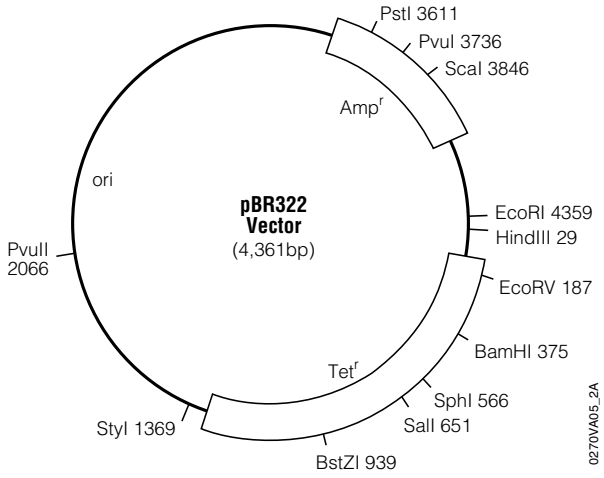
pBR322 Vector

Product	Size	Conc.	Cat.#
pBR322 Vector	10 µg	1 µg/µl	D1511

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The plasmid pBR322 Vector (4,361bp) carries the genes for tetracycline and ampicillin resistance. pBR322 DNA digests typically are used as molecular weight size markers in gel analysis of nucleic acids.

Storage Conditions: Store at –20°C.



pGEM®-3Z Vector

Product	Size	Cat.#
pGEM®-3Z Vector	20 µg	P2151

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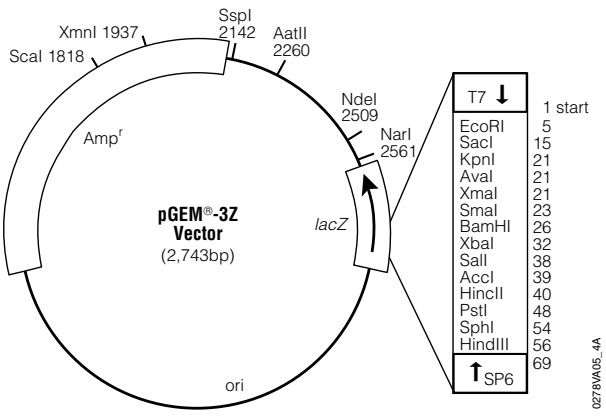
For additional information see page 127.



pGEM®-3Zf(+/–) Vectors

Product	Size	Cat.#
pGEM®-3Zf(+) Vector	20 µg	P2271
pGEM®-3Zf(–) Vector	20 µg	P2261

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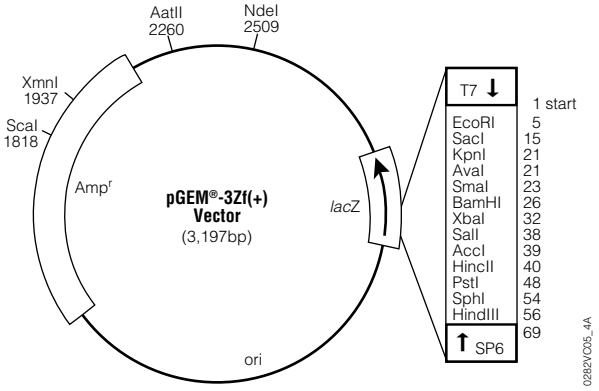
For additional information see page 127.



pGEM®-4Z Vector

Product	Size	Cat.#
pGEM®-4Z Vector	20 µg	P2161

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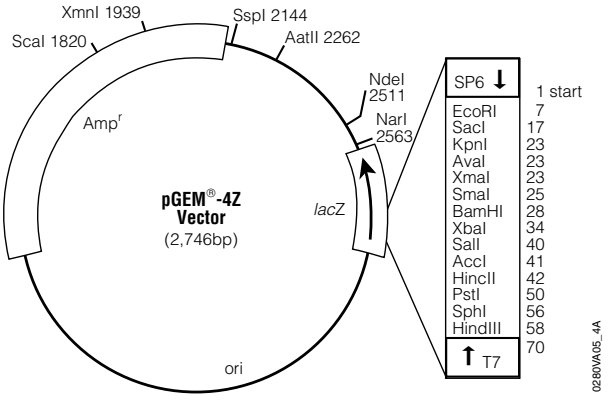
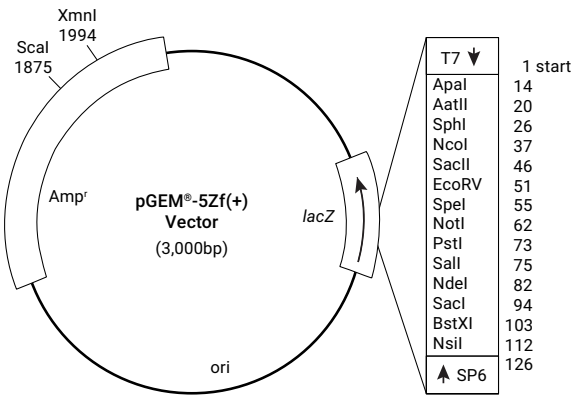
For additional information see page 128.



pGEM®-5Zf(+) Vector

Product	Size	Cat.#
pGEM®-5Zf(+) Vector	20 µg	P2241
For Research Use Only. Not for Use in Diagnostic Procedures.		

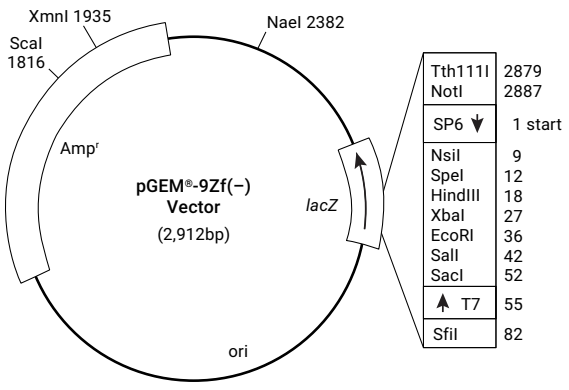
For additional information see page 128.



pGEM®-9Zf(–) Vector

Product	Size	Cat.#
pGEM®-9Zf(–) Vector	20 µg	P2391
For Research Use Only. Not for Use in Diagnostic Procedures.		

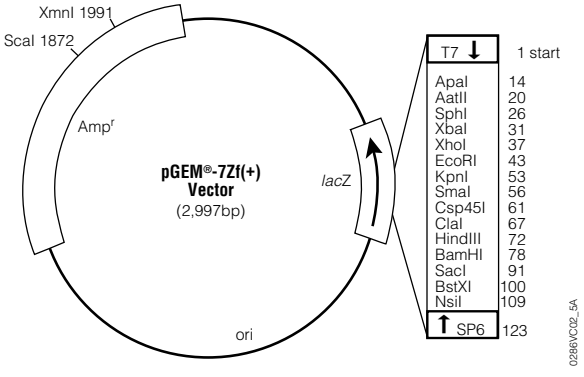
For additional information see page 129.



pGEM®-7Zf(+\–) Vectors

Product	Size	Cat.#
pGEM®-7Zf(+) Vector	20 µg	P2251
pGEM®-7Zf(–) Vector	20 µg	P2371
For Research Use Only. Not for Use in Diagnostic Procedures.		

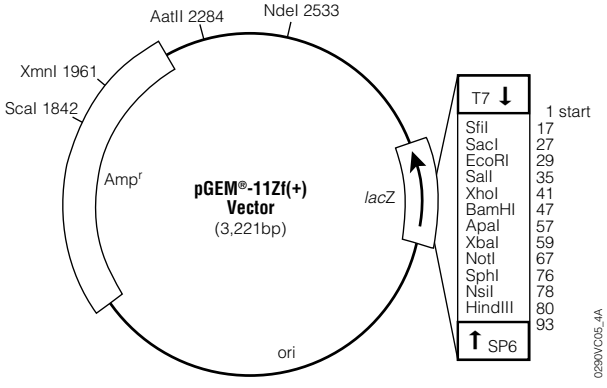
For additional information see page 129.



pGEM®-11Zf(+) Vector

Product	Size	Cat.#
pGEM®-11Zf(+) Vector	20 µg	P2411
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 130.



Available in the Helix® on-site stocking system

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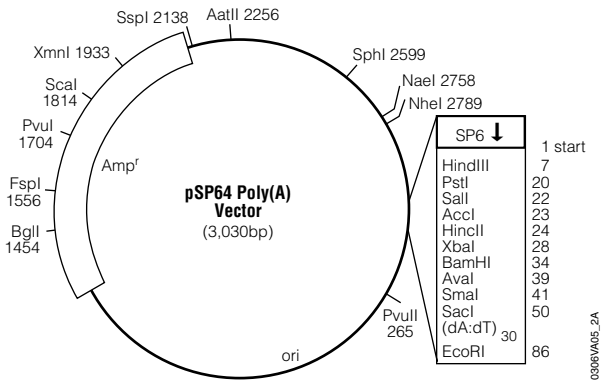
pSP64 Poly(A) Vector

Product	Size	Cat.#
pSP64 Poly(A) Vector	20 µg	P1241
For Research Use Only. Not for Use in Diagnostic Procedures.		

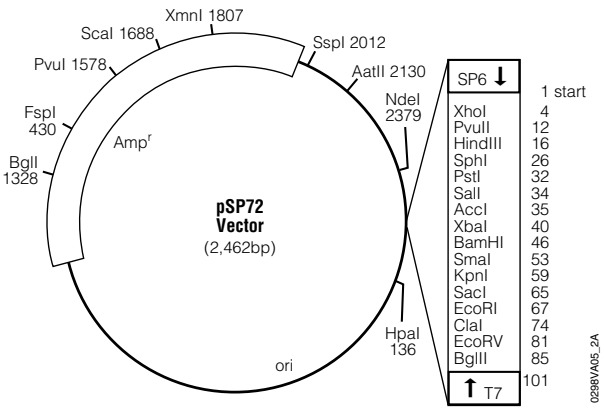
For additional information see page 130.



pSP72 Vector

Product	Size	Cat.#
pSP72 Vector	20 µg	P2191
For Research Use Only. Not for Use in Diagnostic Procedures.		

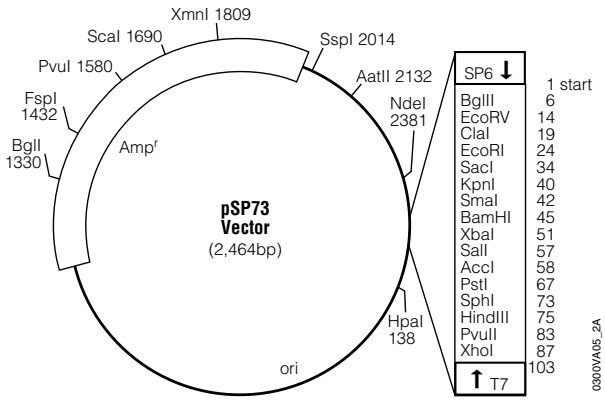
For additional information see page 131.



pSP73 Vector

Product	Size	Cat.#
pSP73 Vector	20 µg	P2221
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 131.



pUC/M13 Sequencing Primers

Product	Size	Conc.	Cat.#
pUC/M13 Primer, Reverse (17mer)	2 µg	10 µg/ml	Q5401
pUC/M13 Primer, Forward (24mer)	2 µg	10 µg/ml	Q5601
For Research Use Only. Not for Use in Diagnostic Procedures.			

Description: The pUC/M13 Primers are designed for sequencing inserts cloned into the M13 vectors and pUC plasmids developed by Messing. These primers also can be used for sequencing other *lacZ*-containing plasmids such as the pGEM®-Z and pGEM®-Zf Vectors. The primers are purified by gel electrophoresis or HPLC.

Primer Sequences

- Reverse (17mer): 5´-d(CAGGAAACAGCTATGAC)-3´
- Forward (24mer): 5´-d(CGCCAGGGTTTTCCCAGTCACGAC)-3´

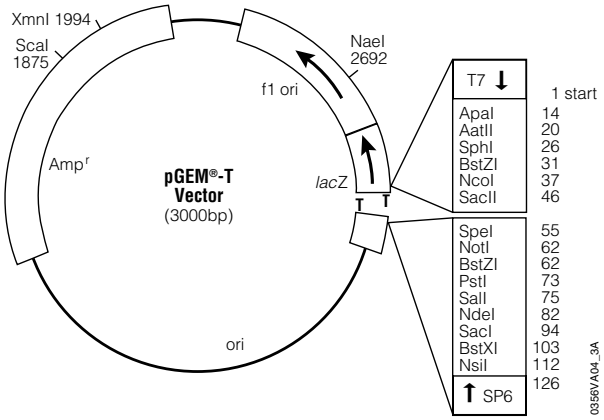
Storage Conditions: Store at –20°C. The primers are supplied in sterile water.

pGEM®-T Vector Systems

Product	Size	Cat.#
pGEM®-T Vector System I	20 reactions	A3600
pGEM®-T Vector System II	20 reactions	A3610

For Research Use Only. Not for Use in Diagnostic Procedures.

For additional information see page 197.

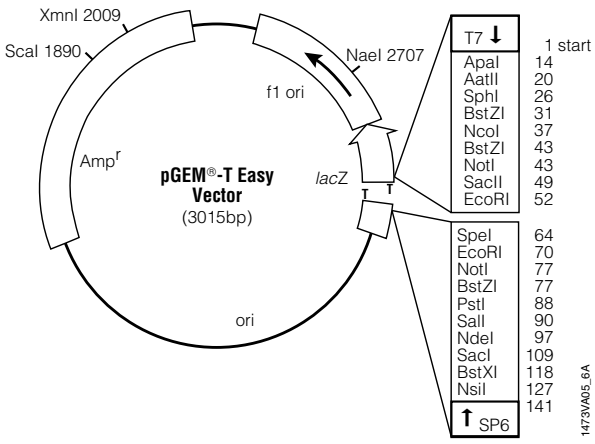


pGEM®-T Easy Vector Systems

Product	Size	Cat.#
pGEM®-T Easy Vector System I	20 reactions	A1360
pGEM®-T Easy Vector System II	20 reactions	A1380

For Research Use Only. Not for Use in Diagnostic Procedures.

For additional information see page 197.



Available in the Helix® on-site stocking system

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Protein Expression Vectors

HaloTag® Vectors for *E. coli* and Cell-Free Protein Expression

Product	Size	Cat.#
pH6HTN His_6HaloTag® T7 Vector	20 µg	G7971
pH6HTC His_6HaloTag® T7 Vector	20 µg	G8031
pF1A T7 Flexi® Vector	20 µg	C8441
pF1K T7 Flexi® Vector	20 µg	C8451
pFN18A HaloTag® T7 Flexi® Vector	20 µg	G2751
pFN18K HaloTag® T7 Flexi® Vector	20 µg	G2681
pFN19A HaloTag® T7 SP6 Flexi® Vector	20 µg	G1891
pFN19K HaloTag® T7 SP6 Flexi® Vector	20 µg	G1841
pFC20A HaloTag® T7 SP6 Flexi® Vector	20 µg	G1681
pFC20K HaloTag® T7 SP6 Flexi® Vector	20 µg	G1691
pFN29A His_6HaloTag® T7 Flexi® Vector	20 µg	G8261
pFN29K His_6HaloTag® T7 Flexi® Vector	20 µg	G8331
pFC30A His_6HaloTag® T7 Flexi® Vector	20 µg	G8321
pFC30K His_6HaloTag® T7 Flexi® Vector	20 µg	G8381

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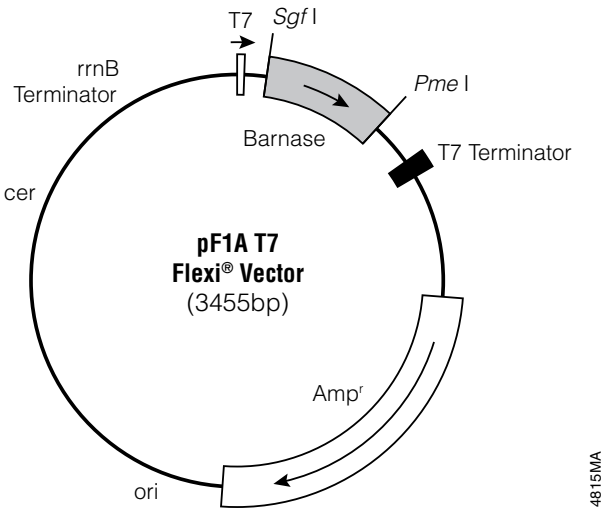
For additional information see page 348.



Untagged Flexi® Mammalian Expression Vectors

Product	Size	Cat.#
pF4A CMV Flexi® Vector	20 µg	C8481
pF4K CMV Flexi® Vector	20 µg	C8491
pF5A CMV-neo Flexi® Vector	20 µg	C9401
pF5K CMV-neo Flexi® Vector	20 µg	C9411
pF9A CMV *hRluc*-neo Flexi® Vector	20 µg	C9361

For Research Use Only. Not for Use in Diagnostic Procedures.

For additional information see page 124.

HaloTag® Fusion (C-Terminal) Mammalian Expression Vectors

Product	Size	Cat.#
pHTC HaloTag® CMV-neo Vector	20 µg	G7711
pFC27A HaloTag® CMV-neo Flexi® Vector	20 µg	G8421
pFC27K HaloTag® CMV-neo Flexi® Vector	20 µg	G8431
pFC14A HaloTag® CMV Flexi® Vector	20 µg	G9651
pFC14K HaloTag® CMV Flexi® Vector	20 µg	G9661
pFC15A HaloTag® CMV*d1* Flexi® Vector	20 µg	G1611
pFC15K HaloTag® CMV*d1* Flexi® Vector	20 µg	G1601
pFC16A HaloTag® CMV*d2* Flexi® Vector	20 µg	G1591
pFC16K HaloTag® CMV*d2* Flexi® Vector	20 µg	G1571
pFC17A HaloTag® CMV*d3* Flexi® Vector	20 µg	G1551
pFC17K HaloTag® CMV*d3* Flexi® Vector	20 µg	G1321

For Research Use Only. Not for Use in Diagnostic Procedures.

For additional information see page 347.

PinPoint™ Xa Protein Purification System

Product	Size	Cat.#
PinPoint™ Xa Protein Purification System	1 system	V2020
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The PinPoint™ Xa Protein Purification System is designed for the production and purification of fusion proteins that are biotinylated in vivo. The DNA coding for the protein of interest is cloned into a PinPoint™ Vector downstream of a sequence encoding a peptide that becomes biotinylated in vivo. Biotinylated fusion proteins are produced in *E. coli* and are affinity-purified using the SoftLink™ Soft Release Avidin Resin. This proprietary resin allows elution of the fusion protein under nondenaturing conditions. The PinPoint™ Vectors feature the encoded endoproteinase Factor Xa (pronounced "ten a") proteolytic site that provides a way to separate the purification tag from the native protein, and the vectors carry a convenient multiple cloning region for ease in construction of fusion proteins.

The system contains vectors in all possible sense reading frames, an avidin-conjugated resin, Streptavidin-Alkaline Phosphatase, a purification column and biotin. The PinPoint™ Xa Control Vector contains the chloramphenicol acetyltransferase (CAT) gene and is provided as a means of monitoring protein expression, purification and processing conditions. The system generally yields 1–5mg of protein per liter of culture.

Features:

- **In vivo Biotinylation Tag:** Allows purification of fusion proteins; many proteins produced have been soluble.
- **Easy to Use:** Purification of biotinylated proteins with the SoftLink™ Resin can be performed by column or batch purification.
- **Easy Detection:** Streptavidin Alkaline Phosphatase can be used to detect the biotinylated fusion protein in a pseudo-Western format to monitor purification.
- **Flexible:** PinPoint™ Vectors are supplied for all reading frames.
- **Gentle Release Conditions:** SoftLink™ Resin allows release of the fusion protein under nondenaturing conditions.
- *tac* Promoter: Allows tightly regulated expression.

Storage Conditions: Store the PinPoint™ Purification Column at room temperature. Store all remaining components at 4°C. The vectors may be stored at –20°C.

pALTER®-MAX Vector

Product	Size	Cat.#
pALTER®-MAX Vector	20 µg	Q5761
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The pALTER®-MAX Vector is a 5,534bp plasmid. It contains the human cytomegalovirus (CMV) immediate-early enhancer/promoter region for strong, constitutive expression of cloned DNA inserts in a variety of mammalian cell types. The pALTER®-MAX Vector as supplied is chloramphenicol-resistant and ampicillin-sensitive.

Storage Conditions: Store vector DNA at –20°C.

Available in the Helix® on-site stocking system

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Regulated Mammalian Expression System

Product	Size	Cat.#
Regulated Mammalian Expression System	1 system	C9470
Coumermycin A1	5 mg	C9451
Novobiocin Sodium Salt	1 g	C9461
Available Separately		
pReg neo Vector	20 µg	C9421
pF12A RM Flexi® Vector	20 µg	C9431
pF12K RM Flexi® Vector	20 µg	C9441

C9421, C9470, C9431, C9451, C9441 For Research Use Only. Not for Use in Diagnostic Procedures. C9461 For Research Use Only. Not for Use in Therapeutic or Diagnostic Procedures.

Description: The Regulated Mammalian Expression System features low basal levels, robust and rapid induction, and downregulation of gene expression in mammalian cells. The Regulated Mammalian Expression System is based on a novel on/off switch that relies on the rapid and sensitive modulation by coumerin-related compounds of a chimeric transactivator protein. Nanomolar concentrations of the antibiotic coumermycin promote homodimerization of a chimeric transactivator that, in turn, binds to lambda operator sequences located upstream of a minimal promoter driving transcription of coding sequences for a protein of interest. The levels of protein expression can be regulated by adjusting the coumermycin concentration. More significantly, this expression can be promptly and effectively switched off by adding novobiocin, which acts as an antagonist by dissociating the dimerized transactivator protein.

The protein coding region of interest is cloned into either the pF12A RM Flexi® Vector or pF12K RM Flexi® Vector, both of which are specially designed for Regulated Mammalian (RM) protein expression. These vectors incorporate regulatory promoter sequences upstream of the protein-coding region and are compatible with the Flexi® Vector System. In transient transfection paradigms, the pF12A or pF12K RM Flexi® Vector containing the protein-coding region of interest is co-transfected into mammalian cells together with the pReg neo Vector. The pReg neo Vector is designed to express a chimeric transactivator protein that interacts with the regulatory promoter region in the pF12A and pF12K RM Flexi® Vectors in a regulated fashion in response to coumermycin and novobiocin. Additionally, the pReg neo Vector encodes a neomycin phosphotransferase gene that allows stable cell selection and generation with the antibiotic G-418.

Features:

- **Enhanced Data:** High level of controlled induction combined with low basal protein expression.
- **Regulated Expression:** Dose-response induction of protein expression; rapid and sensitive on/off switch for protein expression.
- **Versatility:** Compatible with other Flexi® Vectors.

Storage Conditions: Store at –20°C.

CheckMate™/Flexi® Vector Mammalian Two-Hybrid System

Product	Size	Cat.#
CheckMate™/Flexi® Vector Mammalian Two-Hybrid System	1 each	C9360
Available Separately		
pFN10A (ACT) Flexi® Vector	20 µg	C9331
pFN11A (BIND) Flexi® Vector	20 µg	C9341
pGL4.31[*luc2P/GAL4*UAS/Hygro] Vector	20 µg	C9351
CheckMate™ Positive Control Vectors	1 set	C9370
CheckMate™ Negative Control Vectors	1 set	C9380

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Description: The CheckMate™/Flexi® Vector Mammalian Two-Hybrid System provides a means to confirm, validate and study suspected interactions between two proteins or domains and can also be used to generate stable cell lines for cell-based assays. Developed primarily for mammalian proteins of interest, the system can allow protein expression and post-translational modifications in an environment mimicking the native cell milieu. It is patterned on the yeast two-hybrid system with one protein of interest ("X") fused to a DNA-binding domain and the other protein ("Y") fused to a transcriptional activation domain.

The system relies upon three plasmids that are co-transfected into mammalian cells, each plasmid having unique features. The pFN10A (ACT) Flexi® Vector contains a herpes simplex virus VP16 transcriptional activation domain upstream of the cloning site, and the pFN11A (BIND) Flexi® Vector contains the yeast GAL4DNA-binding domain upstream of the cloning site. The pFN11A (BIND) Flexi® Vector also expresses the *Renilla reniformis* luciferase under the control of the SV40 promoter, allowing normalization for differences in transfection efficiency. The third vector, pGL4.31[*luc2P/GAL4*UAS/Hygro] Vector, contains five GAL4 binding sites upstream of a minimal TATA box, which is upstream of a firefly luciferase gene that acts as a reporter for interactions between proteins X and Y.

This system differs from the original CheckMate™ Mammalian Two-Hybrid System in that the vectors are compatible with the Flexi® Vector System, which allows directional cloning and rapid, efficient and high-fidelity transfer of protein coding regions between a variety of Flexi® Vectors.

Features:

- **Mammalian-Based System:** Interactions can be studied in the cell line of choice. Proteins are more likely to be in their native conformation. Post-translational modifications, such as glycosylation, phosphorylation and acylation, are better maintained.
- **Versatile:** Vectors are based on the Flexi® Cloning technology, enabling convenient transfer of protein-coding regions for additional functional proteomics applications.
- **Convenient:** The Dual-Luciferase® Reporter Assay System is used for detection.

Storage Conditions: Store at –20°C.

CheckMate™ Mammalian Two-Hybrid System

Product	Size	Cat.#
CheckMate™ Mammalian Two-Hybrid System	1 system	E2440

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Description: Two-hybrid systems are extremely powerful methods for detecting protein:protein interactions in vivo. The basis of two-hybrid systems is the modular domains found in some transcription factors: a DNA-binding domain, which binds to a specific DNA sequence, and a transcriptional activation domain, which interacts with the basal transcriptional machinery. A transcriptional activation domain in association with a DNA-binding domain will promote the assembly of RNA polymerase II complexes at the TATA box and increase transcription. In the CheckMate™ Mammalian Two-Hybrid System the DNA-binding domain and the transcriptional activation domain, produced by separate plasmids, are closely associated when one protein ("X") fused to a DNA-binding domain interacts with a second protein ("Y") fused to a transcriptional activation domain. In this system, interaction between proteins X and Y results in transcription of a reporter gene.

Features:

- **Mammalian System:** Interactions can be studied in the cell line of choice. Proteins are more likely to be in their native conformation. Post-translational modifications, such as glycosylation, phosphorylation and acylation, are better maintained.
- **Convenient Quantitation:** The Dual-Luciferase® Reporter Assay System is used for detection.
- **Internal Control:** *Renilla* luciferase normalizes transfection efficiency.
- **Fast Transient Assay:** Results obtained two days after transfection, as compared to 3–4 days with the yeast system.
- **Stable Transfectants:** The pACT Vector contains the neomycin phosphotransferase gene, which allows selection of stable transfectants.

Storage Conditions: Store at –20°C.

HQ and GST Tag Flexi® Vectors for *E. coli* and Cell-Free Protein Expression

Product	Size	Cat.#
pFN2A (GST) Flexi® Vector	20 µg	C8461
pFN2K (GST) Flexi® Vector	20 µg	C8471
pFN6A (HQ) Flexi® Vector	20 µg	C8511
pFN6K (HQ) Flexi® Vector	20 µg	C8521
pFC7A (HQ) Flexi® Vector	20 µg	C8531
pFC7K (HQ) Flexi® Vector	20 µg	C8541
pF1A T7 Flexi® Vector	20 µg	C8441
pF1K T7 Flexi® Vector	20 µg	C8451

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Description: These vectors are used for inducible expression of HQ- and GST-tagged fusion proteins in *E. coli* and cell-free systems using the T7 RNA polymerase promoter. The HQ tag and polyhistidine tag (His) are comparable in their affinity for Ni ions and will bind to all His-binding surfaces and resins. In certain cases the HQ-tagged proteins can be eluted from the affinity columns at lower concentrations of imidazole—a property useful for some downstream applications such as enzymatic reactions. As with His tag, proteins can be expressed from bacterial, insect and mammalian systems and purified under either native or denaturing conditions. The GST tag has been successfully used to boost tagged protein solubility during *E. coli* expression.

pFN2A/K (GST) Flexi® Vectors are designed for protein expression with an N-terminal GST tag in *E. coli* and T7 cell-free expression systems.

pFN6A/K (HQ) Flexi® Vectors are designed for protein expression with an N-terminal HQ tag in *E. coli* and T7 cell-free expression systems.

pFC7A/K (HQ) Flexi® Vectors are designed for protein expression with an C-terminal HQ in *E. coli* and T7 cell-free expression systems.

pF1A/K T7 Flexi® Vectors (Cat.# C8441, C8451) are designed for inducible expression of native untagged protein.

Note: Flexi® Vectors contain the lethal barnase gene to reduce background colonies without inserts during the subcloning procedure. Using the Flexi® Vector Cloning System replaces the barnase gene with your insert. These vectors, as purchased, cannot be cultured in normal laboratory strains of *E. coli* without an insert.

Features:

- **Easy to Implement and Reliable:** Choose between traditional His-affinity and GST-affinity resins for standard protein purification and prokaryotic expression applications.
- **Cost-Effective:** Technology for reusable and cost-efficient Ni (His-affinity) and gluthathione (GST-affinity) resins.
- **Versatile Cloning:** Choose from a variety of expression systems and fusion tag orientations and then transfer to others as required (for Flexi® system).
- **Time Savings:** Barnase insert (Flexi® system) decreases the number of background colonies, allowing efficient transfer of genetic constructs.

Storage Conditions: Store vectors at –20°C.

Available in the Helix® on-site stocking system

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HaloTag® Fusion (N-Terminal) Mammalian Expression Vectors

Product	Size	Cat.#
pHTN HaloTag® CMV-neo Vector	20 µg	G7721
pFN28A HaloTag® CMV-neo Flexi® Vector	20 µg	G8441
pFN28K HaloTag® CMV-neo Flexi® Vector	20 µg	G8451
pFN21A HaloTag® CMV Flexi® Vector	20 µg	G2821
pFN21K HaloTag® CMV Flexi® Vector	20 µg	G2831
pFN22A HaloTag® CMV*d1* Flexi® Vector	20 µg	G2841
pFN22K HaloTag® CMV*d1* Flexi® Vector	20 µg	G2851
pFN23A HaloTag® CMV*d2* Flexi® Vector	20 µg	G2861
pFN23K HaloTag® CMV*d2* Flexi® Vector	20 µg	G2871
pFN24A HaloTag® CMV*d3* Flexi® Vector	20 µg	G2881
pFN24K HaloTag® CMV*d3* Flexi® Vector	20 µg	G2981

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For additional information see page 347.

pAdVAntage™ Vector

Product	Size	Cat.#
pAdVAntage™ Vector	20 µg	E1711

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Description: Co-transfection of mammalian cells with the pAdVAntage™ Vector enhances transient protein expression in a variety of cell types by increasing translation initiation.

Transfection of mammalian cells with an expression vector often results in suboptimal expression of the protein of interest. Double-stranded RNA (dsRNA) generated during transfection is thought to activate the dsRNA-activated inhibitor (DAI), one of several enzymes involved in the host cell's antiviral defense system. DAI phosphorylates the translation initiation factor eIF-2, halting translation and therefore protein production.

However, DAI translation inhibition can be overcome with the adenoviral Virus Associated I RNA (VAI RNA) produced by RNA polymerase III following co-transfection with the pAdVAntage™ Vector. The VAI RNA binds to DAI, preventing its activation, thereby allowing translation and protein expression.

Features:

- **Increased Expression:** Co-transfection of pAdVAntage™ Vector with luciferase constructs showed at least a tenfold increase in luciferase expression in 293 and HeLa cell lines over transfections performed with the construct DNA alone.
- **Flexible:** Can be used in a variety of cell lines.

Storage Conditions: Store at –20°C.

pSI Mammalian Expression Vector

Product	Size	Cat.#
pSI Mammalian Expression Vector	20 µg	E1721

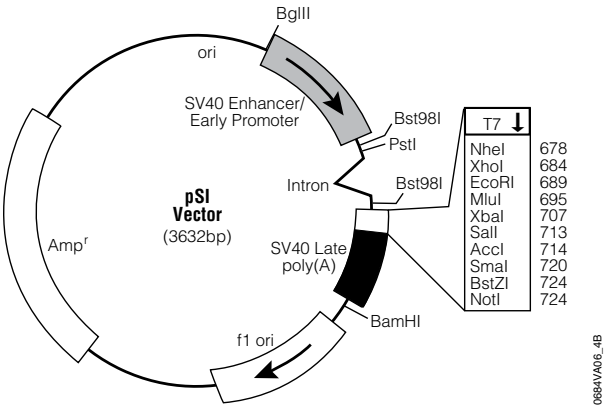
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The pSI Mammalian Expression Vector promotes constitutive expression of cloned DNA inserts in mammalian cells. The major difference between the pCI and pSI Mammalian Expression Vectors is the enhancer/promoter region controlling expression of the inserted gene. The pSI Expression Vector contains the simian virus 40 (SV40) enhancer and early promoter region. This vector can be used for both transient and stable expression of genes. For stable expression, the pSI Vector must be co-transfected with an expression vector containing a selectable gene for mammalian cells.

Features:

- **Strong, Constitutive Expression:** The pSI Vector's SV40 enhancer/promoter region allows strong, constitutive expression in most cell lines. The vector is maintained as an episome in cells expressing the SV40 large T antigen, leading to even higher levels of expression. A β-globin/IgG chimeric intron located downstream from the enhancer/promoter region can further increase expression.
- **Increased Steady-State mRNA Levels:** The late SV40 polyadenylation signal increases the steady-state level of RNA approximately fivefold more than the early SV40 polyadenylation signal.
- **Convenient:** Multiple cloning sites exist for easy insertion of cDNA.
- **Versatile:** Synthesize transcripts in vitro using the T7 RNA polymerase promoter or generate single-stranded DNA in *E. coli* using the f1 origin of replication.

Storage Conditions: Store at –20°C.



pCI Mammalian Expression Vector

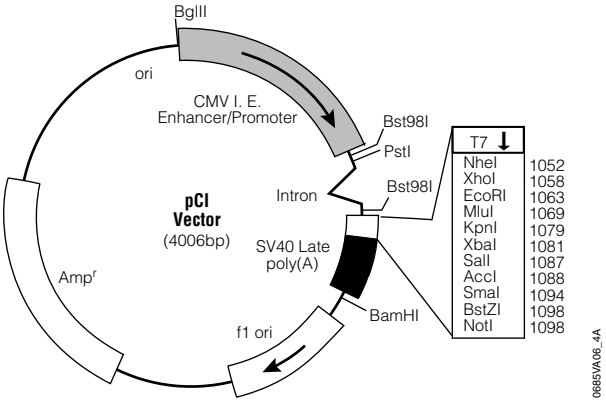
Product	Size	Cat.#
pCI Mammalian Expression Vector	20 µg	E1731
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The pCI Mammalian Expression Vector promotes constitutive expression of cloned DNA inserts in mammalian cells. The major difference between the pCI and pSI Mammalian Expression Vectors is the enhancer/promoter region controlling expression of the inserted gene. The pCI Expression Vector contains the human cytomegalovirus (CMV) major immediate-early gene enhancer/promoter region. This vector can be used for both transient and stable expression of genes. For stable expression, the pCI Vector must be co-transfected with an expression vector containing a selectable gene for mammalian cells.

Features:

- **Strong, Constitutive Expression:** The pCI Vector's CMV enhancer/promoter region enables strong, constitutive expression in many cell types. A β-globin/IgG chimeric intron located downstream of the enhancer/promoter region can further increase expression.
- **Increased Steady-State mRNA Levels:** The late SV40 polyadenylation signal increases the steady-state level of RNA approximately fivefold more than the early SV40 polyadenylation signal.
- **Convenient:** Multiple cloning sites exist for easy insertion of cDNA.
- **Versatile:** Synthesize transcripts in vitro using the T7 RNA polymerase promoter or generate single-stranded DNA in *E. coli* using the f1 origin of replication.

Storage Conditions: Store at –20°C.



pCI-neo Mammalian Expression Vector

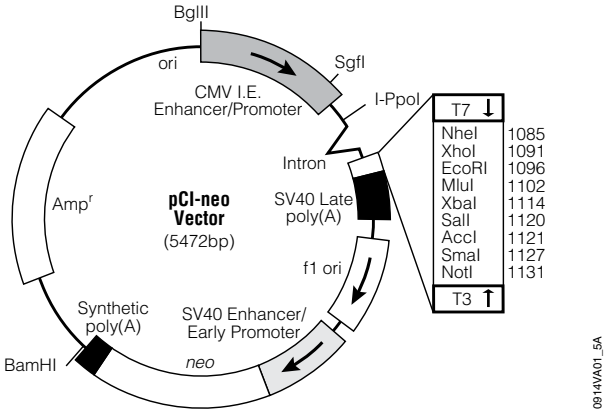
Product	Size	Cat.#
pCI-neo Mammalian Expression Vector	20 µg	E1841
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The pCI-neo Mammalian Expression Vector carries the human cytomegalovirus (CMV) immediate-early enhancer/promoter region to promote constitutive expression of cloned DNA inserts in mammalian cells. This vector also contains the neomycin phosphotransferase gene, a selectable marker for mammalian cells. The pCI-neo Vector can be used for transient or stable expression by selecting transfected cells with the antibiotic G-418.

Features:

- **Strong, Constitutive Expression:** The human cytomegalovirus (CMV) immediate-early enhancer/promoter region produces strong, constitutive expression. A β-globin/IgG chimeric intron located downstream from the enhancer/promoter region can further increase expression. The vector is maintained as an episome in cells expressing the SV40 large T antigen, leading to even higher levels of expression.
- **Transient or Stable Expression:** The neomycin phosphotransferase gene allows selection of stable transfected cells.
- **Increased Steady-State mRNA Levels:** The late SV40 polyadenylation signal increases the steady-state level of RNA approximately fivefold more than the early SV40 polyadenylation signal.
- **Convenient:** Multiple cloning sites exist for easy insertion of cDNA.
- **Versatile:** Synthesize transcripts in vitro using the T7 RNA polymerase promoter or generate single-stranded DNA in *E. coli* using the f1 origin of replication.

Storage Conditions: Store at –20°C.



Available in the Helix® on-site stocking system

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In Vitro Translation Specialty Vectors

Product	Size	Cat.#
pF3A WG (BYDV) Flexi® Vector	20 µg	L5671
pF3K WG (BYDV) Flexi® Vector	20 µg	L5681
pF25A ICE T7 Flexi® Vector	20 µg	L1061
pF25K ICE T7 Flexi® Vector	20 µg	L1081
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The Flexi® Vector System is a simple, yet powerful, directional cloning method for protein-coding sequences. It is based on two rare-cutting restriction enzymes, SgfI and PmeI, and provides a rapid, efficient and high-fidelity way to transfer protein-coding regions between a variety of Flexi® Vectors without the need to resequence.

The vectors are designed with special sequences for maximal cell-free protein expression in a specific system. The pF3A/K WG vectors were designed for use with Wheat Germ extracts and contain sequences from the barley yellow dwarf virus (BYDV), an RNA plant virus, upstream and downstream of the protein coding region of interest. The BYDV elements interact with each other, form a closed loop and act synergistically to stimulate translation in wheat germ extracts, bypassing mRNA cap and polyadenylation dependencies. The pF25A/K ICE Vectors were designed for use with Insect Cell Extracts and contain untranslated region (UTR) sequences at the 5′ and 3′ ends of the gene coding region to enhance translation efficiency.

Note: Flexi® Vectors contain the lethal barnase gene to reduce background colonies without inserts during the subcloning procedure. Using the Flexi® Vector Cloning System replaces the barnase gene with your insert. These vectors, as purchased, cannot be cultured in normal laboratory strains of *E. coli* without an insert.

Features:

- **Versatility:** You can choose between a variety of initial applications (e.g., bacterial protein, mammalian, or cell-free protein expression) and then transfer to others as required.
- **Time Savings:** Efficient transfer allows direct use of recombinant clones, minimizing time wasted screening background colonies.
- **Enhanced Productivity:** Adaptable to high-throughput formats for large screening projects.
- **Easy Access:** No licensing fees or complicated transfer restrictions.

Storage Conditions: Store vectors at –20°C.

pTNT™ Vector

Product	Size	Cat.#
pTNT™ Vector	20 µg	L5610
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The pTNT™ Vector is designed for the convenient in vitro expression of cloned genes. Both SP6 and T7 polymerase promoters lie in tandem adjacent to the multiple cloning site. This permits gene expression from either an SP6- or T7-based coupled in vitro transcription/translation system. The presence of RNA phage promoters also allows the highly efficient synthesis of RNA in vitro. The pTNT™ Vector also contains a 5′ β-globin leader sequence and synthetic poly(A)$_{30}$ tail, both of which have been shown to enhance expression of certain genes.

Features:

- **Flexible:** The vector contains tandem SP6 and T7 phage promoters allowing use in the appropriate in vitro translation or transcription system.
- **Convenient:** Multiple cloning site provides a selection of restriction sites for cloning.

Storage Conditions: Store at –20°C.

pCMVTNT™ Vector

Product	Size	Cat.#
pCMVTNT™ Vector	20 µg	L5620
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The pCMVTNT™ Vector is designed for the convenient expression of cloned genes using both in vivo and in vitro expression systems. Both SP6 and T7 polymerase promoters lie in tandem adjacent to the multiple cloning site. This allows gene expression from either an SP6- or T7-based coupled in vitro transcription/translation system. The presence of RNA phage promoters also allows the highly efficient synthesis of RNA in vitro. The pCMVTNT™ Vector also contains a 5′ β-globin leader sequence that has been referenced for enhanced expression of certain genes in vitro. For in vivo expression, the vector contains a CMV enhancer/promoter region, which allows strong constitutive expression in many cell types. A β-globin/IgG chimeric intron is located downstream from the enhancer/promoter region. The late SV40 polyadenylation site is located downstream of the multiple cloning site.

Features:

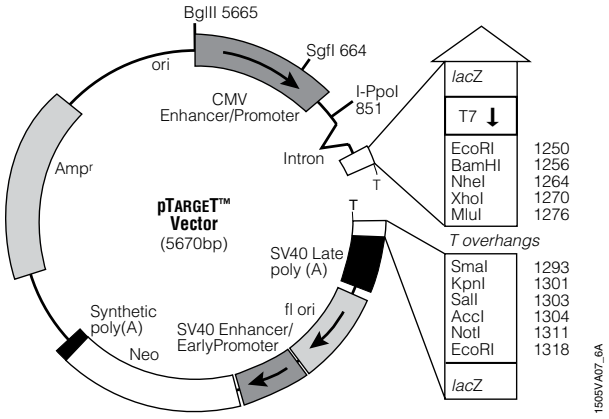
- **In Vivo Expression:** The CMV enhancer/promoter region allows strong constitutive expression in many cell types.
- **Flexible:** The vector contains tandem SP6 and T7 phage promoters allowing use in the appropriate in vitro translation or transcription system.
- **Convenient:** Multiple cloning site provides a selection of restriction sites for cloning.

Storage Conditions: Store at –20°C.

pTARGET™ Mammalian Expression Vector System

Product	Size	Cat.#
pTARGET™ Mammalian Expression Vector System	20 reactions	A1410
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 198.



Available in the Helix® on-site stocking system

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Reporter Vectors

NanoLuc® Genetic Reporter Vectors

Product	Size	Conc.	Cat.#
pNL1.1[*Nluc*] Vector	20 µg		N1001
pNL1.2[*NlucP*] Vector	20 µg		N1011
pNL1.3[*secNluc*] Vector	20 µg		N1021
pNL3.1[*Nluc*/minP] Vector	20 µg		N1031
pNL3.2[*NlucP*/minP] Vector	20 µg		N1041
pNL3.3[*secNluc*/minP] Vector	20 µg		N1051
pNL2.1[*Nluc*/Hygro] Vector	20 µg		N1061
pNL2.2[*NlucP*/Hygro] Vector	20 µg		N1071
pNL2.3[*secNluc*/Hygro] Vector	20 µg		N1081
pNL1.1.CMV[*Nluc*/CMV] Vector	20 µg		N1091
pNL1.3.CMV[*secNluc*/CMV] Vector	20 µg		N1101
pNL3.2.NF-κB-RE[*NlucP*/NF-κB-RE/Hygro] Vector	20 µg		N1111
pNL3.2.CMV Vector	20 µg	1 µg/µl	N1411
pNL1.1.PGK[*Nluc*/PGK] Vector	20 µg		N1441
pNL1.1.TK[*Nluc*/TK] Vector	20 µg		N1501

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: NanoLuc® (Nluc) luciferase is a small enzyme (19.1kDa) engineered for optimal performance as a luminescent reporter. The enzyme is about 100-fold brighter than either firefly (*Photinus pyralis*) or *Renilla reniformis* luciferase using a novel substrate, furimazine, to produce high intensity, glow-type luminescence. The luminescent reaction is ATP-independent and designed to suppress background luminescence for maximal assay sensitivity.

For use as a genetic reporter, multiple forms of NanoLuc® luciferase have been configured to meet differing experimental objectives. Unfused Nluc offers maximal light output and sensitivity, NanoLuc®-PEST (NlucP) closely couples protein expression to changes in transcriptional activity and increased signal-to background ratios, and NanoLuc® luciferase fused to an N-terminal secretion signal (secNluc) is suitable when a secreted reporter is preferred. Luminescence is linearly proportional to the amount of NanoLuc® protein over a 1,000,000-fold concentration range, with a signal half-life ≥2 hours when detected with Nano-Glo® Luciferase Assay Reagent.

NanoLuc® luciferase possesses a number of physical properties that make it an excellent reporter protein:

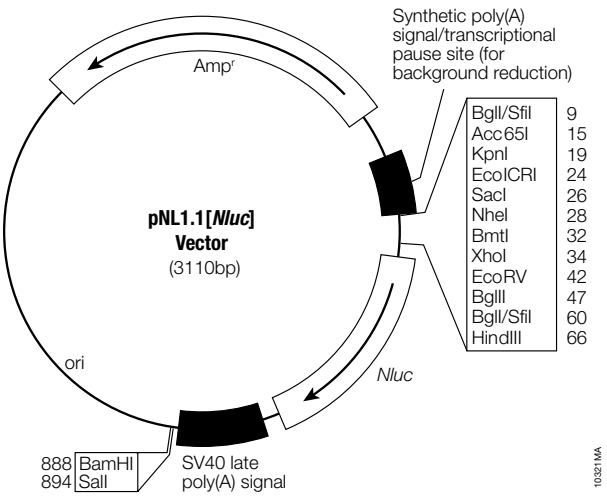
- very small, monomeric enzyme (171 amino acids; 513bp)
- high thermal stability (T_m = 60°C)
- active over a broad pH range (pH 6–8)
- no post-translational modifications or disulfide bonds
- uniform distribution in cells
- emission spectrum well suited for bioluminescence resonance energy transfer (BRET; λmax = 465nM).

NanoLuc® luciferase is made available in a variety of plasmids designed for use in reporter gene assays of transcriptional control and with each of the NanoLuc® forms (unfused Nluc, PEST destabilized NlucP, and secreted secNluc). The different pNL variations are designed for the following:

- pNL1: cloning of a known or putative promoter region
- pNL2: cloning of a known or putative promoter region and establishment of a stable cell line through Hygromycin selection
- pNL3: cloning of a binding site or response element not in need of a basic promoter (such as are present in the pNL3.2.NF-κB-RE vector)
- Control plasmids for the unfused, PEST-destabilized and secreted Nluc forms also are available.

The pNL vectors series use a pGL4-based backbone for easy sequence transfer from existing plasmids. This backbone design also reduces anomalous results by removing many transcription factor binding sites and other potential regulatory elements. The Nluc gene variations are codon optimized and have had many potential regulatory elements or other undesirable features removed (such as common restriction enzyme sites).

Storage Conditions: Store at –20°C.



NanoLuc® Protein Fusion Vectors

Product	Size	Conc.	Cat.#
pFN31A *Nluc* CMV-Hygro Flexi® Vector	20 µg	1 µg/µl	N1311
pFN31K *Nluc* CMV-neo Flexi® Vector	20 µg	1 µg/µl	N1321
pFC32A *Nluc* CMV-Hygro Flexi® Vector	20 µg	1 µg/µl	N1331
pFC32K *Nluc* CMV-neo Flexi® Vector	20 µg	1 µg/µl	N1341
pNLF1-N [CMV/Hygro] Vector	20 µg	1 µg/µl	N1351
pNLF1-C [CMV/Hygro] Vector	20 µg	1 µg/µl	N1361
pNLF1-secN [CMV/Hygro] Vector	20 µg	1 µg/µl	N1371
Transfection Carrier DNA	5 × 20 µg	1 µg/µl	E4881

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Description: The small size (19.1kDa) and extreme brightness (about 100-fold brighter than either firefly [*Photinus pyralis*] or *Renilla reniformis*) of NanoLuc® luciferase (Nluc) make it an ideal protein fusion partner. NanoLuc® fusion proteins can be used in a variety of applications including: reporters of protein stability, probes for bioluminescent cell imaging (BLI) or as the donor signal in bioluminescent resonance energy transfer (BRET) applications for protein:protein or protein:small-molecule interaction studies.

The NanoLuc® protein fusion vectors enable simple generation of N or C terminal fusions of NanoLuc® luciferase with your protein of interest and are available in two formats to accommodate your cloning preferences:

- pNLF Vector series: Generate N or C terminal fusions to the full-length Nluc protein or attach secreted Nluc to the N terminus of the protein of interest using traditional cloning with a multiple cloning site (MCS).
- pF Vector series: Generate N or C terminal Nluc fusion proteins using the Flexi® Vector Cloning System—a directional cloning method based on two rare-cutting restriction enzymes, SgfI and PmeI, that provides a rapid, efficient and high-fidelity way to transfer protein-coding regions between a variety of Flexi® Vectors without the need to resequence.

Features:

- **Easily Quantify Changes in Protein Abundance:** Use the single-addition Nano-Glo® Luciferase Assay System to quantify the signal from NanoLuc® fusion proteins to measure intracellular protein levels.
- **Obtain Improved Biological Relevance:** Bright NanoLuc® reporter allows endogenous expression levels of NanoLuc® fusion proteins to avoid overexpression artifacts.
- **Visualize Intracellular Protein Dynamics:** Bright NanoLuc® reporter allows reduced imaging exposure times without the need for repeated sample excitation, which can result in cytotoxic artifacts.
- **Improve BRET Studies:** The brighter signal and blue-shifted emission spectrum from NanoLuc® luciferase result in less spectral overlap with fluorescent acceptors, resulting in better signal:background and dynamic range for BRET applications.
- **Flexible Cloning Options:** Easily attach NanoLuc® luciferase to the N or C terminus of your protein of interest using either traditional or Flexi® cloning systems.
- **Easily Transition from Transient to Stable Cells:** All vectors contain a mammalian selectable marker to create a stable line.

Storage Conditions: Store at –20°C.

NanoLuc® Stability Sensors for Cell Signaling

Product	Size	Conc.	Cat.#
pNLF1-HIF1A [CMV/neo] Vector	1 each	1 µg/µl	N1381
pNLF1-NRF2 [CMV/neo] Vector	1 each	1 µg/µl	N1391

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The rate of protein turnover is tightly regulated for many signaling proteins involved in oncogenesis and response to cellular stress. Protein stabilization and subsequent accumulation occurs in response to changing cellular conditions resulting in activation of downstream transcriptional events. The NanoLuc® Stability Sensors are ready-to-use vector systems that utilize the advantages of the NanoLuc® luciferase reporter to enable stability studies of two key signaling proteins, HIF1A and NRF2, providing a method to directly measure this primary signaling event.

HIF1A Vector System: The HIF1A Vector System enables simple quantification of intracellular HIF1A protein levels to study the dynamics of this signaling protein in mediating cellular response to hypoxia. It contains a vector encoding NanoLuc® fused to the C terminus of the HIF1A protein under control of the CMV promoter plus Transfection Carrier DNA to allow titratable intracellular fusion protein expression.

NRF2 Vector System: The NRF2 Vector System enables simple quantification of intracellular NRF2 protein levels to study the dynamics of this signaling protein in mediating cellular response to oxidative stress. It contains a vector encoding NanoLuc® fused to the C terminus of the NRF2 protein under the control of the CMV promoter, a pKEAP1-expressing vector for proper regulation of intracellular NRF2 levels and Transfection Carrier DNA for titratable intracellular fusion protein expression.

Features:

- **Ready to Use:** Constructs are predesigned, optimized and tested for low endotoxin levels.

Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system
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Coincidence Reporter Vectors

Product	Size	Cat.#
pNLCol1[*luc2*-P2A-*NlucP*/Hygro] Vector	20 µg	N1461
pNLCol2[*luc2*-P2A-*NlucP*/minP/Hygro] Vector	20 µg	N1471
pNLCol3[*luc2*-P2A-*NlucP*/CMV/Hygro] Vector	20 µg	N1481
pNLCol4[*luc2*-P2A-*NlucP*/PGK/Hygro] Vector	20 µg	N1491

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Description: Luciferase-based reporter-gene assays remain a useful and powerful method of high-throughput compound screening. However, false hits that result from direct interaction of compounds with the luciferase reporter can result in unnecessary follow-up efforts. The pNLCol Vectors comprise a second-generation coincidence reporter vector system that allow expression of both firefly luciferase (*luc2*) and NanoLuc® Luciferase fused to a PEST destabilization domain (*NlucP*) from the same mRNA transcript. The stoichiometric expression of both luciferases is achieved by use of the P2A sequence from porcine teschovirus-1, which promotes a ribosomal skip and expression of the two unfused enzymes with distinct compound interaction profiles. When used in high-throughput compound screening, false hits caused by direct interaction with one or the other luciferases can be distinguished from true hits that show a similar response for both, reducing workload associated with follow-up screens.

The pNLCol Vectors are designed for use with the Nano-Glo® Dual-Luciferase® Reporter (NanoDLR™) Assay System, which allows sequential detection of firefly and NanoLuc® Luciferase in activity in the same sample. Both reagents provide stable glow-type luminescence signals with half-lives of approximately two hours allowing batch processing of samples and amenable to assays or screens in 96-, 384- or 1,536-well plate formats. Potent inhibition of firefly luciferase coupled with the high-intensity luminescence of NanoLuc® luciferase maximizes sensitivity for detection of both reporters.

Features:

- **Improve Confidence and Save Time:** Use of two different transcriptional reporters reduces false hit rates, increases the identification of true biological hits and eliminates time wasted on false-positive follow-up.
- **Employ Robust and Sensitive Reporter Pair:** *luc2* and *NlucP* provide a bright reporter combination compatible with low-copy-number and plate scale up, and provide greater signal-to-background compared to other reporters.
- **Efficiently Identify False Hits:** Firefly and NanoLuc® luciferase have dissimilar profiles of compound interference, enabling the identification of more false-positives than when either reporter is used alone.
- **Use Simple Detection Format:** Convenient "add-read-add-read" homogeneous format of NanoDLR™ assay is ideal for automation and HTS approaches.

Storage Conditions: Store at –20°C.

Signaling Pathway Analysis (Minimal Promoter-Driven) Firefly Luciferase Vectors

Product	Size	Cat.#
pGL4.37[*luc2P*/ARE/Hygro] Vector	20 µg	E3641
pGL4.38[*luc2P*/p53 RE/Hygro] Vector	20 µg	E3651
pGL4.39[*luc2P*/ATF6 RE/Hygro] Vector	20 µg	E3661
pGL4.40[*luc2P*/MRE/Hygro] Vector	20 µg	E4131
pGL4.41[*luc2P*/HSE/Hygro] Vector	20 µg	E3751
pGL4.42[*luc2P*/HRE/Hygro] Vector	20 µg	E4001
pGL4.43[*luc2P*/XRE/Hygro] Vector	20 µg	E4121
pGL4.44[*luc2P*/AP1 RE/Hygro] Vector	20 µg	E4111
pGL4.45[*luc2P*/ISRE/Hygro] Vector	20 µg	E4141
pGL4.47[*luc2P*/SIE/Hygro] Vector	20 µg	E4041
pGL4.48[*luc2P*/SBE/Hygro] Vector	20 µg	E3671
pGL4.49[*luc2P*/TCF-LEF RE/Hygro] Vector	20 µg	E4611
pGL4.52[*luc2P*/STAT5RE/Hygro] Vector	20 µg	E4651
pGL4.29[*luc2P*/CRE/Hygro] Vector	20 µg	E8471
pGL4.30[*luc2P*/NFAT-RE/Hygro] Vector	20 µg	E8481
pGL4.32[*luc2P*/NF-κB-RE/Hygro] Vector	20 µg	E8491
pGL4.33[*luc2P*/SRE/Hygro] Vector	20 µg	E1340
pGL4.34[*luc2P*/SRF-RE/Hygro] Vector	20 µg	E1350
Available Separately		
pGL4.23[*luc2*/minP] Vector	20 µg	E8411
pGL4.24[*luc2P*/minP] Vector	20 µg	E8421
GloResponse™ NFAT-RE-*luc2P* HEK293 Cell Line	2 vials	E8510
GloResponse™ NF-κB-RE-*luc2P* HEK293 Cell Line	2 vials	E8520
pGL4.25[*luc2CP*/minP] Vector	20 µg	E8431
pGL4.26[*luc2*/minP/Hygro] Vector	20 µg	E8441
pGL4.27[*luc2P*/minP/Hygro] Vector	20 µg	E8451
pGL4.28[*luc2CP*/minP/Hygro] Vector	20 µg	E8461
GloResponse™ CRE-*luc2P* HEK293 Cell Line	2 vials	E8500

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Description: Creating a cell line with an indicator of a functional signaling pathway is useful for deciphering the components in a signaling pathway. These tools are made by insertion of multiple repeats of a response element upstream of a minimal promoter (minP). Promega has designed vectors that report the activity of a variety of pathways using the optimized *luc2* firefly luciferase gene in the pGL4 backbone. These vectors also have a hygromycin resistance selectable marker, allowing use either in transient transfection experiments or for selection of a stable cell line.

Also available for construction of pathway reporters are minimal promoter (minP) vectors with three varieties of engineered firefly luciferase genes: *luc2, luc2P* or *luc2CP*. The *luc2* gene is engineered to remove most cryptic transcription factor binding sites and improve mammalian expression through codon optimization. The *luc2P* and *luc2CP* and RapidResponse™ genes are *luc2* genes appended with degradation sequences to influence the cellular half-life of the luc2 gene. The RapidResponse™ genes respond more rapidly to stimuli but at the expense of signal intensity. The *luc2P* (1-hour half-life) gene responds more rapidly than *luc2* (3-hour half-life) with moderate signal intensity, and the *luc2CP* (0.4-hour half-life) responds more quickly with the lowest signal intensity. The minP vectors are available with or without selectable markers (hygromycin). To speed research, several pre-designed response element vectors are available already assembled in the pGL4.27 Vector. Some of these also are available stable cell lines (GloResponse™ Cell Lines).

Features:

- Pre-designed vectors remove the need to clone and validate an assay.
- **Increased Reporter Gene Expression:** Codon optimization of synthetic genes for mammalian expression.
- **Reduced Background and Risk of Expression Artifacts:** Removal of cryptic DNA regulatory elements and transcription factor binding sites.
- **Improved Temporal Response:** Rapid Response™ technology using destabilized luciferase genes.
- **Easy Transition from Transient to Stable Cells:** Choice of mammalian selectable markers.

Storage Conditions: Store at –20°C.

Promoter-Driven Control Firefly and *Renilla* Luciferase Vectors

Product	Size	Cat.#
pGL4.50[*luc2*/CMV/Hygro] Vector	20 µg	E1310
pGL4.51[*luc2*/CMV/Neo] Vector	20 µg	E1320
pGL4.13[*luc2*/SV40] Vector	20 µg	E6681
pGL4.53[*luc2*/PGK] Vector	20 µg	E5011
pGL4.54[*luc2*/TK] Vector	20 µg	E5061
pGL4.73[*hRluc*/SV40] Vector	20 µg	E6911
pGL4.74[*hRluc*/TK] Vector	20 µg	E6921
pGL4.75[*hRluc*/CMV] Vector	20 µg	E6931
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For additional information see page 87.

Promoterless Firefly Luciferase Vectors

Product	Size	Cat.#
pGL4.10[*luc2*] Vector	20 µg	E6651
pGL4.11[*luc2P*] Vector	20 µg	E6661
pGL4.12[*luc2CP*] Vector	20 µg	E6671
pGL4.14[*luc2*/Hygro] Vector	20 µg	E6691
pGL4.15[*luc2P*/Hygro] Vector	20 µg	E6701
pGL4.16[*luc2CP*/Hygro] Vector	20 µg	E6711
pGL4.17[*luc2*/Neo] Vector	20 µg	E6721
pGL4.18[*luc2P*/Neo] Vector	20 µg	E6731
pGL4.19[*luc2CP*/Neo] Vector	20 µg	E6741
pGL4.20[*luc2*/Puro] Vector	20 µg	E6751
pGL4.21[*luc2P*/Puro] Vector	20 µg	E6761
pGL4.22[*luc2CP*/Puro] Vector	20 µg	E6771
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For additional information see page 87.

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Promoterless *Renilla* Luciferase Vectors

Product	Size	Cat.#
pGL4.70[*hRluc*] Vector	20 µg	E6881
pGL4.71[*hRlucP*] Vector	20 µg	E6891
pGL4.72[*hRlucCP*] Vector	20 µg	E6901
pGL4.76[*hRluc*/Hygro] Vector	20 µg	E6941
pGL4.77[*hRlucP*/Hygro] Vector	20 µg	E6951
pGL4.78[*hRlucCP*/Hygro] Vector	20 µg	E6961
pGL4.79[*hRluc*/Neo] Vector	20 µg	E6971
pGL4.80[*hRlucP*/Neo] Vector	20 µg	E6981
pGL4.81[*hRlucCP*/Neo] Vector	20 µg	E6991
pGL4.82[*hRluc*/Puro] Vector	20 µg	E7501
pGL4.83[*hRlucP*/Puro] Vector	20 µg	E7511
pGL4.84[*hRlucCP*/Puro] Vector	20 µg	E7521
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For additional information see page 88.

Nuclear Receptor Analysis Luciferase Vectors

Product	Size	Cat.#
pGL4.36[*luc2P*/MMTV/Hygro] Vector	20 µg	E1360
pFN26A (BIND) *hRluc*-neo Flexi® Vector	20 µg	E1380
pBIND-ERα Vector	20 µg	E1390
pBIND-GR Vector	20 µg	E1581
pGL4.35[*luc2P*/9X*GAL4*UAS/Hygro] Vector	20 µg	E1370
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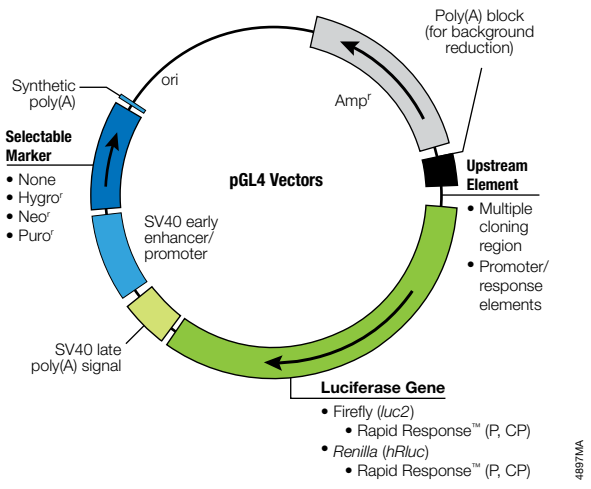
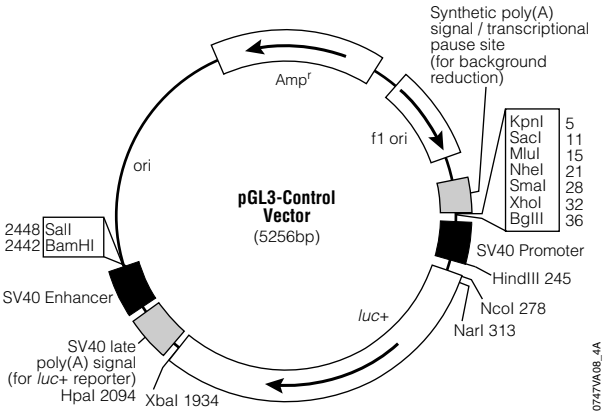
For additional information see page 89.



pGL3 Luciferase Reporter Vectors

Product	Size	Cat.#
pGL3-Basic Vector	20 µg	E1751
pGL3-Control Vector	20 µg	E1741
pGL3-Enhancer Vector	20 µg	E1771
pGL3-Promoter Vector	20 µg	E1761
For Research Use Only. Not for Use in Diagnostic Procedures.		

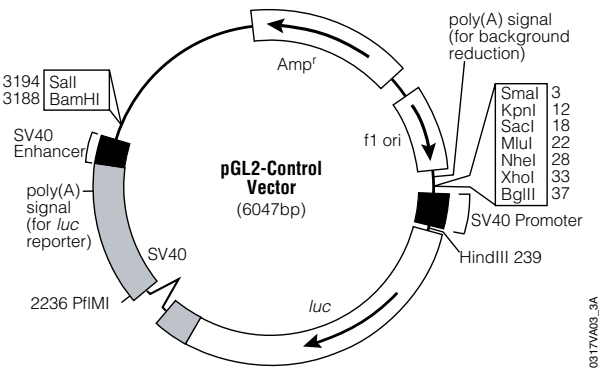
For additional information see page 91.



pGL2 Luciferase Reporter Vectors

Product	Size	Cat.#
pGL2-Basic Vector	20 µg	E1641
pGL2-Control Vector	20 µg	E1611
pGL2-Enhancer Vector	20 µg	E1621
pGL2-Promoter Vector	20 µg	E1631
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 91.



pmirGLO Dual-Luciferase miRNA Target Expression Vector

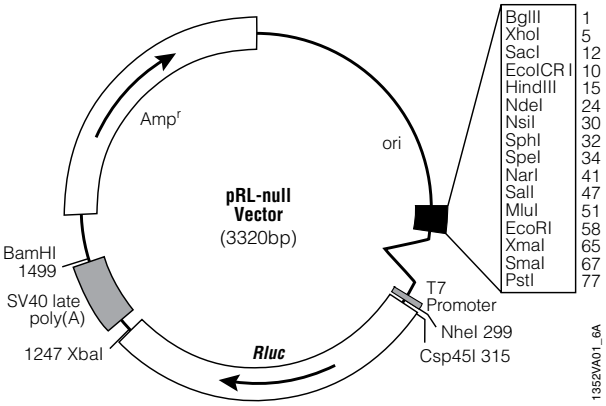
Product	Size	Cat.#
pmirGLO Dual-Luciferase miRNA Target Expression Vector	20 µg	E1330
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 90.

pRL *Renilla* Luciferase Control Reporter Vectors

Product	Size	Cat.#
pRL-SV40 Vector	20 µg	E2231
pRL-TK Vector	20 µg	E2241
pRL-CMV Vector	20 µg	E2261
pRL-null Vector	20 µg	E2271
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 90.



pGEM®-*luc* DNA

Product	Size	Cat.#
pGEM®-*luc* DNA	20 µg	E1541
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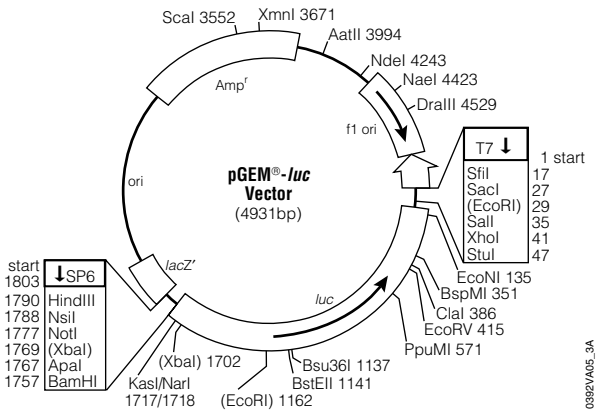
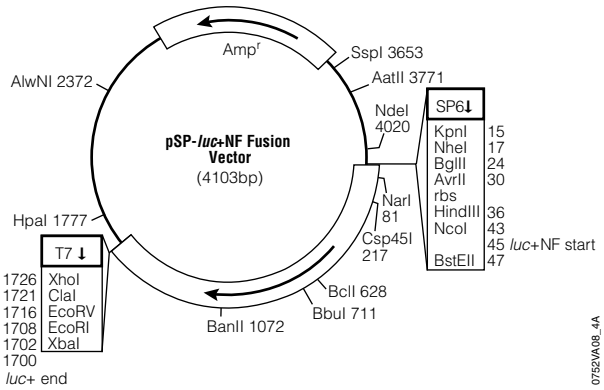
For additional information see page 92.



pSP-*luc*+NF Fusion Vector

Product	Size	Cat.#
pSP-*luc*+NF Fusion Vector	20 µg	E4471
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 93.



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pSV-β-Galactosidase Control Vector

Product	Size	Cat.#
pSV-β-Galactosidase Control Vector	20 µg	E1081

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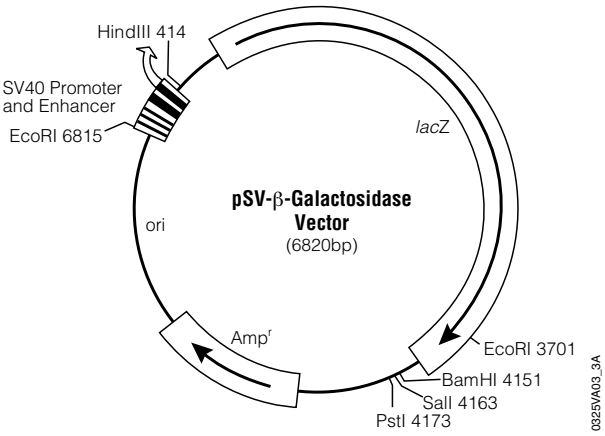
For additional information see page 94.

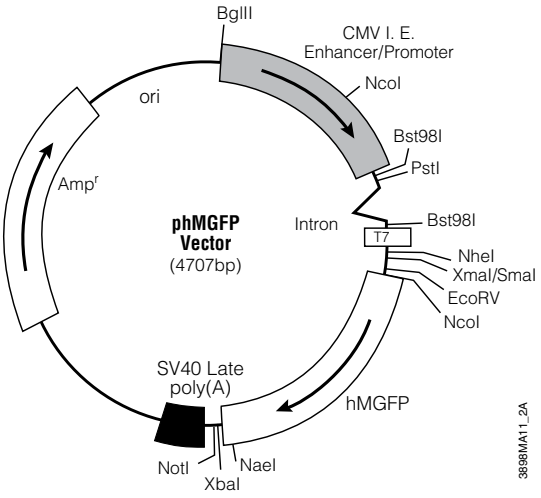


Monster Green® Fluorescent Protein phMGFP Vector

Product	Size	Cat.#
Monster Green® Fluorescent Protein phMGFP Vector	20 µg	E6421

For Research Use Only. Not for Use in Diagnostic Procedures.

For additional information see page 94.



Promega

Bioassays for Biologics

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Bioassays for Biologics

Products tagged with the Helix® icon are available for distribution through our convenient on-site stocking program in a freezer, refrigerated unit or an ambient cabinet.

For more information visit: **www.promega.com/helix**

Available in the Helix® on-site stocking system

Cytokine and Growth Factor Bioassays

IL-2 Bioassay

Product	Size	Cat.#
IL-2 Bioassay	1 each	JA2201
IL-2 Bioassay 5X	5 each	JA2205
IL-2 Bioassay, Korea	1 each	JA3301
IL-2 Bioassay 5X, Korea	5 each	JA3305
IL-2 Bioassay, Taiwan	1 each	JA4401
IL-2 Bioassay 5X, Taiwan	5 each	JA4405
Available Separately		
IL-2 Bioassay, Propagation Model	1 each	J2952
Not for Medical Diagnostic Use. All products not available in all countries.		

Description: Interleukin-2 (IL-2), originally described as "T-cell growth factor" in 1976, is a small 15.5kDa monomer secreted by a variety of cell types including CD4+ and CD8+ T cells, natural killer (NK) cells and activated dendritic cells. IL-2 has pleiotropic effects on the immune system. It plays a critical role in the generation, maintenance and expansion of CD4+ regulatory T cells, promotes the cytotoxic activity of NK and CD8+ cells and governs homeostasis through the elimination of harmful autoreactive T cells via activation-induced cell death.

The IL-2 Bioassay is a bioluminescent cell-based assay designed to measure IL-2 stimulation or inhibition using the STAT-5 response element as a readout. The IL-2 Bioassay is provided in a thaw-and-use format as cryopreserved cells that can be thawed, plated and used in an assay without the need for cell propagation. The IL-2 Bioassay is also available in a Cell Propagation Model (CPM) format, which includes cryopreserved cells that can be thawed, propagated and banked for long-term use (IL-2 Bioassay, Propagation Model.

Features:

- Prequalified according to ICH guidelines
- Mechanism-of-action-based assay
- No primary cell culture required

Note: IL-2 Bioassay components are shipped separately because of differing temperature requirements. The IL-2 Bioassay Cells are shipped on dry ice. The Bio-Glo™ Luciferase Assay System and Fetal Bovine Serum are shipped on dry ice, separately from the cells. The RPMI 1640 Medium is shipped at ambient temperature.

Storage Conditions:

- Upon arrival, immediately transfer the cell vials to below –140°C (freezer or liquid nitrogen vapor phase) for long-term storage. Do not store cell vials submerged in liquid nitrogen. Do not store cell vials at –80°C because this will decrease cell viability and cell performance.
- Store Bio-Glo™ Luciferase Assay Substrate, Bio-Glo™ Luciferase Assay Buffer and Fetal Bovine Serum at –20°C. Avoid multiple freeze-thaw cycles of the serum.
- For optimal performance, use reconstituted Bio-Glo™ Reagent on the day of preparation. However, once reconstituted, Bio-Glo™ Reagent can be stored at –20°C for up to 6 weeks.
- Store RPMI Medium at 4°C protected from light.

IL-15 Bioassay

Product	Size	Cat.#
IL-15 Bioassay	1 each	JA2011
IL-15 Bioassay 5X	5 each	JA2015
IL-15 Bioassay, Korea	1 each	JA3011
IL-15 Bioassay 5X, Korea	5 each	JA3015
IL-15 Bioassay, Taiwan	1 each	JA4011
IL-15 Bioassay 5X, Taiwan	5 each	JA4015
Available Separately		
IL-15 Bioassay, Propagation Model	1 each	J2962
Not for Medical Diagnostic Use. All products not available in all countries.		

Description: Interleukin-15 (IL-15) is secreted by a variety of cell types including monocytes, macrophages, dendritic and epithelial cells. IL-15 promotes activation and expansion of natural killer (NK), natural killer T (NKT) and CD8+ memory T cells. Unlike IL-2, IL-15 doesn't impact CD4+ regulatory T cells (Treg) or induce activation-induced cell death (AICD).

Multiple pathways can be activated by IL-15 signaling. In lymphocytes, JAK/STAT signaling begins with JAK1 and JAK3 tyrosine kinase recruitment and activation at the receptor cytoplasmic domains. These kinases recruit and activate STAT3 and 5 with phosphorylated dimer/tetramer translocation to the nucleus for transcriptional activation of a variety of proteins. These pathways impact cell proliferation, anti-apoptotic survival and cytotoxic effector functions.

The IL-15 Bioassay is a bioluminescent cell-based assay designed to measure IL-15 stimulation or inhibition using the STAT-5 response element as a readout. The IL-15 Bioassay is provided in a thaw-and-use format as cryopreserved cells that can be thawed, plated and used in an assay without the need for cell propagation. The IL-15 Bioassay is also available in a Cell Propagation Model format, which includes cryopreserved cells that can be thawed, propagated and banked for long-term use.

Features:

- Prequalified according to ICH guidelines
- Mechanism-of-action-based assay
- No primary cell culture required

Note: IL-15 Bioassay components are shipped separately because of differing temperature requirements. The IL-15 Bioassay Cells are shipped on dry ice. The Bio-Glo™ Luciferase Assay System and Fetal Bovine Serum are shipped on dry ice, separately from the cells. The RPMI 1640 Medium is shipped at ambient temperature.

Storage Conditions:

- Upon arrival, immediately transfer the cell vials to below –140°C (freezer or liquid nitrogen vapor phase) for long-term storage. Do not store cell vials submerged in liquid nitrogen. Do not store cell vials at –80°C because this will decrease cell viability and cell performance.
- Store Bio-Glo™ Luciferase Assay Substrate, Bio-Glo™ Luciferase Assay Buffer and Fetal Bovine Serum at –20°C. Avoid multiple freeze-thaw cycles of the serum.
- For optimal performance, use reconstituted Bio-Glo™ Reagent on the day of preparation. However, once reconstituted, Bio-Glo™ Reagent can be stored at –20°C for up to 6 weeks.
- Store RPMI 1640 Medium at 4°C protected from light.

VEGF Bioassays

Product	Size	Cat.#
VEGF Bioassay	1 each	GA2001
VEGF Bioassay 5X	5 each	GA2005
VEGF Bioassay, Korea	1 each	GA3001
VEGF Bioassay 5X, Korea	5 each	GA3005
VEGF Bioassay, Taiwan	1 each	GA4001
VEGF Bioassay 5X, Taiwan	5 each	GA4005
Available Separately	**Size**	**Cat.#**
VEGF Bioassay, Propagation Model	1 each	GA1082
Recombinant VEGF	1 each	J2371

Not for Medical Diagnostic Use. All products not available in all countries.

Description: Vascular endothelial growth factor (VEGF) is an important signaling protein that is secreted from epithelial cells, tumor cells and macrophages. It has many functions, including stimulation of angiogenesis, increase of vascular permeability, enhancement of tumor invasion and survival, and inhibition of antitumor response in Treg cells. There are several VEGF receptor subtypes—VEGFR1, VEGFR2 and VEGFR3. VEGFR2 (also known as KDR) mediates almost all known receptor cellular responses to VEGF. VEGF occurs in four isoforms, including VEGF-121, VEGF-165, VEGF-189 and VEGF-206, of which VEGF-121 and -165 are diffusible forms. VEGF-165 is the predominant isoform in the body.

All members of the VEGF family stimulate cellular response by binding to receptors of the receptor tyrosine kinase, namely VEGFR-1 (Flt-1) and VEGFR-2 (Flk-1/KDR). When VEGF binds to KDR, the receptor dimerizes and becomes activated through transphosphorylation.

The VEGF Bioassay is a bioluminescent cell-based assay that measures VEGF stimulation and inhibition of KDR (VEGFR-2) using luciferase as a readout. This assay overcomes many of the limitations of current endothelial cell proliferation assays and can be used for discovery and development of novel biologic therapies aimed at either inducing or inhibiting the VEGF response.

Recombinant VEGF ligand may be used as a positive control in the VEGF Bioassay. Human VEGF-165, amino acids Ala27–Arg191 (Accession# AAM03108), has a predicted molecular mass of 19kDa and is supplied in a solution of 5mM citric acid, 5mM NaHPO4, 0.15M NaCl (pH 4.0) and at a concentration of 200µg/ml.

Features:

- Prequalified according to ICH guidelines
- Mechanism-of-action-based assay
- No primary cell culture required

Note: VEGF Bioassay components are shipped separately because of differing temperature requirements. The KDR/NFAT-RE HEK293 Cells are shipped on dry ice. The Bio-Glo™ Luciferase Assay System and Fetal Bovine Serum are shipped on dry ice, separately from the cells. The DMEM Medium is shipped at ambient temperature.

Storage Conditions:

- Upon arrival, immediately transfer the cell vials to below –140°C (freezer or liquid nitrogen vapor phase) for long-term storage. Do not store cell vials submerged in liquid nitrogen. Do not store cell vials at –80°C because this will negatively impact cell viability and cell performance.
- Store Bio-Glo™ Luciferase Assay Substrate, Bio-Glo™ Luciferase Assay Buffer and Fetal Bovine Serum at –20°C. Avoid multiple freeze-thaw cycles of the serum.
- For optimal performance, use reconstituted Bio-Glo™ Reagent on the day of preparation. However, once reconstituted, Bio-Glo™ Reagent can be stored at –20°C for up to 6 weeks.
- Store DMEM Medium at 4°C protected from light. Minor variations in the color of the DMEM Medium may be observed. The color change will not impact assay performance.

Bio-Glo™ Luciferase Assay System

Product	Size	Cat.#
Bio-Glo™ Luciferase Assay System	100 ml	G7940
	10 ml	G7941

Not For Medical Diagnostic Use.

Description: The Bio-Glo™ Luciferase Assay System provides a highly sensitive, robust, homogeneous reagent for the detection of firefly luciferase reporter gene expression in the ADCC Reporter Bioassay. Bio-Glo™ Luciferase Assay Reagent contains a new luciferase substrate, resulting in a reagent that is more stable and more tolerant to sample components than standard luciferase assay reagents. Bio-Glo™ Luciferase Assay Reagent is functionally tested for performance in the ADCC Reporter Bioassay and is intended for use with this or other bioassays.

Features:

- **Simplified Assay Optimization:** Robust performance, improved storage and convenient size.
- **Room Temperature or 4°C Storage:** Extended stability of the Bio-Glo™ Reagent makes it more convenient for everyday use.
- **Improved Assay Precision:** The Bio-Glo™ Reagent is less sensitive to mixing and dispensing conditions, enhancing reproducibility. Ideal for bioassay applications.
- **Brighter, Longer-Lasting Signal:** Optimized for batch and continuous-process handling, the extended bright light output allows high sensitivity, especially for extended incubations, such as 24 hours.
- **Reduced Unwanted Effects from Sample Components:** The Bio-Glo™ Assay is less sensitive to culture media, phenol red and luciferase inhibitors than other luciferase assays.

Available in the Helix® on-site stocking system

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Fc Effector Activity Bioassays

Mouse ADCC Bioassays

Product	Size	Cat.#
mFcγRIV ADCC Reporter Bioassay, Complete Kit	1 each	M1201
mFcγRIV ADCC Reporter Bioassay, Core Kit	1 each	M1211
mFcγRIV ADCC Reporter Bioassay, Core Kit, 5X	1 each	M1215
mFcγRIV ADCC Reporter Bioassay, Complete Kit, Taiwan	1 each	M1301
mFcγRIV ADCC Reporter Bioassay, Core Kit, Taiwan	1 each	M1302
mFcγRIV ADCC Reporter Bioassay, Core Kit, 5X, Taiwan	1 each	M1305
mFcγRIV ADCC Reporter Bioassay, Complete Kit, Korea	1 each	M1401
mFcγRIV ADCC Reporter Bioassay, Core Kit, Korea	1 each	M1402
mFcγRIV ADCC Reporter Bioassay, Core Kit, 5X, Korea	1 each	M1405
mFcγRIV ADCC Bioassay Effector Cells, Propagation Model	1 each	M1212

Not For Medical Diagnostic Use. All products not available in all countries.

Description: Antibody-dependent cell-mediated cytotoxicity (ADCC) is an important mechanism of action (MOA) of antibodies that target virus-infected or diseased (e.g., tumor) cells for destruction by components of the cell-mediated immune system. Mouse FcγRIV (mFcγRIV) is the predominant receptor involved in ADCC in the mouse and is more closely related to human FcγRIIIa, the primary Fc receptor involved in ADCC in humans, than mFcγRIII.

The mFcγRIV ADCC Reporter Bioassay is a biologically relevant MOA-based assay that can be used to measure the activity of mouse antibodies that specifically bind and activate FcγRIV. Mouse IgG2a, and to a lesser extent IgG2b, are known to mediate ADCC through the activation of mFcγRIV. In contrast, mouse IgG1 does not bind to mFcγIV. The bioassay overcomes the limitations of more labor-intensive and highly variable primary cell assays. The bioassay workflow is simple and robust, compatible with 96-well and 384-well plate formats and, unlike traditional primary cell-based assays, provides a quantitative measure of ADCC with low variability and high accuracy.

mFcγRIV ADCC Bioassay Effector Cells, Propagation Model, allows propagation and banking of the mFcγRIV Effector Cells. Bio-Glo™ Luciferase Assay System is the required reagent for use with mFcγRIV ADCC Bioassay Effector Cells, Propagation Model.

Features:

- **Available in two kit formats:** Complete, with everything you need to get started, and Core, used with customer-defined Ab and target cells.
- Propagation model allows and banking of mFcγRIV ADCC bioassay effector cells.

Storage Conditions: Upon arrival, immediately transfer the cell vials to below –140°C (freezer or liquid nitrogen vapor phase) for long-term storage. Do not store cell vials submerged in liquid nitrogen. Do not store cell vials at –80°C because this will negatively affect cell viability and cell performance.

Bio-Glo™ Luciferase Assay System

Product	Size	Cat.#
Bio-Glo™ Luciferase Assay System	100 ml	G7940
	10 ml	G7941

Not For Medical Diagnostic Use.

Description: The Bio-Glo™ Luciferase Assay System provides a highly sensitive, robust, homogeneous reagent for the detection of firefly luciferase reporter gene expression in the ADCC Reporter Bioassay. Bio-Glo™ Luciferase Assay Reagent contains a new luciferase substrate, resulting in a reagent that is more stable and more tolerant to sample components than standard luciferase assay reagents. Bio-Glo™ Luciferase Assay Reagent is functionally tested for performance in the ADCC Reporter Bioassay and is intended for use with this or other bioassays.

Features:

- **Simplified Assay Optimization:** Robust performance, improved storage and convenient size.
- **Room Temperature or 4°C Storage:** Extended stability of the Bio-Glo™ Reagent makes it more convenient for everyday use.
- **Improved Assay Precision:** The Bio-Glo™ Reagent is less sensitive to mixing and dispensing conditions, enhancing reproducibility. Ideal for bioassay applications.
- **Brighter, Longer-Lasting Signal:** Optimized for batch and continuous-process handling, the extended bright light output allows high sensitivity, especially for extended incubations, such as 24 hours.
- **Reduced Unwanted Effects from Sample Components:** The Bio-Glo™ Assay is less sensitive to culture media, phenol red and luciferase inhibitors than other luciferase assays.

Storage Conditions: Store the Bio-Glo™ Luciferase Assay System components at –30°C to –10°C. The Bio-Glo™ Luciferase Assay Buffer can be stored at below 30°C for up to three months with approximately a 10% change in reagent functionality. For optimal performance, reconstituted Bio-Glo™ Luciferase Assay Reagent should be used the day of preparation. However, once reconstituted, Bio-Glo™ Luciferase Assay Reagent can be stored at –20°C for up to 6 weeks.

ADCP Bioassays

Product	Size	Cat.#
FcγRIIa-H ADCP Reporter Bioassay, Complete Kit	1 each	G9901
FcγRIIa-H ADCP Reporter Bioassay, Complete Kit, Korea	1 each	G9902
FcγRIIa-H ADCP Reporter Bioassay, Complete Kit, Taiwan	1 each	G9903
FcγRIIa-H ADCP Reporter Bioassay, Core Kit	1 each	G9991
FcγRIIa-H ADCP Reporter Bioassay, Core Kit, Korea	1 each	G9992
FcγRIIa-H ADCP Reporter Bioassay, Core Kit, Taiwan	1 each	G9993
FcγRIIa-H ADCP Reporter Bioassay, Core Kit 5X	1 each	G9995
FcγRIIa-H ADCP Reporter Bioassay, Core Kit 5X, Korea	1 each	G9996
FcγRIIa-H ADCP Reporter Bioassay, Core Kit 5X, Taiwan	1 each	G9997
FcγRIIa-H ADCP Bioassay Effector Cells, Propagation Model	1 each	G9871

Not For Medical Diagnostic Use. All products not available in all countries.

Description: Antibody-dependent cell-mediated phagocytosis (ADCP) is an important mechanism of action (MOA) of therapeutic antibodies. In vivo, ADCP can be mediated by monocytes, macrophages, neutrophils and dendritic cells via FcγRIIa, FcγRI and FcγRIIIa. While all three receptors can participate in ADCP, FcγRIIa is believed to be the predominant Fcγ receptor involved in this process.

The FcγRIIa-H ADCP Reporter Bioassay is a biologically relevant MOA-based assay that can be used to measure the potency and stability of antibodies and other biologics that specifically bind and activate FcγRIIa. The assay consists of Jurkat cells stably expressing human FcγRIIa-H (the high-affinity H131 variant) and NFAT-induced luciferase.

The bioassay is prequalified according to ICH guidelines and shows the precision, accuracy and linearity required for routine use in potency and stability studies. The bioassay workflow is simple and robust, compatible with 96-well and 384-well plate formats, and unlike traditional primary cell-based assays, amenable for use in quality-controlled drug development settings.

Product Kit Formats
The FcγRIIa-H ADCP Reporter Bioassay is available in multiple product kit formats:

Complete Kit

- Includes FcγRIIa-H Effector Cells, Target Cells (Raji), Control Antibody, Cell Culture Medium and Assay Reagents.
- Recommended for use as a starter kit.

Core Kits

- Include FcγRIIa-H Effector Cells, Cell Culture Medium and Assay Reagents.
- Recommended for routine use with customer-defined antibody and target cells.
- Available in 1X and 5X sizes.

Note: The FcγRIIa-H ADCP Reporter Bioassay components are shipped separately because of temperature requirements. The FcγRIIa-H Effector Cells and Target Cells (Raji) are shipped on dry ice. The Bio-Glo™ Luciferase Assay System, Low IgG Serum and ADCP Control Ab, Anti-CD20, are shipped on dry ice, separately from the cells. The RPMI 1640 Medium is shipped at ambient temperature.

Storage Conditions: Upon arrival, immediately transfer the cell vials to below –140°C (freezer or liquid nitrogen vapor phase) for long-term storage. Do not store cell vials submerged in liquid nitrogen. Do not store cell vials at –80°C because this will negatively affect cell viability and cell performance. ADCP Control Ab, Anti-CD20, Bio-Glo™ Luciferase Assay Substrate, Bio-Glo™ Luciferase Assay Buffer and Low IgG Serum should be stored at –20°C. Avoid multiple freeze-thaw cycles of the serum. For optimal performance, reconstituted Bio-Glo™ Reagent should only be used on the day of preparation. However, once reconstituted, Bio-Glo™ Reagent can be stored at –20°C for up to 6 weeks. RPMI 1640 Medium should be stored at 4°C protected from fluorescent light.

Available in the Helix® on-site stocking system

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ADCC Bioassays

Product	Size	Cat.#
ADCC Reporter Bioassay, Complete (Raji)	1 each	G7015
ADCC Reporter Bioassay, Complete (WIL2-S)	1 each	G7014
ADCC Reporter Bioassay, Core Kit	1 each	G7010
ADCC Reporter Bioassay, Target (Raji)	1 each	G7016
ADCC Reporter Bioassay, Target (WIL2-S)	1 each	G7013
ADCC Reporter Bioassay, Core Kit 5X	1 each	G7018
ADCC Bioassay Effector Cells, Propagation Model	1 each	G7102
ADCC Reporter Bioassay, F Variant, Core Kit	1 each	G9790
ADCC Reporter Bioassay, F Variant, Core Kit 5X	1 each	G9798
ADCC Bioassay Effector Cells, F Variant, Propagation Model	1 each	G9302

G7015, G7014, G7010, G7016, G7013, G7018 For Research Use Only. Not for Use in Diagnostic Procedures. G7102, G9790, G9798, G9302 Not For Medical Diagnostic Use. All products not available in all countries.

Description: Fc receptor-mediated antibody-dependent cell-mediated cytotoxicity (ADCC) is an important mechanism of action (MOA) by which antibodies target disease cells for elimination. Classic methods used to measure ADCC use primary donor peripheral blood mononuclear cells (PBMCs) or purified natural killer (NK) cells that express Fc receptors on their cell surface. After engaging the Fc region of a relevant antibody bound to a target disease cell, Fc receptors transduce intracellular signals within the effector cell, resulting in elimination of the target cell. These primary cell-based assays are highly variable as a result of donor differences and the requirement for cell culture and expansion.

The ADCC Reporter Bioassay provides a biologically relevant and specific MOA-based measure of ADCC without the complex workflow and variability inherent in primary cell-based assays. Specifically, primary donor PBMC or NK cells are replaced with a Jurkat cell stably expressing human FcγRIIIa (either the high-affinity V158 or low-affinity F158 receptor) and NFAT-induced luciferase. Importantly, the ADCC Reporter Bioassay demonstrates antibody activity ranking equivalent to classic LDH release ADCC bioassays. The bioassay also can be used to quantify effects of antibody glycosylation on Fc effector function.

Product Kit Formats

The ADCC Reporter Bioassay is available in multiple product kit formats:

Complete Kits

- Include ADCC Bioassay Effector Cells, Target Cells, Control Antibody, Cell Culture Medium and Assay Reagents.
- Recommended for use as a starter kit.
- Available with either Raji or WIL2-S Target Cells.

Core Kits

- Include ADCC Bioassay Effector Cells, Cell Culture Medium and Assay Reagents.
- Recommended for routine use with customer-defined antibody and target cells.
- Available in 1X and 5X sizes.

Target Kits

- Include ADCC Bioassay Target Cells and Control Antibody.
- Recommended for use as a control with all Fc Effector Bioassay Core Kits.
- Available with either Raji or WIL2-S Target Cells.

Storage Conditions: The ADCC Reporter Bioassay components are shipped separately because of temperature requirements. The ADCC Bioassay Effector Cells and Target Cells are shipped on dry ice. The Bio-Glo™ Luciferase Assay System and Low IgG Serum are shipped on dry ice, separately from the cells. The RPMI 1640 Medium is shipped at ambient temperature. The Control Ab, Anti-CD20, is shipped on gel ice. Upon arrival, immediately transfer the vials of ADCC Bioassay Effector Cells and Target Cells for long-term storage below –140°C (freezer or liquid nitrogen vapor phase). The cells are sensitive, and care should be taken when handling. For safety reasons, do not store cell vials submerged in liquid nitrogen. Store the Low IgG Serum at –20°C. Avoid multiple freeze-thaw cycles. Store the Control Ab, Anti-CD20, at 4°C. Store the Bio-Glo™ Luciferase Assay Buffer and Luciferase Assay Substrate at –20°C. For optimal performance, use reconstituted Bio-Glo™ Luciferase Assay Reagent on the day of preparation. However, once reconstituted, you can store Bio-Glo™ Luciferase Assay Reagent at –20°C for up to 6 weeks. Store RPMI 1640 Medium at 4°C protected from fluorescent light.

Immune Checkpoint Bioassays

LAG-3/MHCII Blockade Bioassay

Product	Size	Cat.#
LAG-3/MHCII Blockade Bioassay	1 each	JA1111
LAG-3/MHCII Blockade Bioassay 5X	5 each	JA1115
LAG-3/MHCII Blockade Bioassay, Korea	1 each	JA2111
LAG-3/MHCII Blockade Bioassay 5X, Korea	5 each	JA2115
LAG-3/MHCII Blockade Bioassay, Taiwan	1 each	JA3111
LAG-3/MHCII Blockade Bioassay 5X, Taiwan	5 each	JA3115
Available Separately		
LAG-3/MHCII Blockade Bioassay, Propagation Model	1 each	JA1112
Control Ab, Anti-LAG-3	100µg	K1150
TCR Activating Antigen Stock Solution	500µl	K1201
Not For Medical Diagnostic Use. All products not available in all countries.		

Description: The LAG-3/MHCII Blockade Bioassay is a bioluminescent cell-based assay that measures potency and stability of antibodies and other biologics designed to block the interaction of LAG-3 with its best characterized ligand, major histocompatibility complex II (MHCII). LAG-3, also known as CD223, is an immune checkpoint receptor expressed on activated CD4+ and CD8+ T cells and natural killer (NK) cells. LAG-3 plays a critical role in regulating immune responses to tumor antigens and autoantigens. Engagement of LAG-3 by MHCII inhibits TCR signaling, cytokine production and proliferation of activated T cells. Therapeutic antibodies designed to block the LAG-3/MHCII interaction show promising results in clinical trials for the treatment of a variety of cancers.

The LAG-3/MHCII Blockade Bioassay reflects the mechanism of action (MOA) of biologics designed to block the interaction of LAG-3 with its ligand, MHCII.

The LAG-3/MHCII Blockade Bioassay, Propagation Model, overcomes the limitations of existing assays. The LAG-3 Effector Cells and MHCII APC Cells are provided in a Cell Propagation Model (CPM) format, which includes cryopreserved cells that can be thawed, propagated and banked for long-term use.

Features:

- Prequalified according to ICH guidelines
- 96- and 384-well plate formats
- No primary cell culture required

Note: The LAG-3/MHCII Blockade Bioassay components are shipped separately due to differing temperature requirements. The LAG-3 Effector Cells and MHCII APC Cells are shipped on dry ice. The TCR Activating Antigen, Bio-Glo™ Luciferase Assay System and Fetal Bovine Serum are shipped on dry ice, separately from the cells. The RPMI 1640 Medium and DMEM Medium are shipped at ambient temperature.

Storage Conditions:

- Upon arrival, immediately transfer the cell vials to below –140°C (freezer or liquid nitrogen vapor phase) for long-term storage. Do not store cell vials submerged in liquid nitrogen. Do not store cell vials at –80°C because this will negatively impact cell viability and cell performance.
- Store TCR Activating Antigen, Bio-Glo™ Luciferase Assay Substrate, Bio-Glo™ Luciferase Assay Buffer, Bio-Glo™ Luciferase Assay Buffer and Fetal Bovine Serum at –20°C. Avoid multiple freeze-thaw cycles of the antigen and serum.
- For optimal performance, use reconstituted Bio-Glo™ Reagent on the day of preparation. However, once reconstituted, Bio-Glo™ Reagent can be stored at –20°C for up to 6 weeks.
- Store RPMI 1640 Medium and DMEM Medium at 4°C protected from fluorescent light.

4-1BB Bioassay

Product	Size	Cat.#
4-1BB Bioassay	1 each	JA2351
4-1BB Bioassay 5X	5 each	JA2355
4-1BB Bioassay, Korea	1 each	JA3351
4-1BB Bioassay 5X, Korea	5 each	JA3355
4-1BB Bioassay, Taiwan	1 each	JA4411
4-1BB Bioassay 5X, Taiwan	5 each	JA4415
Available Separately		
4-1BB Bioassay, Propagation Model	1 each	J2332
FcγRIIb CHO-K1 Cells	1 each	JA2251
FcγRIIb CHO-K1 Cells 5X	5 each	JA2255
FcγRIIb CHO-K1 Cells, Propagation Model	1 each	J2232
Control Antibody, Anti-4-1BB	50µg	K1161
Not For Medical Diagnostic Use. All products not available in all countries.		

Description: 4-1BB (CD137/TNFRSF9), a member of the tumor necrosis factor receptor superfamily, is an inducible co-stimulatory receptor expressed on T cells, NK cells and innate immune cell populations. When present on the cell surface, 4-1BB interacts with 4-1BB ligand (4-1BBL) and induces subsequent cell proliferation and production of interferon gamma (IFNγ) and IL-2, particularly in T and NK cells.

Current methods used to measure the activity of biologic drugs targeting 4-1BB rely on primary human T cells and measurement of functional endpoints such as cell proliferation, cell surface marker expression, and IFNγ and interleukin-2 (IL-2) production. These assays are laborious and highly variable due to their reliance on donor primary cells, complex assay protocols and unqualified assay reagents. As a result, these assays are difficult to establish in a quality-controlled, drug-development setting.

The 4-1BB Bioassay is a bioluminescent cell-based assay that overcomes the limitations of existing assays and can be used to measure the potency and stability of ligands or agonist antibodies that can bind and activate 4-1BB. The assay consists of a genetically engineered Jurkat T cell line that expresses human 4-1BB and a luciferase reporter driven by a response element that can respond to 4-1BB ligand/agonist antibody stimulation. The 4-1BB Effector Cells are provided in thaw-and-use format as cryopreserved cells that can be thawed, plated and used in an assay without the need for cell culture and propagation. The 4-1BB Bioassay is also available in a Cell Propagation Model (CPM) format, which includes cryopreserved cells that can be thawed, propagated and banked for long-term use.

Features:

- Prequalified according to ICH guidelines
- Mechanism-of-action-based assay
- No primary cell culture required

Note: The 4-1BB Bioassay components are shipped separately because of different temperature requirements. The 4-1BB Effector Cells are shipped on dry ice. The Bio-Glo™ Luciferase Assay Substrate and Buffer and Fetal Bovine Serum are shipped on dry ice, separately from the cells. The RPMI 1640 Medium is shipped at ambient temperature.

Storage Conditions:

- Upon arrival, immediately transfer the cell vials to below –140°C (freezer or liquid nitrogen vapor phase) for long-term storage. Do not store cell vials submerged in liquid nitrogen. Do not store cell vials at –80°C because this will decrease cell viability and cell performance.
- Store Bio-Glo™ Luciferase Assay Substrate, Bio-Glo™ Luciferase Assay Buffer and Fetal Bovine Serum at –20°C. Avoid multiple freeze-thaw cycles of the serum.
- For optimal performance, use reconstituted Bio-Glo™ Reagent on the day of preparation. However, once reconstituted, Bio-Glo™ Reagent can be stored at –20°C for up to 6 weeks.
- Store RPMI 1640 Medium at 4°C protected from fluorescent light.

Available in the Helix® on-site stocking system

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PD-1 + TIGIT Combination Bioassay

Product	Size	Cat.#
PD-1 + TIGIT Combination Bioassay	1 each	J2211
PD-1 + TIGIT Combination Bioassay 5X	5 each	J2215
PD-1 + TIGIT Combination Bioassay, Korea	1 each	J2311
PD-1 + TIGIT Combination Bioassay 5X, Korea	5 each	J2315
PD-1 + TIGIT Combination Bioassay, Taiwan	1 each	J2411
PD-1 + TIGIT Combination Bioassay 5X, Taiwan	5 each	J2415
Available Separately	**Size**	**Cat.#**
PD-1 + TIGIT Combination Bioassay, Propagation Model	1 each	J2102
Control Antibody, Anti-TIGIT	100µg	J2051

Not for Medical Diagnostic Use. All products not available in all countries.

Description: PD-1 and TIGIT are both immune inhibitory receptors that are expressed on T cells. Engagement of PD-1 by PD-L1 on an adjacent cell inhibits TCR signaling and TCR-mediated proliferation, transcriptional activation and cytokine production. The ligand for TIGIT is CD155. TIGIT negatively regulates NK cell killing and T cell activation by competing with CD226 for binding to CD155 and by directly interfering with CD226 homodimerization.

Preclinical cancer studies suggest that targeted therapies that simultaneously block PD-1 and TIGIT are superior to those that block either pathway alone. The PD-1+TIGIT Combination Bioassay reflects the mechanism of action (MOA) of biologics designed to block the PD-1/PD-L1 and TIGIT/CD155 interactions.

The PD-1 + TIGIT Combination Bioassay, Propagation Model, is a bioluminescent cell-based assay that overcomes the limitations of existing assays and can be used to measure the potency and stability of antibodies and other biologics targeting PD-1 and TIGIT. The assay consists of two genetically engineered cell lines:

- **PD-1 + TIGIT Effector Cells:** Jurkat T cells engineered to express human PD-1 and human TIGIT with a luciferase reporter driven by a native promoter that can respond to both TCR activation and CD226 co-stimulation
- **PD-L1 + CD155 aAPC/CHO-K1 Cells:** CHO-K1 cells engineered to express human PD-L1 and human CD155 with an engineered cell-surface protein designed to activate the T cell receptor (TCR) complex in an antigen-independent manner

The PD-1 + TIGIT Effector Cells and PD-L1+CD155 aAPC/CHO-K1 Cells are provided in Cell Propagation Model (CPM) format, which includes cryopreserved cells that can be thawed, propagated and banked for long-term use.

Features:

- Prequalified according to ICH guidelines
- 96- and 384-well plate formats
- No primary cell culture required

Note: The PD-1 + TIGIT Combination Bioassay components are shipped separately because of differing temperature requirements. The PD-1+TIGIT Effector Cells and PD-L1+CD155 aAPC/CHO-K1 Cells are shipped on dry ice. The Bio-Glo™ Luciferase Assay Substrate and Buffer and Fetal Bovine Serum are shipped on dry ice, separately from the cells. The RPMI 1640 Medium and Ham's F-12 Medium are shipped at ambient temperature.

Storage Conditions:

- Upon arrival, immediately transfer the cell vials to below –140°C (freezer or liquid nitrogen vapor phase) for long-term storage. Do not store cell vials submerged in liquid nitrogen. Do not store cell vials at –80°C because this will negatively impact cell viability and cell performance.
- Store Bio-Glo™ Luciferase Assay Substrate, Bio-Glo™ Luciferase Assay Buffer and Fetal Bovine Serum at –20°C. Avoid multiple freeze-thaw cycles of the serum.
- For optimal performance, use reconstituted Bio-Glo™ Reagent on the day of preparation. However, once reconstituted, Bio-Glo™ Reagent can be stored at –20°C for up to 6 weeks.
- Store RPMI 1640 Medium and Ham's F-12 Medium at 4°C, protected from fluorescent light.

CTLA-4 Blockade Bioassay

Product	Size	Cat.#
CTLA-4 Blockade Bioassay	1 each	JA3001
CTLA-4 Blockade Bioassay 5X	5 each	JA3005
CTLA-4 Blockade Bioassay, Korea	1 each	JA4001
CTLA-4 Blockade Bioassay 5X, Korea	5 each	JA4005
CTLA-4 Blockade Bioassay, Taiwan	1 each	JA5001
CTLA-4 Blockade Bioassay 5X, Taiwan	5 each	JA5005
Available Separately	**Size**	**Cat.#**
CTLA-4 Blockade Bioassay, Propagation Model	1 each	JA1400
Control Antibody, Anti-CTLA-4	100µg	JA1020

Not for Medical Diagnostic Use. All products not available in all countries.

Description: CTLA-4, also known as CD152, is an immune inhibitory receptor constitutively expressed on regulatory T cells (Tregs) and upregulated in activated T cells. CTLA-4 plays a critical role in regulating immune responses to tumor antigens and autoantigens. When CTLA-4 expression is upregulated on the surface of
T cells, the T cells bind B7 with a higher avidity, and thus outcompete the positive co-stimulatory signal from CD28. In addition, engagement of CTLA-4 by either of its ligands, CD80 (B7-1) or CD86 (B7-2) on an adjacent antigen presenting cell (APC) inhibits CD28 co-stimulation of T cell activation, cell proliferation and cytokine production.

The CTLA-4 Blockade Bioassay reflects the mechanism of action (MOA) of biologics designed to block the interaction of CTLA-4 with its ligands, CD80 and CD86.

CTLA-4 Blockade Bioassay, Propagation Model, allows propagation and banking of the CTLA-4 Effector Cells. Bio-Glo™ Luciferase Assay System (Cat.# G7940, G7941) is the required reagent for use with CTLA-4 Blockade Bioassay, Propagation Model.

Features:

- Prequalified according to ICH guidelines
- 96- and 384-well plate formats
- No primary cell culture required

Note: The CTLA-4 Blockade Bioassay components are shipped separately because of differing temperature requirements. The CTLA-4 Effector Cells and aAPC/Raji Cells are shipped on dry ice. The Bio-Glo™ Luciferase Assay System and Fetal Bovine Serum are shipped on dry ice, separately from the cells. The RPMI 1640 Medium is shipped at ambient temperature.

Storage Conditions:

- Upon arrival, immediately transfer the cell vials to below –140°C (freezer or liquid nitrogen vapor phase) for long-term storage. Do not store cell vials submerged in liquid nitrogen. Do not store cell vials at –80°C because this will negatively impact cell viability and cell performance.
- Store Bio-Glo™ Luciferase Assay Substrate, Bio-Glo™ Luciferase Assay Buffer and Fetal Bovine Serum at –20°C. Avoid multiple freeze-thaw cycles of the serum.
- For optimal performance, use reconstituted Bio-Glo™ Reagent on the day of preparation. However, once reconstituted, Bio-Glo™ Reagent can be stored at –20°C for up to 6 weeks.
- Store RPMI 1640 Medium at 4°C, protected from fluorescent light.

TIGIT/CD155 Blockade Bioassay

Product	Size	Cat.#
TIGIT/CD155 Blockade Bioassay	1 each	J2201
TIGIT/CD155 Blockade Bioassay 5X	5 each	J2205
TIGIT/CD155 Blockade Bioassay, Korea	1 each	J2301
TIGIT/CD155 Blockade Bioassay 5X, Korea	5 each	J2305
TIGIT/CD155 Blockade Bioassay, Taiwan	1 each	J2401
TIGIT/CD155 Blockade Bioassay 5X, Taiwan	5 each	J2405
Available Separately	**Size**	**Cat.#**
TIGIT/CD155 Blockade Bioassay, Propagation Model	1 each	J2092
Control Antibody, Anti-TIGIT	100µg	J2051

Not for Medical Diagnostic Use. All products not available in all countries.

Description: TIGIT, also known as WUCAM and Vstm3, is an immune checkpoint protein expressed on lymphocytes. Highest expression levels are observed on effector CD4+ and CD8+ T cells, regulatory T cells, and NK cells. TIGIT has several distinct mechanisms of action that inhibit lymphocyte activation. First, TIGIT is an inhibitory counterpart of the co-stimulatory receptor CD226. When TIGIT is present on the surface of lymphocytes, it outcompetes CD226 for CD155 binding and thus negates CD226 signaling. Second, TIGIT inhibits CD226 homodimerization in cis, preventing CD226 signaling. Third, the cytoplasmic tail of TIGIT contains an immunoreceptor tyrosine-based inhibitory motif (ITIM), which could potentially lead to inhibitory signaling.

The TIGIT/CD155 Blockade Bioassay reflects the mechanism of action (MOA) of biologics designed to block the TIGIT/CD155 interaction.

The TIGIT/CD155 Blockade Bioassay, Propagation Model, allows propagation and banking of the TIGIT Effector Cells as well as the CD155 aAPC/CHO-K1 Cells. Bio-Glo™ Luciferase Assay System (Cat.# G7940, G7941) is the required reagent for use with TIGIT/CD155 Blockade Bioassay, Propagation Model.

Features:

- Prequalified according to ICH guidelines
- 96- and 384-well plate formats
- No primary cell culture required

Note: The TIGIT/CD155 Blockade Bioassay components are shipped separately because of differing temperature requirements. The TIGIT Effector Cells and CD155 aAPC/CHO-K1 Cells are shipped on dry ice. The Bio-Glo™ Luciferase Assay Substrate and Buffer and Fetal Bovine Serum are shipped on dry ice, separately from the cells. The RPMI 1640 Medium is shipped at ambient temperature.

Storage Conditions:

- Upon arrival, immediately transfer the cell vials to below –140°C (freezer or liquid nitrogen vapor phase) for long-term storage. Do not store cell vials submerged in liquid nitrogen. Do not store cell vials at –80°C because this will decrease cell viability and cell performance.
- Store Bio-Glo™ Luciferase Assay Substrate, Bio-Glo™ Luciferase Assay Buffer and Fetal Bovine Serum at –20°C. Avoid multiple freeze-thaw cycles of the serum.
- For optimal performance, use reconstituted Bio-Glo™ Reagent on the day of preparation. However, once reconstituted, Bio-Glo™ Reagent can be stored at –20°C for up to 6 weeks.
- Store RPMI 1640 Medium at 4°C protected from fluorescent light.

Available in the Helix® on-site stocking system

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PD-1/PD-L1 Blockade Bioassays

Product	Size	Cat.#
PD-1/PD-L1 Blockade Bioassay	1 each	J1250
PD-1/PD-L1 Blockade Bioassay, Propagation Model	1 each	J1252
PD-1/PD-L1 Blockade Bioassay 5X	1 each	J1255
Available Separately	**Size**	**Cat.#**
PD-L1 Negative Cells	1 each	J1191
PD-L1 Negative Cells 5X	1 each	J1195
Control Ab, Anti-PD-1	1 each	J1201

Not For Medical Diagnostic Use. All products not available in all countries.

Description: PD-1 is an immune inhibitory receptor expressed on activated T cells and B cells and plays a critical role in regulating immune responses to tumor antigens and autoantigens. Engagement of PD-1 by either of its ligands, PD-L1 or PD-L2, on an adjacent cell inhibits TCR signaling and TCR-mediated proliferation, transcriptional activation and cytokine production. Therapeutic antibodies and Fc fusion proteins designed to block the PD-1/PD-L1 interaction show promising results in clinical trials for the treatment of a variety of cancers.

The PD-1/PD-L1 Blockade Bioassay is a biologically relevant MOA-based assay that can be used to measure the potency and stability of antibodies and other biologics designed to block the PD-1/PD-L1 interaction. The assay consists of two genetically engineered cell lines:

- PD-1 Effector Cells: Jurkat T cells stably expressing human PD-1 and NFAT-induced luciferase.
- PD-L1 aAPC/CHO-K1 Cells: CHO-K1 cells stably expressing human PD-L1 and a cell surface protein designed to activate cognate TCRs in an antigen-independent manner.

When the two cell types are co-cultured, the PD-1/PD-L1 interaction inhibits TCR signaling and NFAT-mediated luciferase activity. Addition of an antibody that blocks either PD-1 or PD-L1 releases the inhibitory signal and results in TCR signaling and NFAT-mediated luciferase activity.

Product Kit Formats and Related Products

- Kits are available in 1X and 5X sizes.
- Control Ab, Anti-PD-1 is available separately.
- PD-L1 Negative Cells are available separately.

Features:

- **Use a Bioassay Prequalified According to ICH Guidelines:** The bioassays demonstrate the precision, accuracy and linearity required for routine use in potency and stability studies.
- **Employ Simple and Robust Workflow:** Easy to implement with no specialized skills or training required.
- **Run the Bioassay in 96-Well and 384-Well Plate Format:** Amenable for antibody screening and drug discovery.
- **Choose Multiple Product Formats:** Flexibility to meet your experimental and workflow needs.

Note: The PD-1/PD-L1 Blockade Bioassay components are shipped separately because of temperature requirements. The PD-1 Effector Cells and PD-L1 aAPC/CHO-K1 Cells are shipped on dry ice. The Bio-Glo™ Luciferase Assay System and Fetal Bovine Serum are shipped on dry ice, separately from the cells. The RPMI 1640 Medium and Ham's F12 Medium are shipped at ambient temperature.

Storage Conditions: Upon arrival, immediately transfer the cell vials to below –140°C (freezer or liquid nitrogen vapor phase) for long-term storage. Do not store cell vials submerged in liquid nitrogen. Do not store cell vials at –80°C because this will negatively impact cell viability and cell performance. Store Bio-Glo™ Luciferase Assay Substrate, Bio-Glo™ Luciferase Assay Buffer and Fetal Bovine Serum at –20°C. Avoid multiple freeze-thaw cycles of the serum. For optimal performance, use reconstituted Bio-Glo™ Reagent on the day of preparation. However, once reconstituted, Bio-Glo™ Reagent can be stored at –20°C for up to 6 weeks. Store RPMI 1640 Medium at 4°C protected from fluorescent light.

Bio-Glo™ Luciferase Assay System

Product	Size	Cat.#
Bio-Glo™ Luciferase Assay System	100 ml	G7940
	10 ml	G7941

Not For Medical Diagnostic Use.

Description: The Bio-Glo™ Luciferase Assay System provides a highly sensitive, robust, homogeneous reagent for the detection of firefly luciferase reporter gene expression in the ADCC Reporter Bioassay. Bio-Glo™ Luciferase Assay Reagent contains a new luciferase substrate, resulting in a reagent that is more stable and more tolerant to sample components than standard luciferase assay reagents. Bio-Glo™ Luciferase Assay Reagent is functionally tested for performance in the ADCC Reporter Bioassay and is intended for use with this or other bioassays.

Features:

- **Simplified Assay Optimization:** Robust performance, improved storage and convenient size.
- **Room Temperature or 4°C Storage:** Extended stability of the Bio-Glo™ Reagent makes it more convenient for everyday use.
- **Improved Assay Precision:** The Bio-Glo™ Reagent is less sensitive to mixing and dispensing conditions, enhancing reproducibility. Ideal for bioassay applications.
- **Brighter, Longer-Lasting Signal:** Optimized for batch and continuous-process handling, the extended bright light output allows high sensitivity, especially for extended incubations, such as 24 hours.
- **Reduced Unwanted Effects from Sample Components:** The Bio-Glo™ Assay is less sensitive to culture media, phenol red and luciferase inhibitors than other luciferase assays.

Storage Conditions: Store the Bio-Glo™ Luciferase Assay System components at –30°C to –10°C. The Bio-Glo™ Luciferase Assay Buffer can be stored at below 30°C for up to three months with approximately a 10% change in reagent functionality. For optimal performance, reconstituted Bio-Glo™ Luciferase Assay Reagent should be used the day of preparation. However, once reconstituted, Bio-Glo™ Luciferase Assay Reagent can be stored at –20°C for up to 6 weeks.

T Cell Activation Bioassays

T Cell Activation Bioassays

Product	Size	Cat.#
T Cell Activation Bioassay (NFAT)	1 each	J1621
T Cell Activation Bioassay (NFAT) 5X	5 each	J1625
T Cell Activation Bioassay (IL-2)	1 each	J1651
T Cell Activation Bioassay (IL-2) 5X	5 each	J1655
T Cell Activation Bioassay (NFAT), Korea	1 each	J1622
T Cell Activation Bioassay (NFAT) 5X, Korea	5 each	J1626
T Cell Activation Bioassay (IL-2), Korea	1 each	J1652
T Cell Activation Bioassay (IL-2) 5X, Korea	5 each	J1656
T Cell Activation Bioassay (NFAT), Taiwan	1 each	J1623
T Cell Activation Bioassay (NFAT) 5X, Taiwan	5 each	J1627
T Cell Activation Bioassay (IL-2), Taiwan	1 each	J1653
T Cell Activation Bioassay (IL-2) 5X, Taiwan	5 each	J1657
T Cell Activation Bioassay (NFAT), Propagation Model	1 each	J1601
T Cell Activation Bioassay (IL-2), Propagation Model	1 each	J1631

Not For Medical Diagnostic Use. All products not available in all countries.

Description: The T Cell Activation Bioassays consist of a genetically engineered Jurkat T cell line that expresses a luciferase reporter (TCR/CD3 Effector Cells) driven by either an NFAT-response element (NFAT-RE) or an IL-2 promoter. When the TCR/CD3 Effector Cells (NFAT) are engaged with an appropriate TCR/CD3 ligand or anti-TCR/CD3 antibody, the TCR transduces intracellular signals resulting in NFAT-RE-mediated luminescence. Similarly, when the TCR/CD3 Effector Cells (IL-2) are co-engaged with an anti-TCR/CD3 and an anti-CD28 stimulus, receptor-mediated signaling results in IL-2 promoter-mediated luminescence.

The bioassay is prequalified according to ICH guidelines and shows the precision, accuracy and linearity required for routine use in potency and stability studies. The bioassay workflow is simple, robust and compatible with 96-well and 384-well plate formats used for antibody screening and drug discovery. Additionally, the bioassay is tolerant to human serum, indicating potential for further development into a neutralizing antibody bioassay.

T Cell Activation Bioassay, Propagation Model, allows propagation and banking of the TCR/CD3 Effector Cells. Bio-Glo™ Luciferase Assay System (Cat.# G7940, G7941) is the required reagent for use with T Cell Activation Bioassay, Propagation Model.

Features:

- Prequalified according to ICH guidelines.
- Amenable to high-throughput formats.
- No cell culture required.
- Propagation model allows and banking of TCR/CD3 effector cells for use in T Cell Activation Bioassay.

Storage Conditions: Upon arrival, immediately transfer the cell vials to below –140°C (freezer or liquid nitrogen vapor phase) for long-term storage. Do not store cell vials submerged in liquid nitrogen. Do not store cell vials at –80°C as this will decrease cell viability and cell performance.

Bio-Glo™ Luciferase Assay System

Product	Size	Cat.#
Bio-Glo™ Luciferase Assay System	100 ml	G7940
	10 ml	G7941

Not For Medical Diagnostic Use.

Description: The Bio-Glo™ Luciferase Assay System provides a highly sensitive, robust, homogeneous reagent for the detection of firefly luciferase reporter gene expression in the ADCC Reporter Bioassay. Bio-Glo™ Luciferase Assay Reagent contains a new luciferase substrate, resulting in a reagent that is more stable and more tolerant to sample components than standard luciferase assay reagents. Bio-Glo™ Luciferase Assay Reagent is functionally tested for performance in the ADCC Reporter Bioassay and is intended for use with this or other bioassays.

Features:

- **Simplified Assay Optimization:** Robust performance, improved storage and convenient size.
- **Room Temperature or 4°C Storage:** Extended stability of the Bio-Glo™ Reagent makes it more convenient for everyday use.
- **Improved Assay Precision:** The Bio-Glo™ Reagent is less sensitive to mixing and dispensing conditions, enhancing reproducibility. Ideal for bioassay applications.
- **Brighter, Longer-Lasting Signal:** Optimized for batch and continuous-process handling, the extended bright light output allows high sensitivity, especially for extended incubations, such as 24 hours.
- **Reduced Unwanted Effects from Sample Components:** The Bio-Glo™ Assay is less sensitive to culture media, phenol red and luciferase inhibitors than other luciferase assays.

Storage Conditions: Store the Bio-Glo™ Luciferase Assay System components at –30°C to –10°C. The Bio-Glo™ Luciferase Assay Buffer can be stored at below 30°C for up to three months with approximately a 10% change in reagent functionality. For optimal performance, reconstituted Bio-Glo™ Luciferase Assay Reagent should be used the day of preparation. However, once reconstituted, Bio-Glo™ Luciferase Assay Reagent can be stored at –20°C for up to 6 weeks.

Available in the Helix® on-site stocking system

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Antibody Characterization

rAsp-N, Mass Spec Grade

Product	Size	Cat.#
rAsp-N, Mass Spec Grade	10µg	VA1160
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: rAsp-N, Mass Spec Grade, is a recombinant protease that was cloned from *Stenotrophomonas maltophilia* and purified from *E. coli*. rAsp-N is a highly active protease suitable for proteomic analysis of complex mixtures as well as peptide mapping of purified proteins, such as therapeutic monoclonal antibodies. The protease is provided in 10µg aliquots in a conical vial for easy and consistent resuspension.

Features:

- Less expensive alternative to native Asp-N
- Larger volume (5X more protease) for more consistent resuspension
- Use in complex proteomic analyses and peptide mapping of purified proteins

Storage Conditions: Store the lyophilized product at –30°C to –10°C.

Lys-C, Mass Spec Grade, and Lys-N, Mass Spec Grade

Product	Size	Cat.#
Lys-C, Mass Spec Grade	20µg	VA1170
Lys-N, Mass Spec Grade	20µg	VA1180
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Endoproteinase Lys-C, Mass Spec Grade, is a highly-purified serine protease that hydrolyzes specifically at the carboxyl side of lysines. Lys-C retains proteolytic activity under strong protein denaturing conditions such as 8M urea, which can be used to improve digestion of proteolytically resistant proteins. Lys-C, Mass Spec Grade, has optimal activity in the range of pH 7.0–9.0. This protease can be used alone or in combination with other proteases to produce protein digests for peptide mapping applications or protein identification by peptide mass fingerprinting or MS/MS spectral matching.

Endoproteinase Lys-N, Mass Spec Grade, is a zinc metalloprotease that cleaves at the amino side of lysines. Lys-N, Mass Spec Grade, retains proteolytic activity under strong protein denaturing conditions such as 8M urea, which can be used to improve digestion of proteolytically resistant proteins. Charged amino-terminal peptide fragments generated by Lys-N, Mass Spec Grade, are useful for de novo sequencing with ETD fragmentation techniques.

Features:

- Active under strong denaturing conditions
- Choice of N-terminal (Lys-N) or C-terminal (Lys-C) lysine cleavage
- Generates longer peptides than with tryptic digests

Storage Conditions: Store the lyophilized product at –30°C to –10°C.

AccuMAP™ Low pH Protein Digestion Kit

Product	Size	Cat.#
AccuMAP™ Low pH Protein Digestion Mini Kit	1 each	VA1040
AccuMAP™ Low pH Protein Digestion Maxi Kit	1 each	VA1050
Available Separately		
AccuMAP™ Denaturing Solution	1ml	VA1000
AccuMAP™ 10X Low pH Reaction Buffer	1ml	VA1010
AccuMAP™ 100X Oxidation Suppressant	50µl	VA1020
AccuMAP™ Low pH Resistant rLys-C Solution	120µl	VA1030
TCEP	15mg	VB1000
Iodoacetamide	15mg	VB1010
AccuMAP™ Modified Trypsin Solution	120µl	V5285

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The AccuMap™ Low pH Protein Digestion Kit is designed for accurate, reproducible characterization of biotherapeutic proteins by peptide mapping using LC/MS or UV HPLC. The entire sample preparation procedure is performed at low (mildly acidic) pH to suppress artificial deamidation and disulfide bond scrambling. The kit also contains an optional agent for suppression of protein oxidation during sample preparation.

Features:

- Complete sample preparation in 4.5–5 hours.
- Highly reproducible digestion results.
- For reduced and nonreduced proteins.

Storage Conditions: Store at less than –65°C.

Magne™ Protein G and Magne™ Protein A Beads

Product	Size	Cat.#
Magne™ Protein G Beads, 20% Slurry	1 ml	G7471
	5 ml	G7472
	50 ml	G7473
Magne™ Protein A Beads, 20% Slurry	1 ml	G8781
	5 ml	G8782
	50 ml	G8783

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Magne™ Protein G and Magne™ Protein A Beads are magnetic affinity beads with high specificity and high capacity for purification of immunoglobulins from cell culture media, ascites and serum samples. These paramagnetic beads are composed of iron encapsulated in macroporous cellulose with low nonspecific binding. The magnetic beads use a novel attachment chemistry to immobilize recombinant Protein G or Protein A protein molecules in the same orientation on the surface of the bead. The oriented attachment is known to improve the functionality of immobilized proteins. These beads offer a convenient method for achieving high purity and high recovery of monoclonal and polyclonal antibodies from a variety of biological samples. The superb magnetic properties of Magne™ Protein G and Magne™ Protein A Beads allow rapid and efficient capture of antibodies either with manually processed samples or in a high-throughput manner using the Promega ReliaPrep™ LV 32 HSM Instrument or a robotic platform such as the Beckman Coulter Biomek® FX.

Features:

- **High Capacity:** Binding capacities in excess of 25mg per milliliter of settled beads are observed depending on antibody species and isotype.
- **Ease of Handling:** Minimize losses during purification and increase sample throughput due to exceptional magnetic properties.
- **High Purity:** Ensure high-quality purification because of low nonspecific binding on beads.
- **Optimized Performance:** Use validated antibody purification methods for small (20µl) to medium (50ml) sample volumes.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at 4°C. Do not freeze. Do not allow beads to dry during storage or use.

Available in the Helix® on-site stocking system

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pHAb Reactive Dyes

Product	Size	Cat.#
pHAb Amine Reactive Dye	1 × 250 µg	G9841
	4 × 250 µg	G9845
pHAb Thiol Reactive Dye	1 × 250 µg	G9831
	4 × 250 µg	G9835

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: pHAb Dyes are pH sensor dyes that have very low fluorescence at pH > 7 and a dramatic increase in fluorescence as the pH of the solution becomes acidic. pHAb Dyes have excitation maxima (Ex) at 532nm and emission maxima (Em) at 560nm. pHAb Dyes are designed specifically for antibody labeling and are available in two reactive forms suitable for antibody conjugations.

pHAb Amine Reactive Dye has a succinimidyl ester group that reacts with primary amines available on the lysine amino acids on the antibodies. pHAb Thiol Reactive Dye has a maleimide group that reacts with thiols. This maleimide group is conjugated to the antibody after the cysteine disulfide bonds in the hinge region of the antibody are reduced to thiols using a reducing agent, such as DTT or TCEP.

A key feature of pHAb Dyes is that they have two sulfonate groups per dye, which increases solubility and reduces the aggregation often seen with other non-sulfonated dyes. pHAb Dyes maintain their fluorescence response to pH change even after antibody conjugation. Even though antibody conjugation is the key application, any protein containing primary amines on lysine amino acids or thiols on cysteine amino acids can be conjugated with pHAb Dyes.

Features:

- **Accurately Determine Antibody Internalization:** Increase in fluorescence as the pH of the solution becomes acidic.
- **Conjugate Directly from Biological Samples on Expressing Antibodies (i.e., Cell Media):** On-bead conjugation.
- **Measure Internalization in Real Time:** Compatible with 96-well plate-based assay.
- **Know that Antibody Conjugated with pH-Sensitive Dye is Fluorescent Only when Internalized:** pH profile of free and antibody conjugated dye is similar.
- **Get High Signal-to-Background Ratios:** Individual dyes are cell-impermeable when unconjugated.

Storage Conditions: Store at –30°C to –10°C for 1 month and below –65°C for long-term storage.

IdeS Protease and IdeZ Protease

Product	Size	Conc.	Cat.#
IdeS Protease	5,000 units		V7511
IdeS Protease	25,000 units		V7515
IdeZ Protease	5,000 units		V8341
IdeZ Protease, Frozen	2,000 units	50 u/µl	V8342
IdeZ Protease	25,000 units		V8345

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:

IdeS Protease

IdeS Protease is an immunoglobulin-degrading enzyme from *Streptococcus pyogenes* (IdeS). It is an engineered recombinant protease overexpressed in *E. coli* that cleaves Immunoglobulin G (IgG) with high specificity at a single site below the hinge region, yielding $F(ab')_2$ and Fc fragments. The protocol for a standard reaction is to add the IdeS Protease to the IgG sample, add 1 unit of IdeS Protease per 1µg of IgG to be digested, and incubate the sample at 37°C for 30–60 minutes in a neutral pH buffer.

IdeZ Protease

IdeZ Protease is an immunoglobulin-degrading enzyme from *Streptococcus equi* subspecies *zooepidemicus*. It is an engineered recombinant protease overexpressed in *E. coli*. Like IdeS Protease, IdeZ Protease specifically cleaves IgG molecules below the hinge region to yield $F(ab')_2$ and Fc fragments. However, IdeZ Protease has significantly improved activity against mouse IgG2a and IgG3 subclasses compared to IdeS Protease.

Features:

- **See Digestion in 30 Minutes with No Optimization:** Fast and easy to use.
- **Cleave Exclusively at a Single Site Below the Hinge to Produce $F(ab')_2$ and Fc Fragments:** Highly reproducible and specific.
- **Expect High Performance:** Essentially 100% complete digestion.
- **Effectively Cleave Many IgG Molecules:** Both IdeS and IdeZ Proteases effectively cleave human IgG1, IgG2, IgG3 and IgG4, monkey, sheep, rabbit, humanized and chimeric IgGs as well as Fc-fusion proteins. However, mouse IgG2a and IgG3 are cleaved by IdeZ Protease only.

Storage Conditions: Store IdeS Protease at –30°C to –10°C. Store IdeZ Protease at –30°C to –10°C.

PNGase F

Product	Size	Conc.	Cat.#
PNGase F	500 units	10 u/µl	V4831
For Research Use Only. Not for Use in Diagnostic Procedures.			

Description: PNGase F is a recombinant glycosidase cloned from *Elizabethkingia miricola* and overexpressed in *E. coli*. PNGase F has a molecular weight of 36kDa. PNGase F catalyzes the cleavage of N-linked oligosaccharides between the innermost GlcNAc and asparagine residues of high mannose, hybrid and complex oligosaccharides from N-linked glycoproteins. PNGase F will not remove oligosaccharides containing Alpha-(1,3)-linked core fucose commonly found on plant glycoproteins.

Unit Definition: One unit of PNGase F will catalyze the deglycosylation of 1 nanomole of denatured Ribonuclease B (RNase B) in one minute at 37°C. One Promega unit is equal to 1 IUB milliunit.

Molecular Weight: PNGase F has a molecular weight of approximately 36kDa.

Physical Form: PNGase F is supplied as a liquid in 20mM Tris-HCl (pH 7.5 at 25°C), 50mM NaCl and 5mM EDTA at a concentration of 10,000u/ml.

Storage Conditions: Store at 2–10°C.

ISOQUANT® Isoaspartate Detection Kit

Product	Size	Cat.#
ISOQUANT® Isoaspartate Detection Kit	100 assays	MA1010
Not For Medical Diagnostic Use.		

Description: The ISOQUANT® Isoaspartate Detection Kit is intended for quantitative detection of isoaspartic acid residues in proteins and peptides, which can result from the gradual, nonenzymatic deamidation of asparagine or rearrangement of aspartic acid residues during storage or handling. Because the kit does not depend on the monitoring of charge differences for detection, charge heterogeneity does not interfere with the assay. The ISOQUANT® Kit can be used on peptides or proteins such as monoclonal antibodies.

Features:

- **Great Efficiency:** Simple procedure with a test time of less than one hour. Automation possible with HPLC autosampler capability.
- **Economical:** HPLC detection eliminates cost and inconvenience of radioactive materials handling.
- **Analytical:** Quantitative results available.
- **Versatile:** Perform individual samples or batches. Small sample size makes the assay suitable for research, analytical methods, formulations and process development work.
- **Robust:** Not affected by common buffer components.
- **HPLC Detection Method:** Fits with existing equipment and expertise.
- **Sensitive:** Detects isoaspartate resulting from aspartic acid rearrangement as well as deamidation of asparagine.

Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system

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Antibody Purification

High Capacity Magne® Streptavidin Beads and Goat Anti-Human Biotinylated IgG

Product	Size	Cat.#
High Capacity Magne® Streptavidin Beads	3 ml	V7820
Goat Anti-Human Biotinylated IgG	4 ml	V7830

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: High Capacity Magne® Streptavidin Beads are magnetic affinity beads with high specificity and high capacity for binding biotinylated antibodies and proteins. The magnetic beads are composed of iron encapsulated by macroporous cellulose, resulting in low nonspecific binding and making them ideal for use with complex biological samples. The beads also have excellent magnetic properties for rapid and efficient capture using a variety of magnetic stands.

The affinity of biotin for streptavidin ($K_d = 10^{-15}$) is one of the strongest and most stable interactions in biology; hence, the biotin-streptavidin interaction cannot be reversed under non-denaturing conditions. Therefore, we do not recommend the use of beads for applications in which the biotinylated molecules need to be recovered from the beads.

High Capacity Magne® Streptavidin Beads are well suited for pharmacokinetics studies of therapeutic antibodies during preclinical studies. For example, biotinylated anti-human IgG bound to the High Capacity Magne® Streptavidin Beads can be used for enrichment of Human IgG from serum or plasma samples of non-primate animals and analyzed using mass spectrometry. The high capacity of the beads enables enrichment of antibodies over a wide concentration range using small amount of beads. Enrichment can be automated for high throughput and scaled up to handle various sample volumes.

Goat Anti-Human Biotinylated IgG is provided at a concentration of 0.5mg/ml in phosphate-buffered saline (pH 7.4) with 0.1% sodium azide.

Features:

- **Improve Your Results:** High binding capacity and low non-specific binding.
- **Use in High-Throughput Formats with Robotics:** Rapid magnetic response.
- **Characterize Large Dynamic Range:** High binding capacity.

Storage Conditions: Store at 4°C. Do not freeze the solution or let it dry during storage or use.

Magne™ Protein G and Magne™ Protein A Beads

Product	Size	Cat.#
Magne™ Protein G Beads, 20% Slurry	1 ml	G7471
	5 ml	G7472
	50 ml	G7473
Magne™ Protein A Beads, 20% Slurry	1 ml	G8781
	5 ml	G8782
	50 ml	G8783

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Magne™ Protein G and Magne™ Protein A Beads are magnetic affinity beads with high specificity and high capacity for purification of immunoglobulins from cell culture media, ascites and serum samples. These paramagnetic beads are composed of iron encapsulated in macroporous cellulose with low nonspecific binding. The magnetic beads use a novel attachment chemistry to immobilize recombinant Protein G or Protein A protein molecules in the same orientation on the surface of the bead. The oriented attachment is known to improve the functionality of immobilized proteins. These beads offer a convenient method for achieving high purity and high recovery of monoclonal and polyclonal antibodies from a variety of biological samples. The superb magnetic properties of Magne™ Protein G and Magne™ Protein A Beads allow rapid and efficient capture of antibodies either with manually processed samples or in a high-throughput manner using the Promega ReliaPrep™ LV 32 HSM Instrument or a robotic platform such as the Beckman Coulter Biomek® FX.

Features:

- **High Capacity:** Binding capacities in excess of 25mg per milliliter of settled beads are observed depending on antibody species and isotype.
- **Ease of Handling:** Minimize losses during purification and increase sample throughput due to exceptional magnetic properties.
- **High Purity:** Ensure high-quality purification because of low nonspecific binding on beads.
- **Optimized Performance:** Use validated antibody purification methods for small (20µl) to medium (50ml) sample volumes.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at 4°C. Do not freeze. Do not allow beads to dry during storage or use.

Promega

Drug Discovery

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Drug Discovery

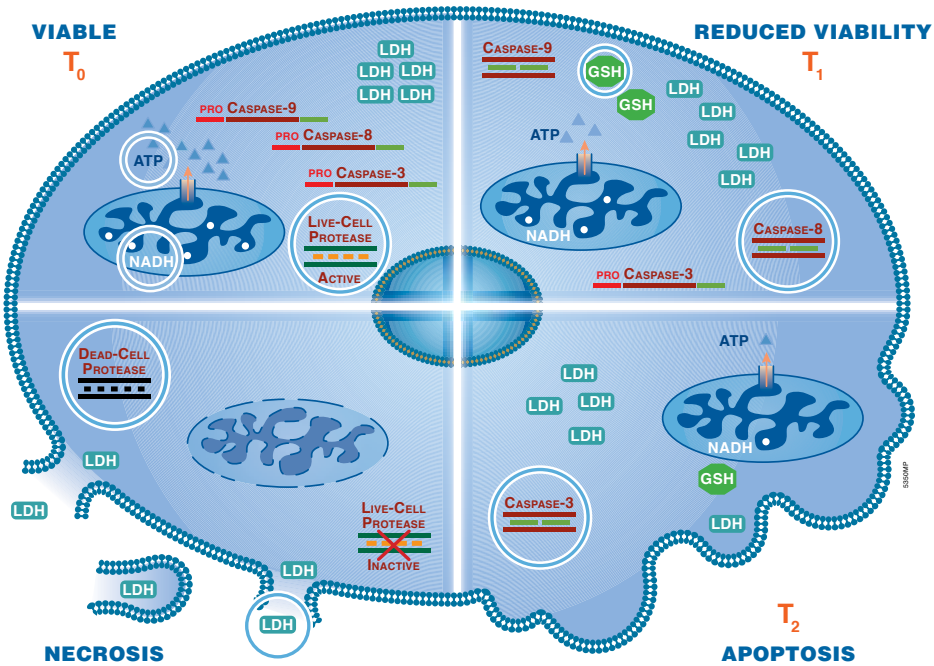
Products tagged with the Helix® icon are available for distribution through our convenient on-site stocking program in a freezer, refrigerated unit or an ambient cabinet.

For more information visit: **www.promega.com/helix**

Available in the Helix® on-site stocking system

Drug Discovery Solutions

Harnessing the Power of Bioluminescence for Biochemical and Cell-Based Assays



Today's drug development needs are mature and complex. Instead of targets, biology and workflow are key elements. Drug developers in academia and industry alike need assays that are sensitive, robust, scalable and easy to use, that fit their workflows while maintaining physiological relevance.

Promega has developed key platform technologies based on luminescence and fluorescence that can be applied across the discovery spectrum.

Promega continues to offer solutions that enable you to develop better drugs, faster:

- Better profiling data
- More biologically relevant data
- Multiplexing solutions for increased understanding of biology
- Custom Assay Services (CAS@promega.com)

Starting with a single, well-defined biological reaction, we have developed a solid technology platform from which hundreds of unique in vitro biochemical and cell-based assays have been configured.

We offer multiple robust and functionally tested assays for many early drug discovery needs, including custom manufacturing and assay development capabilities.

Custom Assay Services

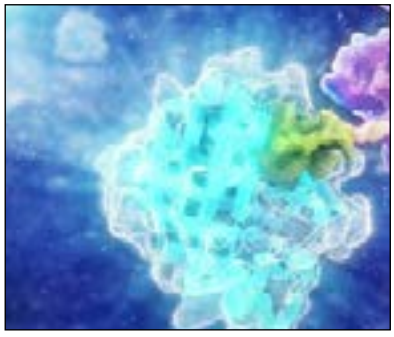
Biology-driven, Promega technology-enabled custom solutions for:

- Cell Engineering
- Assay Development & Qualification
- Assay-Ready Cells In-Scale
- Custom Assay Materials

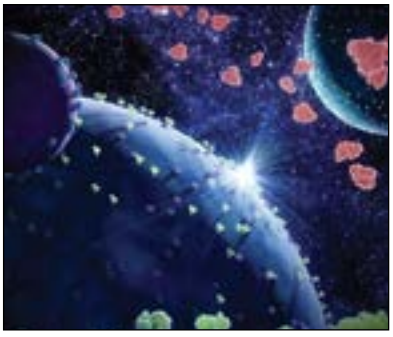
cas@promega.com

Solutions for Small Molecule Screening

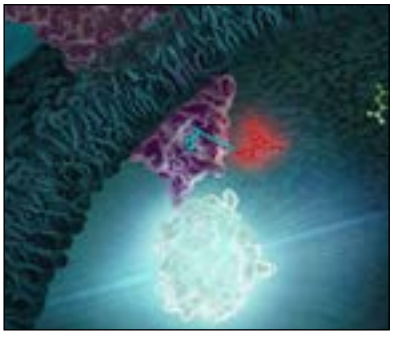
*Visit **www.promega.com/drugdiscovery** to explore our portfolio of assays and custom assay development services, all built around innovative, sensitive bioluminescence technology.*



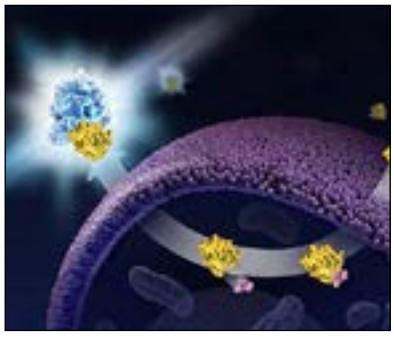
Targeted Protein Degradation
Study small molecule-induced protein degradation in live cells.



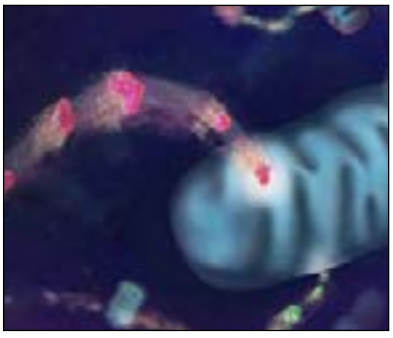
CRISPR-Enabled Endogenous Biology
Tools to harness the power of CRISPR-based gene editing and live-cell bioluminescent detection to study endogenous protein dynamics



Target Engagement
Measure compound binding at select target proteins in real time.



Cell Health Screening Assays
Examine cell health in response to small molecule drugs with high-throughput cell viability and cytotoxicity assays.



Energy Metabolism and Oxidative Stress
Measure metabolic activity, including glucose uptake, oxidative stress and dinucleotide production.

ADME-Tox Assays
Study drug metabolism and toxicity using sensitive high-thoughput CYP450 assays.

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Preprocessing and Differential Extraction

SwabSolution™ Kit, PunchSolution™ Kit and 5X AmpSolution™ Reagent

Product	Size	Cat.#
SwabSolution™ Kit	100 preps	DC8271
PunchSolution™ Kit	100 preps	DC9271
5X AmpSolution™ Reagent	100 preps	DM1231

Not For Medical Diagnostic Use.

Description: The SwabSolution™ Kit, PunchSolution™ Kit and 5X AmpSolution™ Reagent allow fast and simple processing of swabs and punches for PowerPlex® System analysis. These products are intended for preparation of single-source reference, database and paternity samples where sample purification is unnecessary.

The SwabSolution™ Kit is used for rapid processing of swabs for STR analysis using PowerPlex® Systems. The SwabSolution™ Kit contains SwabSolution™ Reagent, which is used to generate a buccal swab extract that is added to the PowerPlex® System reaction. In addition, the SwabSolution™ Kit contains the 5X AmpSolution™ Reagent, which enables direct amplification of DNA from swabs using certain PowerPlex® Systems. See the supported PowerPlex® Systems at: **www.promega.com/directamp/**

The PunchSolution™ Kit is used for rapid processing of punches from nonFTA storage cards (S&S 903, Bode Buccal Collector™ device, etc.) for STR analysis using PowerPlex® Systems. The PunchSolution™ Kit contains PunchSolution™ Reagent, which is used to pretreat nonFTA punches prior to adding the PowerPlex® PCR amplification mix. In addition, the PunchSolution™ Kit contains the 5X AmpSolution™ Reagent, which enables direct amplification of DNA from punches using certain PowerPlex® Systems. See the supported PowerPlex® Systems at: **www.promega.com/directamp/**

The 5X AmpSolution™ Reagent enables direct amplification of DNA from unwashed FTA® punches, nonFTA punches and swabs using certain PowerPlex® Systems.

Features:

- **Save Time:** Rapid, simple preparation methods for swabs and punches can save 2–4 hours per plate of samples.
- **Experience Compatibility with Most PowerPlex® Systems:** Using SwabSolution™ Kit, PunchSolution™ Kit and 5X AmpSolution™ Reagent increases the speed and versatility of the PowerPlex® Systems.

Storage Conditions: Upon receipt of kit, thaw and mix as per instructions and store at 4°C.

Casework Direct Kit, Custom

Product	Size	Cat.#
Casework Direct Kit, Custom	1 each	AX4560

Not for Medical Diagnostic Use.

Description: The sheer volume of property crime and sexual assault evidentiary samples submitted to forensic laboratories has compelled many laboratories to actively seek out better solutions for processing these challenging sample types. The Casework Direct Kit is designed to rapidly process swabs from casework samples or cuttings of sexual assault swabs and stained clothing.

Unlike competing kits, lysates generated with the Casework Direct Kit are compatible with our quantification and STR amplification product lines. These lysates may be amplified with the PowerQuant® or Plexor® HY Systems to screen sexual assault samples for male DNA and to normalize human template for STR amplification with one of the PowerPlex® STR Systems.

When used with the PowerQuant® System, valuable workflow information such as the presence/absence of male DNA, degradation or potential PCR inhibition is provided.

Features:

- No-wash protocol maximizes the chance of recovering DNA from trace samples
- Quickly generates lysates that are compatible with PowerQuant®, Plexor® HY and PowerPlex® Systems
- Useful for Y-screening and selection of evidentiary samples for STR testing

Storage Conditions: Store at –30°C to –10°C.

Differex™ System

Product	Size	Cat.#
Differex™ System	50 samples	DC6801
	200 samples	DC6800
Manual Differex™ Magnet	1 each	V1591
Available Separately		
Differex™ Digestion Buffer	150 ml	A8501
Differex™ Separation Solution	40 ml	A8511
ClickFit Microtube, 1.5ml	1,000 /pack	V4741

A8501, DC6801, A8511, DC6800 Not For Medical Diagnostic Use.
V1591, V4741 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Differex™ System extracts DNA from sexual assault samples easily and quickly. The system provides a simple and fast method for separating male and female fractions of a sample, making it possible to analyze samples more quickly and efficiently.

The Differex™ System offers recovery similar to that of the standard method commonly used for differential extraction. The Differex™ System is used in combination with the DNA IQ™ System and Slicprep™ 96 Device on robotic platforms to process up to 48 differential extractions in less than 5 hours, including incubation time, and less than 1 hour of hands-on time.

Automated Differex™ System methods are available for the Biomek® 2000 and 3000 laboratory automation workstations as well as the Tecan Freedom EVO® liquid handler. Contact Promega Technical Services for additional information. A manual protocol for the Differex™ System is available for laboratories not yet using robotic platforms for DNA extraction.

Features:

- **Automated Differential Extractions:** The Differex™ System is the first and only system that allows a forensic laboratory to automate every step of differential extraction.
- **Direct Compatibility with the DNA IQ™ System and Downstream STR Applications:** Clean DNA extracts mean you can be confident in your ability to obtain results regardless of your choice of STR systems.
- **Robust Results With Even Tough Samples:** The Differex™ System works with challenging new and old samples typical of those from sexual assaults.
- **More Information About Automated Differex™ System:** See the Automated Differex™ System page at: **www.promega.com/products/pm/genetic-identity/automated-differex/**

Storage Conditions: Store at room temperature.

Consumables for DNA Extraction in PCR, qPCR and CE Applications

Product	Size	Cat.#
Septa Mat, 96-Well	10 each	CE2696
Optical Plate Seals	100 each	V7840
Strip Cap, 8-Well	120 each	V7850

Not For Medical Diagnostic Use.

Description: Our plastic consumables provide excellent performance at a good value. These PCR plastics and consumables support DNA extraction, quantification, amplification and capillary electrophoresis of DNA. The PCR plastics and consumables are made for a variety of thermal cyclers, real-time PCR systems and CE instrumentation.

Optical Plate Seals are used for sealing microplates to prevent evaporation and contamination in real-time PCR; they are compatible with real-time PCR systems such as the Applied Biosystems 7500 Real-Time System.

Strip Caps are eight-strip domed caps for PCR plates and tubes to prevent evaporation and contamination in PCR.

Septa Mats are used for sealing 96-well plates in capillary electrophoresis; they are compatible with Spectrum CE System and ABI Sequencers and Genetic Analyzers.

Features:

- PCR plastics and consumables made for a variety of thermal cyclers, real-time PCR systems and CE instrumentation.

Storage Conditions: Store all consumables at 15–30°C.

Available in the Helix® on-site stocking system

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Slicprep™ 96 Device

Product	Size	Cat.#
Slicprep™ 96 Device	10 pack	V1391
Not For Medical Diagnostic Use.		

Description: The Slicprep™ 96 Device allows solid material to be incubated with a solution in a basket that is placed in a deep-well plate. Following incubation, the basket is raised with a collar for an additional 0.5ml of space below the basket. This allows removal of the incubation liquid and solubilized material from the solid support without having to transfer material to another tube or plate. One-millimeter holes in the bottom of the basket allow rapid flow of liquid in and out of the baskets. The device is manufactured with polypropylene to reduce adsorption of biological material onto the plastic and give it strength and stability over a wide temperature range. The components are manufactured and assembled in a HEPA-filtered clean room with gloved and gowned personnel to reduce the chance of DNA contamination.

The package contains 10 units of the Slicprep™ 96 Device. Each unit consists of three components: the 96 Spin Basket, 96 Deep Well Plate and U-Shaped Collar, which is used to raise the baskets during centrifugation.

Storage Conditions: Store at 22–25°C.

Bone DNA Extraction Kit, Custom

Product	Size	Cat.#
Bone DNA Extraction Kit, Custom	100 preps	AX6780
Not For Medical Diagnostic Use.		

Description: In certain cases involving missing persons, mass disasters and anthropological excavations, bone and teeth are often the only sample types available for identification. Further, these samples are often subjected to environmental damage, and co-extraction of environmental inhibitors during purification limits their usability in STR typing experiments. Purification of DNA free of inhibitors is a crucial first step in determining the success of obtaining a usable profile from these samples.

A short preprocessing protocol followed by purification of DNA using DNA IQ™ chemistry yields inhibitor-free DNA that is compatible with PowerQuant® or Plexor® HY Systems for human and male DNA quantification and PowerPlex® STR Systems for generation of a STR profile.

Features:

- Quick preprocessing of bone powder using Demineralization Buffer, Custom
- Compatible with manual and Maxwell® DNA IQ™ chemistry
- Yields DNA free of inhibitors and compatible with downstream amplification reactions

Storage Conditions: Store at 15–30°C.

DNA Isolation

DNA IQ™ System

Product	Size	Cat.#
DNA IQ™ System	100 reactions	DC6701
	400 reactions	DC6700
Casework Extraction Kit	100 reactions	DC6745
Tissue and Hair Extraction Kit	100 reactions	DC6740
Available Separately		
Lysis Buffer	150 ml	A8261
2X Wash Buffer	70 ml	A8271
Elution Buffer	50 ml	A8281
DNA IQ™ Resin	50 ml	A8251
DNA IQ™ Spin Baskets	1,000 /bag	V1221
Proteinase K	100 mg	V3021
DTT, Molecular Grade (Dry Powder)	5 g	V3151
ClickFit Microtube, 1.5ml	1,000 /pack	V4741

A8261, A8271, A8281, DC6745, A8251, V1221 Not For Medical Diagnostic Use. DC6701, DC6700, DC6740, V3021, V3151, V4741 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The DNA IQ™ System is a DNA isolation system designed specifically for forensic and paternity laboratories. This system employs novel paramagnetic particles to isolate clean DNA for use with short tandem repeat (STR) analysis. The DNA IQ™ System can be used to extract DNA from a variety of sample types, including stains and liquid samples. Protocols for database samples and casework samples are available.

The unique DNA IQ™ Resin removes PCR inhibitors and contaminants frequently encountered in casework samples. When working with larger sample volumes, such as those found in paternity and databasing, the DNA IQ™ System can deliver a consistent amount of total DNA. Samples including buccal swabs, liquid blood and stains on FTA® and other blood cards have been used with the DNA IQ™ System.

The DNA IQ™ System has been tested with the PowerQuant™ and Plexor® HY Systems and PowerPlex® Systems to ensure a streamlined process. This translates into reliable products that give optimal results from isolation to quantification and STR analysis.

Genomic DNA isolation using the DNA IQ™ System has been automated on the Biomek® 2000 and 3000 laboratory automation workstations as well as the Tecan Freedom EVO® liquid handler. Contact Promega Technical Services for additional information.

Features:

- **Rapid:** Only a few quick steps to obtain clean DNA with fewer PCR inhibitors.
- **Flexible:** One simple system for use with casework, paternity and database samples.
- **Efficient:** Sensitive to minute sample sizes. In addition, no harmful organic solvents such as phenol and chloroform are used, so use of a hood is not required and disposal of hazardous chemicals is eliminated.

Storage Conditions: Store the DNA IQ™ System at 22–25°C. Store the Casework Extraction Kit at 15–30°C.

DNA IQ™ Reference Sample Kit for Maxwell® 16

Product	Size	Cat.#
DNA IQ™ Reference Sample Kit for Maxwell® 16	48 preps	AS1040
Available Separately		
ClickFit Microtube, 1.5ml	1,000 /pack	V4741

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The DNA IQ™ Reference Sample Kit for Maxwell® 16 is designed specifically for optimal DNA extraction from buccal swabs, FTA® blood card punches, liquid blood or other high-concentration DNA reference samples. These samples are typically encountered in forensic, convicted-offender database and paternity testing. The kit contains the same trusted reagents used in the DNA IQ™ System in a convenient prepackaged format and is optimized to yield a final DNA concentration that minimizes the need for concentration or dilution prior to amplification. Liquefied samples are placed directly into the cartridges, and genomic DNA ready for amplification is obtained in approximately 20 minutes.

Features:

- **Maximize Your Time:** Automating DNA extraction reduces hands-on bench time spent manually extracting DNA.
- **Gain Confidence in Your Results:** Instrument design, optimized reagents and automated methods provide consistent yield and purity.
- **Use Trusted DNA IQ™ Chemistry:** The DNA IQ™ System is the recognized leader in automated DNA extraction chemistries and is included in the prefilled Maxwell® 16 reagent cartridges.

Storage Conditions: Store at 22–25°C.

Available in the Helix® on-site stocking system

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Available in the Helix® on-site stocking system

DNA IQ™ Casework Pro Kit for Maxwell® 16

Product	Size	Cat.#
DNA IQ™ Casework Pro Kit for Maxwell® 16	48 preps	AS1240
Available Separately		
Casework Extraction Kit	100 reactions	DC6745
LEV Plungers	50 /pk	AS6151
LEV Elution Tubes	50 /pk	AS6201
ClickFit Microtube, 1.5ml	1,000 /pack	V4741

AS1240, DC6745 Not For Medical Diagnostic Use. AS6151, AS6201, V4741 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The DNA IQ™ Casework Pro Kit for Maxwell® 16 includes newly designed plungers and optimized preprocessing, which results in improved DNA yields.

The DNA IQ™ Casework Pro Kit for Maxwell® 16 is designed for optimal DNA extraction from forensic casework samples. These samples may include blood stains, semen stains, hairs, cigarette butts, tissue samples, and trace or "touch" DNA samples regularly encountered in forensic DNA analysis. The kit contains the same trusted reagents used in the DNA IQ™ System in a convenient, prefilled cartridge format and is optimized to provide a final DNA extract in a concentrated format.

The DNA IQ™ Casework Pro Kit for Maxwell® 16 uses a plastic cartridge and plunger that allow DNA elution in a final volume of no more than 50µl. DNA IQ™ Lysis Buffer, Resin and Wash Buffer are included in the prefilled cartridge, and DNA IQ™ Elution Buffer is included in the kit to ensure proper storage of the DNA. The DNA IQ™ Casework Pro Kit is compatible with the Maxwell® 16 Forensic Instrument, which includes the hardware necessary to use this kit.

The Casework Extraction Kit improves DNA extraction efficiency from a broad panel of sample types and is used for preprocessing samples before DNA extraction with the DNA IQ™ Casework Pro Kit for Maxwell® 16.

Features:

- **Reduced Elution Volumes:** Elute your sample in less than 50µl of DNA IQ™ Elution Buffer. No need for post-purification concentration steps.
- **Confidence in Your Chemistry:** The DNA IQ™ System is the recognized leader in automated DNA extraction chemistries and is included in the prefilled Maxwell® 16 reagent cartridges.
- **Preprogrammed Methods:** There is no need for programming or an external computer. The Maxwell® 16 Instrument is preloaded with all of the necessary methods, which are optimized for maximum performance.

Storage Conditions: Store at 15–30°C.

Forensic Grade Consumables

Product	Size	Cat.#
Elution Tubes, 0.5ml	50/pack	AS7201
FSC Plungers	50/pack	AS7151
LEV Plungers	50/pack	AS1651
Nuclease-Free Water	150ml	P1196
DNA IQ™ Spin Baskets	50/pack	V1225
ClickFit Microtube, 1.5ml	100/pack	V4745

AS7201, AS7151, AS1651, V1225, V4745 Not For Medical Diagnostic Use. P1196 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Promega forensic products are manufactured in alignment with the ISO 18385 standard. This standard ensures minimal risk of human DNA contamination for products used to collect, store and analyze biological materials for forensic purposes. Use with both Maxwell® FSC DNA IQ™ Casework Kit and DNA IQ™ Casework Pro Kit for Maxwell® 16. Learn more at: **www.promega.com/products/genetic-identity/forensic-grade-faq/**

Storage Conditions: Store all Forensic Grade Consumables at 15–30°C. Nuclease-Free Water can be stored at any temperature below 30°C.

Casework Consumables

Product	Size	Cat.#
CW Spin Baskets	50/pack	AS8101
CW Microfuge Tubes, 1.5ml	50/pack	AS8201

Not For Medical Diagnostic Use.

Description: The CW Spin Baskets and CW Microfuge Tubes, 1.5ml, are ethylene-oxide-treated and enable preprocessing of solid samples without the need to transfer swabs, simplifying the process and reducing the chance of cross-contamination. Use with both Maxwell® FSC DNA IQ™ Casework Kit and DNA IQ™ Casework Pro Kit for Maxwell® 16.

Storage Conditions: Store all consumables at 15–30°C.

Genetic Identity Automation Hardware and Software

Product	Size	Cat.#
Shaker Integration Plate	1 each	V3691
Deep Well Heat Transfer Block	1 each	V6741
VARIOMAG® Teleshake (110V, for North America use only)	1 each	V6751
V&P Scientific Heating Block (North America use only)	1 each	V6761
1.2ml, Round-Bottom Deep Well Plate	50 /case	V6771
2.2ml, Square-Well Deep Well Plate	50 /case	V6781
Pyramid-Bottom Reservoir, 12 Column	25 /case	V6791
Pyramid-Bottom Reservoir	25 /case	V6801
1.1ml, Square-Well, V-Bottom Deep Well Plate	25 /case	V6821
10ml, 24-Well Deep Well Plate	25 /case	V6831
Four-Position Tube Holder	1 each	V1601
STR Normalization Manager™	3 CD-ROM	DG1820
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The Genetic Identity Automation Hardware and Software can be used on automated platforms in conjunction with Promega Genetic Identity products. Contact Technical Services for specific application and platform information.

Maxwell® FSC Instrument

Product	Size	Cat.#
Maxwell® FSC Instrument	1 each	AS4600
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The Maxwell® FSC Instrument, along with DNA IQ™ chemistry, offers easy-to-use, consistent, automated nucleic acid extraction from casework samples such as blood stains, semen stains, hairs, cigarette butts, tissues and trace DNA samples. Automated DNA extraction saves laboratories time and labor costs and frees staff to work on casework analysis.

Features:

- High-quality DNA extraction with minimal hands-on time.
- Bar code reader for simplified data entry.
- Intuitive software and touch screen interface.

Storage Conditions: Store at 15–30°C.

Maxwell® FSC DNA IQ™ Casework Kit

Product	Size	Cat.#
Maxwell® FSC DNA IQ™ Casework Kit	48 preps	AS1550
Not For Medical Diagnostic Use.		

Description: The Maxwell® FSC DNA IQ™ Casework Kit is designed for optimal DNA extraction from forensic casework samples. These samples may include blood stains, semen stains, hairs, cigarette butts, tissue samples and trace or "touch" DNA samples regularly encountered in forensic DNA analysis. The kit contains the same trusted reagents as the DNA IQ™ System in a convenient, prefilled cartridge format and is optimized to provide a final DNA extract in a pure, concentrated format.

The Maxwell® FSC DNA IQ™ Casework Kit uses a plastic cartridge and newly designed plunger that allow DNA elution in a final volume of no more than 50µl. DNA IQ™ Lysis Buffer, Resin and Wash Buffer are included in the prefilled cartridge, and DNA IQ™ Elution Buffer is included in the kit to ensure proper storage of the DNA. The Maxwell® FSC DNA IQ™ Casework Kit is compatible with the Maxwell® FSC Instrument (Chapter 13), which includes a surface tablet and easy, intuitive interface.

Features:

- Use for blood stains, semen stains, hairs, cigarette butts, tissue samples and trace or "touch" DNA samples.
- Easy-to-use spin baskets circumvent the need to transfer swabs helping minimize cross-contamination.
- Uses the same reagents as the DNA IQ™ Systems in an automated format.

Storage Conditions: Store at 15–30°C.

Available in the Helix® on-site stocking system

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Human-Specific DNA Quantitation

PowerQuant™ System

Product	Size	Cat.#
PowerQuant™ System	200 reactions	PQ5002
	800 reactions	PQ5008
PowerQuant™ Calibration Kit	1 each	DS1221
Available Separately		
PowerQuant™ Male gDNA Standard	150 µl	DD3021
Not For Medical Diagnostic Use.		

Description: The PowerQuant™ System is a 5-color, 4-target probe-based qPCR assay that simultaneously quantifies the total amount of amplifiable autosomal and Y-chromosomal DNA in a single assay using the same DNA standards. During amplification, annealing of the probe to its target sequence generates a substrate that is cleaved by the 5′ nuclease activity of *Taq* DNA polymerase when the enzyme extends from an upstream primer into the region of the probe. This liberates the fluorescent dye from its proximal position to the quencher and, therefore, an increase in amplification cycles leads to increase in fluorescence.

The kit contains an internal PCR control (IPC) to test for false-negative results that may occur in the presence of PCR inhibitors.

Advantages of this system include:

- More consistent Auto/Y ratio.
- Assessment of DNA degradation.
- Reliable sample quality assessment.
- Flexible options for 4-point to 7-point standard curve.

The PowerQuant™ System is optimized for use on the Applied Biosystems 7500 real-time PCR systems with v2.0.6 or HID1.1 or higher software versions.

Features:

- **Use Robust, Instrument-Native Software for Most Analyses:** Probe-based chemistry.
- **Reliably Quantify Sample:** More consistent Auto/Y ratio.
- **Assess Sample Quality:** Degradation marker included.
- **Achieve Sensitivity:** Consistent and reproducible detection of 2pg of DNA.
- **Analyze Normalization for STR Analysis:** Data analysis tool.
- **Process More Samples Per Plate:** 4-point standard curve.

Storage Conditions: Store at –30°C to –10°C.

Plexor® HY System

Product	Size	Cat.#
Plexor® HY System	200 reactions	DC1001
	800 reactions	DC1000
Available Separately		
Plexor® Calibration Kit, Set A	1 each	DC1500
Water, Amplification Grade	6,250 µl	DW0991
Not For Medical Diagnostic Use.		

Description: The Plexor® HY System is a real-time PCR assay to determine the concentration of total human DNA and male human DNA simultaneously in one reaction. The kit contains an internal PCR control (IPC) to test for false-negative results that may occur in the presence of PCR inhibitors and a melt curve function to confirm that the correct product was amplified.

The Plexor® HY System is a sensitive multiplex kit that routinely detects approximately 6.4pg of total DNA. PCR setup is performed at room temperature and is compatible with automated platforms.

The Plexor® Systems work by measuring a reduction in fluorescent signal during amplification. Amplification of each target uses only two primers, one of which contains both a fluorescent tag and a modified base. As amplification proceeds, fluorescence is reduced by site-specific incorporation of a fluorescent quencher opposite the complementary modified base. The quencher is in close proximity to a fluorescent dye located on the end of the primer, resulting in a reduction of fluorescent signal. After PCR, a melt analysis can be performed to provide an internal control for the final assay design or to expedite troubleshooting.

The Plexor® HY System is optimized for use on the Applied Biosystems 7500 and 7500 FAST real-time PCR systems and Stratagene Mx3005P® and Mx3000P® qPCR systems. For information about use with other qPCR instrumentation, contact Promega Technical Services.

The Plexor® Analysis Software is available for free download. The unique functions of this software allow you to quickly and easily review data and create reports. Replicate samples are automatically averaged, template amounts are calculated and the necessary volume of DNA is displayed for your optimized STR amplification conditions.

Features:

- **Simultaneous Quantification of Autosomal and Y-Chromosome DNA:** Less variability, less time, more valuable data.
- **Consistent and Reproducible Detection of 6.4pg of DNA:** If you can't detect it with Plexor® HY, you can't detect it with your STR system.
- **Internal Positive Control and Melt-Curve Analysis:** Guard against false-negative and false-positive results, allowing you to be confident in your data.

Storage Conditions: Store at –20°C.

STR Amplification

PowerPlex® ESX and ESI Fast Systems

Product	Size	Cat.#
PowerPlex® ESX 16 Fast System	100 reactions	DC1611
	400 reactions	DC1610
PowerPlex® ESI 16 Fast System	100 reactions	DC1621
	400 reactions	DC1620
PowerPlex® ESX/ESI 16 Fast Systems Bundle	100 reactions	DC1631
	400 reactions	DC1630
PowerPlex® ESX 17 Fast System	100 reactions	DC1711
	400 reactions	DC1710
PowerPlex® ESI 17 Fast System	100 reactions	DC1721
	400 reactions	DC1720
PowerPlex® ESX/ESI 17 Fast Systems Bundle	100 reactions each	DC1731
	400 reactions each	DC1730

Available Separately	Size	Conc.	Cat.#
Water, Amplification Grade	6,250 µl		DW0991
2800M Control DNA	500 µl	0.25 ng/µl	DD7251
	25 µl	10 ng/µl	DD7101

Not For Medical Diagnostic Use.

Description: The PowerPlex® ESX and ESI Fast Systems meet the ENFSI recommendations for DNA profile sharing across Europe and allow co-amplification and detection of D3S1358, D8S1179, D18S51, D21S11, FGA, TH01, vWA, D2S441, D10S1248, D22S1045, D1S1656, D12S391, D2S1338, D16S539, D19S433, SE33 and Amelogenin. Rapid cycling technology enables amplification to be done in less than 50 minutes.

These kits are available in multiple formats, including the option to detect SE33, to accommodate various requirements or preferences. Additionally, the kits have superior tolerance to common inhibitors and superior sensitivity to obtain full profiles from low-level DNA and are robust enough to genotype degraded DNA samples through the use of miniSTR loci.

This system is compatible with ABI PRISM® 310, 3100 and 3100-*Avant* Genetic Analyzers and Applied Biosystems® 3130, 3130*xl*, 3500 and 3500xL Genetic Analyzers.

Features:

- **<50-Minute Amplification Time:** Shorter turnaround time to results.
- **Multiple Kit Configurations:** Confirm results from poor-quality samples.
- **ENFSI-Recommended Loci:** Data are more easily shared across borders.
- **Mini-STRs:** Obtain more complete profiles from degraded DNA.
- **Robust Buffer:** Achieve better results with challenging casework samples.
- **One Kit for Databasing and Casework Samples:** Simplified QC and inventory management.

Storage Conditions: Store at –20°C.

PowerPlex® Fusion 6C System

Product	Size	Cat.#
PowerPlex® Fusion 6C System	50 (or 100 direct-amp) reactions	DC2705
	200 (or 400 direct-amp) reactions	DC2720
	800 (or 1,600 direct-amp) reactions	DC2780

Available Separately	Size	Conc.	Cat.#
PowerPlex® 6C Matrix Standard	5 preps		DG4900
WEN Internal Lane Standard 500	200 µl		DG5001
2800M Control DNA	25 µl	10 ng/µl	DD7101

Not For Medical Diagnostic Use.

Description: The PowerPlex® Fusion 6C System is a 27-locus multiplex for human identification applications including forensic analysis, relationship testing and research use. This six-color system allows co-amplification and fluorescent detection of the 18 autosomal loci in the expanded CODIS core loci (CSF1PO, FGA, TH01, vWA, D1S1656, D2S441, D2S1338, D3S1358, D5S818, D7S820, D8S1179, D10S1248, D12S391, D13S317, D16S539, D18S51, D19S433 and D21S11) and Amelogenin and DYS391 for gender determination. The Penta D, Penta E, TPOX, D22S1045 and SE33 loci also are included to increase discrimination and allow searching of databases that include profiles with these loci. Finally, two rapidly mutating Y-STR loci, DYS570 and DYS576, are included in the multiplex.

The PowerPlex® Fusion 6C System works well with extracted DNA samples, including low amounts of template DNA, mixtures and inhibitor-laden samples. The PowerPlex® Fusion 6C System is also compatible with direct amplification, enabling streamlined STR databasing efforts. Amplification can be successfully performed with sample types such as FTA® card punches as well as pretreated swabs, Bode Buccal DNA Collector™ punches or S&S 903 punches. Fast cycling conditions used with the PowerPlex® Fusion 6C System reduce sample-processing time for all samples.

The PowerPlex® Fusion 6C System is compatible with the Applied Biosystems® 3500 and 3500xL Genetic Analyzers as well as Applied Biosystems® 3130 and 3130*xl* Genetic Analyzers with Data Collection Software Version 4.0 with the DC v4 6-Dye Module v1 License (Life Technologies).

Features:

- **Experience Highest Inter-Database Compatibility and Discrimination:** 27 loci (23 autosomal STRs, 3 Y-STRs and Amelogenin); amplify all loci in the expanded CODIS core loci.
- **Streamline Your Workflows:** Use direct-amplification protocols and rapid cycling.
- **Reduce Repeat Analysis of Difficult Samples:** Experience high inhibitor tolerance and sensitivity for casework.
- **Simplify Your Validation and QC:** Use one kit for both casework and database sections.

Storage Conditions: Store all components at –30°C to –10°C. After the first use, store the PowerPlex® Fusion 6C System components at 2–10°C, where components are stable for 6 months. Do not refreeze.

Available in the Helix® on-site stocking system

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PowerPlex® Fusion System

Product	Size	Cat.#
PowerPlex® Fusion System	200 reactions	DC2402
	800 reactions	DC2408

Available Separately	Size	Conc.	Cat.#
2800M Control DNA	25 µl	10 ng/µl	DD7101
Water, Amplification Grade	6,250 µl		DW0991

Not For Medical Diagnostic Use.

Description: The PowerPlex® Fusion System is a 24-locus multiplex for human identification applications including forensic analysis, relationship testing and research use. This five-color system allows co-amplification and fluorescent detection of the 13 core CODIS (US) loci (CSF1PO, FGA, TH01, TPOX, vWA, D3S1358, D5S818, D7S820, D8S1179, D13S317, D16S539, D18S51 and D21S11), the 12 core European Standard Set loci (TH01, vWA, FGA, D21S11, D3S1358, D8S1179, D18S51, D10S1248, D22S1045, D2S441, D1S1656 and D12S391) and Amelogenin for gender determination. In addition, the male-specific DYS391 locus is included to identify null Y allele results for Amelogenin. The Penta D, Penta E, D2S1338 and D19S433 loci are included to increase discrimination and allow searching of databases that include profiles with these popular loci. This extended panel of STR markers is intended to satisfy both CODIS and ESS recommendations.

The PowerPlex® Fusion System works well with extracted DNA samples, including low amounts of template DNA, mixtures and inhibitor-laden samples. The PowerPlex® Fusion System also is compatible with direct amplification, enabling streamlined STR databasing efforts. Amplification can be successfully performed with sample types such as FTA® card punches as well as pretreated swabs, Bode Buccal DNA Collector™ punches or S&S 903 punches. Fast cycling conditions used with the PowerPlex® Fusion System reduce sample-processing time for all samples.

The PowerPlex® Fusion System is compatible with the ABI PRISM® 3100 and 3100-*Avant* Genetic Analyzers and Applied Biosystems® 3130, 3130*xl*, 3500 and 3500xL Genetic Analyzers.

Panels and bins text files are required for automatic assignment of genotypes using the GeneMapper® *ID* and *ID*-X software and are available for download at: **www.promega.com/resources/tools/genemapper-id-software-panels-and-bin-sets/**

The PowerPlex® Fusion System was given NDIS approval in March 2013 for NDIS CODIS databasing.

Features:

- **Highest Interdatabase Compatibility and Discrimination:** 24 loci (23 STRs plus Amelogenin), including the CODIS and ESS required loci. Amplifies all loci found in Identifiler®, SGM Plus® and PowerPlex® 16, some of the most commonly used multiplexes over the last decade.
- **Streamlined Workflows:** Direct-amplification protocols and rapid cycling.
- **Less Repeat Analysis of Difficult Samples:** High inhibitor tolerance and sensitivity for casework.
- **Easier Validation and QC:** One kit for both casework and database sections.

Storage Conditions: Store kit at –20°C. Upon receipt, move 2800M Control DNA to 4°C storage.

PowerPlex® Y23 System

Product	Size	Cat.#
PowerPlex® Y23 System	50 reactions	DC2305
	200 reactions	DC2320

Available Separately	Size	Conc.	Cat.#
2800M Control DNA	25 µl	10 ng/µl	DD7101
	500 µl	0.25 ng/µl	DD7251
Water, Amplification Grade	6,250 µl		DW0991

Not For Medical Diagnostic Use.

Description: The PowerPlex® Y23 System is a 23-loci, 5-color Y-STR multiplex designed for genotyping forensic casework samples, database samples and paternity samples.

The PowerPlex® Y23 System works well with extracted DNA samples, including low amounts of template and male/female DNA mixtures. The PowerPlex® Y23 System also is compatible with direct amplification, enabling streamlined Y-STR databasing efforts. Amplification can be successfully performed with sample types such as FTA® card punches as well as pretreated swabs, Bode Buccal DNA Collector™ punches or S&S 903 punches.

Faster cycling conditions cut amplification time almost in half. Moreover, reduced sample-processing time and faster cycling conditions provide a significant time savings in every run.

The PowerPlex® Y23 System is tolerant of many known amplification inhibitors. The robust performance of the kit results in more interpretable data from inhibitor-laden samples.

The PowerPlex® Y23 System was given NDIS approval in January 2013.

Features:

- **More Meaningful STR Analysis:** Higher power of discrimination from 23 loci results in fewer false-positive matches.
- **More Usable Profile from Samples with Excess Female DNA:** High sensitivity in the presence of female DNA (<0.1ng male DNA, 1:6,000 ratio).
- **Streamlined Databasing Workflows:** Direct-amplification compatible.
- **Significant Reduction in Amplification Time:** Faster cycling conditions cut amplification time roughly in half.
- **Full Profiles from Challenging Casework Samples:** High tolerance for inhibitors including tannic acid, hematin and humic acid.
- **Simplified Workflows and Inventory:** One kit for both casework and databasing.

Storage Conditions: Upon receipt of kit, remove 2800M Control DNA and store at 4°C. Store all other kit components at –20°C.

PowerPlex® 21 System

Product	Size	Cat.#
PowerPlex® 21 System	200 reactions	DC8902
	4 × 200 reactions	DC8942
Available Separately	**Size**	**Conc.**	**Cat.#**
Water, Amplification Grade	6,250 µl		DW0991
2800M Control DNA	25 µl	10 ng/µl	DD7101
	500 µl	0.25 ng/µl	DD7251

Not For Medical Diagnostic Use.

Description: The PowerPlex® 21 System is a multiplex STR system for human identification applications including forensic analysis, relationship testing and research use. The system allows co-amplification and fluorescent detection of 21 loci (20 STR loci and Amelogenin), including D1S1656, D2S1338, D3S1358, D5S818, D6S1043, D7S820, D8S1179, D12S391, D13S317, D16S539, D18S51, D19S433, D21S11, Amelogenin, CSF1PO, FGA, Penta D, Penta E, TH01, TPOX and vWA. The PowerPlex® 21 System is compatible with the ABI PRISM® 3100 and 3100-*Avant* Genetic Analyzers and Applied Biosystems® 3130, 3130*xl*, 3500 and 3500xL Genetic Analyzers.

Panels and bins text files are required for automatic assignment of genotypes using the GeneMapper® *ID* and *ID*-X software and are available for download at: **www.promega.com/resources/tools/genemapper-id-software-panels-and-bin-sets/**

Features:

- **Enjoy Maximum Discrimination:** 21 markers for difficult cases and complete data overlap with most existing multiplexes.
- **Save Labor and Time:** No need to wash FTA® card punches. Simpler protocols are available for swabs and nonFTA card punches as well.
- **Experience Higher Success Rates:** High inhibitor tolerance benefits challenging casework samples and results in less locus drop-out and reaction failure.
- **Shorten PCR Time:** 90-minute PCR increases laboratory productivity and decreases average turnaround time for your cases.

Storage Conditions: Store kit at –20°C. Upon receipt, remove 2800M Control DNA and store at 4°C.

PowerPlex® 18D System

Product	Size	Cat.#
PowerPlex® 18D System	200 reactions	DC1802
	800 reactions	DC1808
Available Separately	**Size**	**Conc.**	**Cat.#**
Water, Amplification Grade	6,250 µl		DW0991
2800M Control DNA	25 µl	10 ng/µl	DD7101

Not For Medical Diagnostic Use.

Description: The PowerPlex® 18D System is a multiplex STR system for use in database and paternity testing. This system is optimized for direct amplification of samples on FTA® cards. This five-color multiplex allows co-amplification of the 13 CODIS loci (D18S51, D21S11, TH01, D3S1358, FGA, TPOX, D8S1179, vWA, CSF1PO, D16S539, D7S820, D13S317, D5S818) plus Amelogenin, Penta E, Penta D, D2S1338 and D19S433. All eighteen loci are amplified simultaneously in a single tube and analyzed in a single injection. The PowerPlex® 18D System is compatible with ABI PRISM® 3100 and 3100-*Avant* Genetic Analyzers and Applied Biosystems® 3130, 3130*xl*, 3500 and 3500xL Genetic Analyzers.

The PowerPlex® 18D System was given NDIS approval in July 2011 for NDIS CODIS databasing.

Features:

- **Eliminate DNA Extraction:** Simplify and shorten sample processing with direct amplification from FTA® cards.
- **Reduce PCR Time:** Amplify in less than 1.5 hours using rapid cycling technology.
- **Upload More Markers:** Type D2S1338, D19S433, Penta D, Penta E, Amelogenin and the 13 CODIS loci with one kit.
- **Automatically Assign Genotypes:** Panels and bins text files are required for automatic assignment of genotypes using the GeneMapper® *ID* and *ID*-X software and are available for download at: **www.promega.com/resources/tools/genemapper-id-software-panels-and-bin-sets/**

Storage Conditions: Store kit at –20°C. Upon receipt, remove 2800M Control DNA and store at 4°C.

Available in the Helix® on-site stocking system

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PowerPlex® 16 HS System

Product	Size		Cat.#
PowerPlex® 16 HS System	100 reactions		DC2101
	400 reactions		DC2100
Available Separately	**Size**	**Conc.**	**Cat.#**
Internal Lane Standard 600	150 µl		DG1071
Water, Amplification Grade	6,250 µl		DW0991
2800M Control DNA	25 µl	10 ng/µl	DD7101
	500 µl	0.25 ng/µl	DD7251

DC2101, DC2100, DW0991, DD7101, DD7251 Not For Medical Diagnostic Use. DG1071 For Laboratory Use.

Description: The PowerPlex® 16 HS System is a multiplex STR system for use in DNA typing. This system co-amplifies the loci D18S51, D21S11, TH01, D3S1358, Penta E (labeled with fluorescein); FGA, TPOX, D8S1179, vWA and Amelogenin (labeled with TMR); CSF1PO, D16S539, D7S820, D13S317, D5S818 and Penta D (labeled with JOE). This multiplex includes all 13 CODIS STR markers, Amelogenin for gender determination and two low-stutter, highly discriminating pentanucleotide STR markers. All sixteen loci are amplified simultaneously in a single tube and analyzed in a single injection. The PowerPlex® 16 HS System is compatible with ABI PRISM® 310, 3100 and 3100-*Avant* Genetic Analyzers and Applied Biosystems® 3130, 3130*xl*, 3500 and 3500xL Genetic Analyzers.

Features:

- **Generate Profiles with Samples that Previously Failed to Amplify:** The PowerPlex® 16 HS System is more tolerant of PCR inhibitors than competing STR systems and the previous version of the PowerPlex® 16 System. Avoid costly and time-consuming sample cleanup.
- **Gain Confidence in Analysis of Limited Samples:** Each lot is quality tested to produce full profiles from 100pg of DNA.
- **Achieve High Discrimination:** The loci included in PowerPlex® 16 HS System are more discriminating than competitive systems and are ideal for resolving partial matches or challenging familial cases.
- **Expect Concordance with Existing Databases:** Primer sequences, dyes and ladders are all unchanged from the PowerPlex® 16 System.
- **Use a Complete System:** The PowerPlex® 16 HS System includes size standard, amplification-grade water and *Taq* DNA polymerase already in the master mix. Simple to order, easy to use.
- **Automatically Assign Genotypes:** Panels and bins text files are required for automatic assignment of genotypes using the GeneMapper® *ID* and *ID*-X software and are available for download at: **www.promega.com/resources/tools/genemapper-id-software-panels-and-bin-sets/**

Storage Conditions: Store at –20°C.

PowerPlex® CS7 System

Product	Size		Cat.#
PowerPlex® CS7 System	100 reactions		DC6613
Available Separately	**Size**	**Conc.**	**Cat.#**
Internal Lane Standard 600	150 µl		DG1071
Water, Amplification Grade	6,250 µl		DW0991
2800M Control DNA	25 µl	10 ng/µl	DD7101
	500 µl	0.25 ng/µl	DD7251

DC6613, DW0991, DD7101, DD7251 Not For Medical Diagnostic Use. DG1071 For Laboratory Use.

Description: The PowerPlex® CS7 System is a multiplex STR assay for relationship testing and human identification. The PowerPlex® CS7 System allows co-amplification and three-color detection of seven STR loci, including LPL, F13B, FESFPS, F13A01, Penta D, Penta C and Penta E. All seven loci are amplified simultaneously in a single tube and analyzed in a single injection. The PowerPlex® CS7 System contains two loci, Penta D and Penta E, that overlap with the loci included in the PowerPlex® 16, 16 HS, 18D, 21 and Fusion Systems. This feature allows the PowerPlex® CS7 System to be used as a confirmatory kit in paternity applications using the five unshared STR loci to supplement the genotype and increase the available information. The PowerPlex® CS7 System is compatible with the ABI PRISM® 3100 and 3100-*Avant* Genetic Analyzers and Applied Biosystems® 3130 and 3130*xl* Genetic Analyzers. The PowerPlex® CS7 System provides all materials necessary to amplify STR regions of purified genomic DNA.

Features:

- **More Loci:** Supplement current testing with LPL, F13B, FESFPS, F13A01 and Penta C for greater discrimination.
- **Confirmatory Loci:** Overlap of Penta D and Penta E in the PowerPlex® CS7 System and several PowerPlex® Systems allow detection of sample mixup when used together.
- **Complete:** Hot-start *Taq* DNA polymerase is provided in the master mix, and size standard is included.

Storage Conditions: Store at –20°C.

SwabSolution™ Kit, PunchSolution™ Kit and 5X AmpSolution™ Reagent

Product	Size	Cat.#
SwabSolution™ Kit	100 preps	DC8271
PunchSolution™ Kit	100 preps	DC9271
5X AmpSolution™ Reagent	100 preps	DM1231
Not For Medical Diagnostic Use.		

For additional information see page 252.

PowerPlex® 5C Matrix Standards

Product	Size	Cat.#
PowerPlex® 5C Matrix Standards, 310	50 µl	DG5640
PowerPlex® 5C Matrix Standard	5 preps	DG4850
Not For Medical Diagnostic Use.		

Description: The PowerPlex® 5C Matrix Standards allow the PowerPlex® ESX, ESI, 18D, 21, Y23 and Fusion Systems to be analyzed on the ABI PRISM® 310 Genetic Analyzer (Cat.# DG5640) and ABI PRISM® 3100 and 3100-Avant or Applied Biosystems® 3130, 3130*xl*, 3500 and 3500xL Genetic Analyzers (Cat.# DG4850).

Proper generation of a spectral calibration file is critical to evaluate multicolor systems. The PowerPlex® 5C Matrix Standards (Cat.# DG5640 and DG4850) contain matrix fragments labeled with five fluorescent dyes: Fluorescein, JOE, TMR-ET, CXR-ET and WEN. Once generated, the spectral calibration file is applied during collection of PowerPlex® data to calculate and compensate for spectral overlap between different fluorescent dye colors.

Storage Conditions: Store PowerPlex® 5C Matrix Standards, 310 (Cat.# DG5640), and PowerPlex® 5C Matrix Standard (Cat.# DG4850) at 4°C after first use. The matrix standards are light-sensitive; therefore, minimize light exposure.

PowerPlex® 4-Dye Matrix Standards

Product	Size	Cat.#
PowerPlex® Matrix Standards, 310	50 µl	DG4640
PowerPlex® 4C Matrix Standard	5 preps	DG4800
Not For Medical Diagnostic Use.		

Description: The PowerPlex® 4-Dye Matrix Standards allow the PowerPlex® 16, PowerPlex® 16 HS, PowerPlex® ES, PowerPlex® Y, PowerPlex® CS7, and PowerPlex® 16 and ES Monoplex Systems to be analyzed on the ABI PRISM® 310 Genetic Analyzer or ABI PRISM® 377 DNA Sequencer (Cat.# DG4640) and the ABI PRISM® 3100 and 3100-*Avant* or Applied Biosystems® 3130, 3130*xl*, 3500 and 3500xL Genetic Analyzers (Cat.# DG4800).

The PowerPlex® 4C Matrix Standard allows the PowerPlex® 16, PowerPlex® 16 HS, PowerPlex® S5, PowerPlex® CS7, PowerPlex® 16 and ES Monoplex Systems, MSI Analysis System and *GenePrint*® 10 System to be analyzed on the ABI PRISM® 3100 and 3100-*Avant* or Applied Biosystems® 3130, 3130*xl*, 3500 and 3500xL Genetic Analyzers.

Proper generation of a spectral calibration file is critical to evaluate multicolor systems. The PowerPlex® 4-Dye Matrix Standards contain matrix fragments labeled with four fluorescent dyes: Fluorescein, JOE, TMR and CXR. Once generated, the spectral calibration file is applied during collection of PowerPlex® data to calculate and compensate for spectral overlap between different fluorescent dye colors.

The PowerPlex® 4C Matrix Standard (Cat.# DG4800) replaces PowerPlex® Matrix Standards, 3100/3130 (Cat.# DG4650), and contains a single tube of mixed fluorescent dye-labeled matrix fragments.

Storage Conditions: Store the Matrix Standards, 310 (Cat.# DG4640), at –20°C. Store PowerPlex® 4C Matrix Standard (Cat.# DG4800) at 4°C after first use. The matrix standards are light-sensitive; therefore, minimize light exposure.

Available in the Helix® on-site stocking system

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WEN Internal Lane Standard 500 ESS

Product	Size	Cat.#
WEN Internal Lane Standard 500 ESS	200 µl	DG5101
Not For Medical Diagnostic Use.		

Description: The WEN Internal Lane Standard 500 ESS is designed for use with the PowerPlex® ESI 16 and 17 Fast, ESX 16 and 17 Fast and ESI 17 Pro Systems. The designation "ESS", or European Standard Set, indicates this ILS is for use with these PowerPlex® Systems. The standard contains 21 fragments ranging in size from 60bp to 500bp. Fragments of 60–200bp are spaced at 20bp intervals, except for the 65bp fragment. Fragments of 200–500bp are spaced every 25bp. Fragments that are muliples of 100bp have a higher intensity than the other fragments to simplify size assignment. The DNA fragments are double-stranded and asymmetrically labeled with a proprietary WEN dye. The WEN Internal Lane Standard 500 ESS is intended to be used in assigning sizes to DNA fragments separated by capillary electrophoresis and detected using a variety of fluorescence-detecting instruments.

Storage Conditions: Store at –30°C to +10°C. After first use, store at 2–10°C, protected from light.

WEN Internal Lane Standard 500 Y23

Product	Size	Cat.#
WEN Internal Lane Standard 500 Y23	200 µl	DG5201
Not For Medical Diagnostic Use.		

Description: The WEN Internal Lane Standard 500 Y23 is designed for use with the PowerPlex® Y23 System. The standard contains 21 fragments ranging in size from 60bp to 500bp. Fragments of 60–200bp are spaced at 20bp intervals, except for the 65bp fragment. Fragments of 200–500bp are spaced every 25bp. Fragments that are muliples of 100bp have a higher intensity than the other fragments to simplify size assignment. The DNA fragments are double-stranded and asymmetrically labeled with a proprietary WEN dye. The WEN Internal Lane Standard 500 Y23 is intended to be used in assigning sizes to DNA fragments separated by capillary electrophoresis and detected using a variety of fluorescence-detecting instruments.

Storage Conditions: Store at –30°C to +10°C. After first use of the system, store at 2–10°C, protected from light.

Internal Lane Standard 600

Product	Size	Cat.#
Internal Lane Standard 600	150 µl	DG1071
For Laboratory Use.		

Description: The Internal Lane Standard 600 (ILS 600) consists of 22 bands ranging in size from 60bp to 600bp. Fragments of 60–200bp are spaced at 20bp intervals, fragments of 200–500bp are spaced every 25 bases, and fragments of 500–600bp are spaced every 50 bases. Fragments that are multiples of 100 bases have fluorescence intensities approximately twice that of other fragments to simplify size assignment. The DNA ladder is double-stranded and asymmetrically labeled with carboxy-X-rhodamine (CXR). The Internal Lane Standard 600 is used to assign sizes to DNA fragments separated by electrophoresis and detected using a variety of fluorescence-detection instruments (e.g., Hitachi FMBIO® Fluorescence Imaging System and ABI PRISM® 310, 3100, 3100-*Avant* and Applied Biosystems® 3130, 3130*xl*, 3500 and 3500xL Genetic Analyzers). ILS 600 is commonly used as an internal size marker for other applications and can be visualized by detecting fluorescent emission at 597nm after excitation at 576nm.

In addition, the Internal Lane Standard 600 contains additives that prevent the formation of two artifacts ("split peak" and "n–10") at the vWA locus in the PowerPlex® 16 and 16 HS Systems when using ABI PRISM® 3100, 3100-*Avant* and Applied Biosystems® 3130 and 3130*xl* Genetic Analyzers.

Storage Conditions: Store at –20°C. Avoid multiple freeze-thaw cycles or exposure to frequent temperature changes. These fluctuations can greatly alter product stability. The Internal Lane Standard 600 is light-sensitive; therefore, minimize light exposure.

2800M Control DNA

Product	Size	Conc.	Cat.#
2800M Control DNA	25 µl	10 ng/µl	DD7101
	500 µl	0.25 ng/µl	DD7251
Not For Medical Diagnostic Use.			

Description: The 2800M Control DNA is a single-source male human genomic DNA. This DNA can be used as a control for human STR analysis.

Storage Conditions: Store at 2–10°C.

VersaPlex™ 27PY System

Product	Size	Cat.#
VersaPlex™ 27PY System	200 reactions	DC7020
Available Separately		
VersaPlex™ 6C Matrix Standard	5 preps	DG4960
Not for Medical Diagnostic Use. Product may not be available in all countries. Please contact your local representative for more information.		

Description: Not for Medical Diagnostic Use. Product may not be available in all countries. Please contact your local representative for more information.

Short tandem repeat (STR) loci are well distributed throughout the human genome and can be detected using the polymerase chain reaction (PCR). Alleles of STR loci are differentiated by the number of copies of the repeat sequence contained within the amplified region. They can be distinguished from one another using fluorescence detection following electrophoretic separation.

The VersaPlex™ 27PY System is a 6-color, 27-loci multiplex STR amplification system capable of rapid cycling. In addition to the D6S1043 locus, the kit includes: CSF1PO, FGA, TH01, TPOX, vWA, D1S1656, D2S441, D2S1338, D3S1358, D5S818, D7S820, D8S1179, D10S1248, D12S391, D13S317, D16S539, D18S51, D19S433, D21S11, D22S1045, Penta D, Penta E, DYS391, DYS570, DYS576 and Amelogenin.

Features:

- Improved results from challenging samples helps save time and reduce costs by minimizing the need to repeat assays
- Designed for forensic casework and paternity determination
- Rapid cycling capabilities reduce processing time for all samples

Storage Conditions: Store at –30°C to –10°C.

Available in the Helix® on-site stocking system

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Massively Parallel Sequencing

PowerSeq™ Quant MS System

Product	Size	Cat.#
PowerSeq™ Quant MS System	500 reactions	PS5000
Not For Medical Diagnostic Use.		

Description: The PowerSeq™ Quant MS System is a qPCR-based system designed for library quantification within the MPS workflow by directly measuring the number of DNA molecules present in libraries. Accurate quantification of a library determines the optimal amount of adapter ligated fragments for cluster generation and ensures even representation of each library on the chip.

Features:

- Enables normalization of MPS libraries based on DNA quantification
- Uses BRYT Green® dye-based qPCR system for maximum sensitivity and reproducibility
- Enables accurate and balanced multiplexed Illumina pooled libraries

Storage Conditions: Store at –30°C to –10°C in a nonfrost-free freezer protected from light.

PowerSeq™ CRM Nested System, Custom

Product	Size	Cat.#
PowerSeq™ CRM Nested System, Custom	1 each	AX5810
Not For Medical Diagnostic Use.		

Description: Massively parallel sequencing (MPS) allows laboratories access to mitochondrial DNA (mtDNA) analysis using a more sensitive and high-throughput workflow compared to traditional sequencing methods. Increased mixture deconvolution and heteroplasmy resolution are achieved by deep sequencing coverage and digital read counts. Additionally, the use of small amplicons to sequence the mitochondrial control region improves sequencing results from degraded samples.

The PowerSeq™ CRM Nested System, Custom, generates 10 small amplicons covering the control region of the mitochondrial genome in one multiplex. The targeted regions for amplification are designed to be in a range of 144–237bp to ensure optimal results from degraded samples. The system uses a nested amplification protocol that greatly reduces the number of steps and time required to produce libraries ready for sequencing. The protocol consists of a single PCR step to both amplify the target amplicons and incorporate indexed sequencing adapters.

Features:

- Massively parallel sequencing of mitochondrial HVI, HVII and HVIII control regions in a single reaction
- Nested amplification protocol greatly reduces number of steps and time required for library preparation
- Small amplicons ranging from 144–237bp for better results with compromised samples

Storage Conditions: Store at –30°C to –10°C.

Consumables for DNA Extraction in PCR, qPCR and CE Applications

Product	Size	Cat.#
Septa Mat, 96-Well	10 each	CE2696
Optical Plate Seals	100 each	V7840
Strip Cap, 8-Well	120 each	V7850
Not For Medical Diagnostic Use.		

Description: Our plastic consumables provide excellent performance at a good value. These PCR plastics and consumables support DNA extraction, quantification, amplification and capillary electrophoresis of DNA. The PCR plastics and consumables are made for a variety of thermal cyclers, real-time PCR systems and CE instrumentation.

Optical Plate Seals are used for sealing microplates to prevent evaporation and contamination in real-time PCR; they are compatible with real-time PCR systems such as the Applied Biosystems 7500 Real-Time System.

Strip Caps are eight-strip domed caps for PCR plates and tubes to prevent evaporation and contamination in PCR.

Septa Mats are used for sealing 96-well plates in capillary electrophoresis; they are compatible with Spectrum CE System and ABI Sequencers and Genetic Analyzers.

Features:

- PCR plastics and consumables made for a variety of thermal cyclers, real-time PCR systems and CE instrumentation.

Storage Conditions: Store all consumables at 15–30°C.

Promega

Biochemicals and Labware

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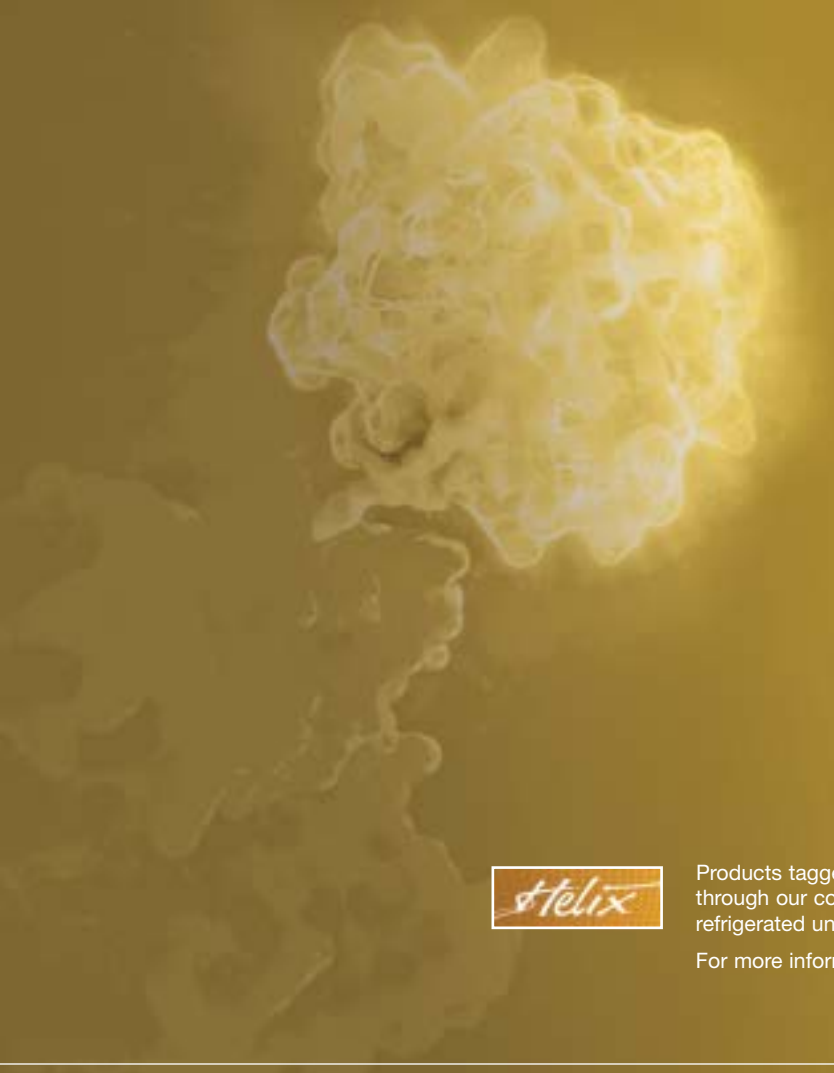
Biochemicals and Labware



Products tagged with the Helix® icon are available for distribution through our convenient on-site stocking program in a freezer, refrigerated unit or an ambient cabinet.

For more information visit: **www.promega.com/helix**

Available in the Helix® on-site stocking system

Biochemical Buffers and Reagents

4-CORE® Buffer Pack

Product	Size	Cat.#
4-CORE® Buffer Pack (Buffers A, B, C and D), 1ml each	4 ml	R9921

For Research Use Only. Not for Use in Diagnostic Procedures.

For additional information see page 114.

5M Sodium Chloride, Molecular Biology Grade

Product	Size	Conc.	Cat.#
5M Sodium Chloride, Molecular Biology Grade	1 L	5 M	V4221

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: 5M Sodium Chloride is commonly used in many molecular biology and forensic applications.

Form: Clear, colorless liquid.

Composition: 292.2g/L NaCl in deionized water.

Properties:

- pH at 25°C (1M): 5.0–8.0.
- A_{260} at 5M: ≤0.02.
- A_{280} at 5M: ≤0.01.
- Conductivity at 25°C (0.05M): 5,000–7,000µSm.

Features:

- **Quality Tested:** Each lot of NaCl is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at +15°C to +30°C.

Acrylamide, Molecular Grade

Product	Size	Cat.#
Acrylamide, Molecular Grade	100 g	V3111
	500 g	V3115

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Acrylamide, Molecular Grade, is used for the electrophoretic separation of nucleic acids and proteins. Very small DNA fragments, such as those generated by sequencing reactions, can be resolved by polyacrylamide gel electrophoresis. Proteins can be separated by a variety of techniques, including denaturing gel electrophoresis using SDS or urea, isoelectric focusing and native gel electrophoresis in a wide variety of buffers.

Formula Weight: 71.08.

Form: White, free-flowing crystals.

Properties:

- **Purity:** ≥99.9%.
- **Melting Point:** 84–86°C.
- **Free Acrylic Acid:** <0.001%.
- **Iron:** ≤1ppm.
- **Lead:** ≤1ppm.
- **pH (10% in 0.1M NaCl at 25°C):** 6.0–7.0.
- **Conductivity (40% in water):** ≤2.5µmhos.

Features:

- **Quality Tested:** Each lot of Molecular Grade Acrylamide is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at +15°C to +30°C. Protect from moisture.

Agarose, LE, Analytical Grade

Product	Size	Cat.#
Agarose, LE, Analytical Grade	100 g	V3121
	500 g	V3125

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Agarose, LE, Analytical Grade, is used for the electrophoretic separation of nucleic acids.

Form: White powder.

Properties:

- **Gel Strength (1%):** ≥1,000g/cm^2.
- **Gelling Point (1.5%):** 36–39°C.
- **Melting Point (1.5%):** 87–89°C.
- **EEO (–mr):** 0.09–0.13.
- **Sulfate:** ≤0.14%.
- **Moisture:** ≤7.0%.

Features:

- **Quality Tested:** Each lot of Analytical Grade LE Agarose is tested and certified to be free of DNase and RNase activity.

Storage Conditions: Store at +15°C to +30°C.

Agarose, LMP, Preparative Grade for Large Fragments (>1,000bp)

Product	Size	Cat.#
Agarose, LMP, Preparative Grade for Large Fragments (>1,000bp)	25 g	V2831

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Agarose, LMP, Preparative Grade for Large Fragments (>1,000bp), is a premium agarose used for isolating DNA fragments larger than 1,000bp. Each lot is tested and certified for the following applications: 1) restriction digestion, 2) ligation and transformation, and 3) random prime labeling. LMP = low melting point (i.e., ≤65°C).

Form: White powder.

Properties:

- **Gelling Point (1.5%):** 26–30°C.
- **Melting Point (1.5%):** ≤65°C.
- **Sulfate:** ≤0.10%.
- **EEO (–mr):** ≤0.10.
- **Moisture:** ≤10%.
- **Gel Strength (1%):** ≥200g/cm^2.

Features:

- **Quality Tested:** Each lot of Preparative Grade LMP Agarose is tested and certified to be free of DNase and RNase activity.

Storage Conditions: Store at +15°C to +30°C.

Agarose, LMP, Preparative Grade for Small Fragments (10 to 1,000bp)

Product	Size	Cat.#
Agarose, LMP, Preparative Grade for Small Fragments (10 to 1,000bp)	25 g	V3841
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Agarose, LMP, Preparative Grade for Small Fragments (10 to 1,000bp), is a premium agarose used for isolating DNA fragments from 10 to 1,000bp. The isolated DNA fragments can be used in various molecular biology applications: 1) restriction digestion, 2) ligation and transformation, and 3) random prime labeling. LMP = low melting point (i.e., ≤65°C).

Form: White powder.

Properties:

- **Gelling Point (4%):** ≤35°C.
- **Melting Point (4%):** ≤65°C.
- **Sulfate:** ≤0.15%.
- **EEO (–mr):** ≤0.15.
- **Moisture:** ≤10%.
- **Gel Strength:** ≥500g/cm^2.

Features:

- **Quality Tested:** Each lot of Preparative Grade LMP Agarose is tested and certified to be free of DNase and RNase activity.

Storage Conditions: Store at +15°C to +30°C.

Agarose, Low Melting Point, Analytical Grade

Product	Size	Cat.#
Agarose, Low Melting Point, Analytical Grade	25 g	V2111
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Agarose, Low Melting Point, Analytical Grade, is ideal for applications that require recovery of intact DNA fragments after gel electrophoresis.

Form: White powder.

Properties:

- **Gelling Point (1.5%):** 24–28°C.
- **Melting Point (1.5%):** ≤65.5°C.
- **Sulfate:** ≤0.12%.
- **EEO (–mr):** ≤0.11.
- **Gel Strength (1%):** ≥300g/cm^2.

Features:

- **Quality Tested:** Each lot of Analytical Grade LMP Agarose is tested and certified to be free of DNase and RNase activity.

Storage Conditions: Store at +15°C to +30°C.

Ammonium Sulfate, Molecular Biology Grade

Product	Size	Cat.#
Ammonium Sulfate, Molecular Biology Grade	5 kg	H5252
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Ammonium Sulfate, Molecular Biology Grade, is a salt used in the purification of enzymes and other proteins by precipitation.

Formula Weight: 132.13.

Properties:

- **Purity:** ≥99.0%.
- **Chloride:** ≤5ppm.
- **Copper:** ≤5ppm.
- **Iron:** ≤5ppm.
- **Zinc:** ≤5ppm.
- **Lead:** ≤5ppm.
- **pH at 25°C (1M):** 5.0–6.0.
- **A_{260} at 1M:** ≤0.03.
- **A_{280} at 1M:** ≤0.03.

Features:

- **Quality Tested:** Each lot of Ammonium Sulfate is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at +15°C to +30°C.

Available in the Helix® on-site stocking system

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Antibiotic G-418 Sulfate

Product	Size	Cat.#
Antibiotic G-418 Sulfate	5 g	V7983
Antibiotic G-418 Sulfate Solution	20 ml	V8091

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Antibiotic G-418 Sulfate is an aminoglycosidic antibiotic toxic to both prokaryotic and eukaryotic cells. It acts by interfering with protein synthesis and is used as an agent for selection of cultured cells expressing a gene (i.e., aminoglycoside 3´ phosphotransferase [APH 3']) that confers resistance to G-418. The liquid form of the product is in distilled water and aseptically filtered.

Formula Weight: 692.6 (anhydrous).

Form: White powder.

Physical/Chemical Properties of Powder:

- **Appearance:** White powder.
- **TLC:** Single major spot.
- **Elemental Analysis:** %C = 28.8–36.07; %H = 5.76–7.76; %N = 6.72–8.41.
- **Absorbance:** A_{280} (1mg/ml) = 0–0.015; A_{570} (100mg/ml) = 0–0.1.
- **Specific Rotation:** +104° to +121°.

Properties Specific to V7983:

- **Appearance:** White powder.
- **Hydration Waters:** 0–6, as determined from Elemental Analysis.
- **Potency:** ≥700µg/mg.

Properties Specific to V8091:

- **Potency:** 40–60mg/ml.
- **Sterility:** Aseptically filtered.

Features:

- **Sterility:** Antibiotic G-418 Sulfate liquid requires sterilization.

Storage Conditions: Store at +15°C to +30°C.

BCIP/NBT Color Development Substrate (5-bromo-4-chloro-3-indolyl-phosphate/nitro blue tetrazolium)

Product	Size	Cat.#
BCIP/NBT Color Development Substrate	1.25/2.5 ml	S3771

For Laboratory Use.

Description: BCIP (5-bromo-4-chloro-3-indolyl-phosphate) is used in conjunction with NBT (nitro blue tetrazolium) for the colorimetric detection of alkaline phosphatase activity. Each vial of BCIP is supplied with a vial of NBT.

Preparation of Substrates to Detect Alkaline Phosphatase: For every 5ml of alkaline phosphatase buffer (100mM Tris-HCl [pH 9.0], 150mM NaCl, 1mM $MgCl_2$), add 33µl NBT and 16.5µl BCIP. Add the NBT first, mix, add the BCIP, and mix again. Use within 1 hour, and discard any unused solution.

Concentration: BCIP (50mg/ml) in 100% dimethylformamide; NBT (50mg/ml) in 70% dimethylformamide.

Features:

- **Quality Tested:** Each lot of BCIP/NBT Color Development Substrate is tested and qualified for use in blotting.

Storage Conditions: Store at either 4°C or –20°C.

Beetle Luciferin, Potassium Salt

Product	Size	Cat.#
Beetle Luciferin, Potassium Salt	5 mg	E1601
	50 mg	E1602
	250 mg	E1603
	1 g	E1605

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Luciferase genes from the North American firefly (*Photinus pyralis*) and from other beetles are commonly used as reporter genes for studying transcription regulation in transient assay systems and as markers for stably transformed eukaryotic cells. Beetle luciferin (also known as D-luciferin) is synthesized as the monopotassium salt and is a substrate for the beetle luciferase reporter systems. D-luciferin is provided for those researchers who prefer to formulate their own assay reagents for monitoring in vitro or in vivo luciferase activity.

Formula: $C_{11}H_7N_2O_3S_2{\bullet}K$.

Formula Weight: 318.4 (anhydrous).

Features:

- **Formulation:** Supplied as a potassium salt for easy preparation in aqueous buffer.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –70°C.

Bisacrylamide, Molecular Grade (N,N´-Methylenebisacrylamide)

Product	Size	Cat.#
Bisacrylamide, Molecular Grade	25 g	V3141
	125 g	V3143

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Bisacrylamide, Molecular Grade, is a cross-linking agent used in the preparation of polyacrylamide gels. This product is tested for its efficiency in gel polymerization.

Formula Weight: 154.20.

Form: White, free-flowing crystals.

Properties:

- **Purity:** ≥99.0%.
- **Acrylic Acid (CH_2:CHCOOH):** ≤0.001%.
- **A_{290} (1% solution):** ≤0.20.
- **Magnesium:** ≤2ppm.
- **Conductivity (2% in water):** ≤10µmhos.

Features:

- **Quality Tested:** Each lot of Bisacrylamide is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at +15°C to +30°C.

Blue/Orange Loading Dye, 6X

Product	Size	Cat.#
Blue/Orange Loading Dye, 6X	3 ml	G1881

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Blue/Orange Loading Dye, 6X, is a convenient marker dye containing 0.4% orange G, 0.03% bromophenol blue, 0.03% xylene cyanol FF, 15% Ficoll® 400, 10mM Tris-HCl (pH 7.5) and 50mM EDTA (pH 8.0). It is provided in a premixed, ready-to-use form. The dye is used for loading DNA samples into gel electrophoresis wells and tracking migration during electrophoresis. In a 0.5–1.4% agarose gel in 0.5X TBE, xylene cyanol FF migrates at approximately 4kb, bromophenol blue at approximately 300bp and orange G at approximately 50bp.

Features:

- **Quality Tested:** Each lot of Blue/Orange Loading Dye, 6X, is tested and certified to be free of nuclease activity.

Storage Conditions: Store at –20°C.

Boric Acid, Molecular Biology Grade (orthoboric acid)

Product	Size	Cat.#
Boric Acid, Molecular Biology Grade	500 g	H5001
	1 kg	H5003

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Boric Acid, Molecular Biology Grade, in conjunction with Tris, is commonly used in buffers for the preparation of agarose or acrylamide gels and their associated running buffers.

Formula Weight: 61.84.

Properties:

- **Purity:** ≥99.5%.
- **Iron:** ≤5ppm.
- **Lead:** ≤5ppm.
- **Moisture:** ≤0.5%.
- **A_{260} at 1M:** ≤0.015.
- **A_{280} at 1M:** ≤0.010.

Features:

- **Quality Tested:** Each lot of Boric Acid is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at +15°C to +30°C.

Bovine Serum Albumin, Acetylated

Product	Size	Conc.	Cat.#
Bovine Serum Albumin, Acetylated	1 ml	10 mg/ml	R3961
	400 µl	1 µg/µl	R9461

R3961 For Laboratory Use.
R9461 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Bovine Serum Albumin, Acetylated, can be used as an enzyme stabilizer or as a carrier protein. It is prepared by a modification of the method of Gonzalez *et al.* and dialyzed extensively with deionized water to remove impurities.

Features:

- **Quality Tested:** Each lot of BSA is tested and certified to be free of DNase and RNase activity.

Storage Conditions: Store at –20°C.

Coelenterazines

Product	Size	Cat.#
Coelenterazine	250 µg	S2001
Coelenterazine-h	250 µg	S2011

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Luciferases from *Renilla*, *Aequorea* and other marine organisms are commonly used as indicators or reporters for studying cellular phenomena in expression assays in eukaryotic cells. *Renilla* luciferase is often used as a reporter of transcription regulation, whereas apoaequorin is often used as a calcium indicator. Other uses of coelenterazines include chemiluminescent detection of Reactive Oxygen Species (ROS) in cells or tissues. Promega offers the following coelenterazine analogs.

Coelenterazine (native) is the luminescent substrate for *Renilla* luciferase and apoaequorin. **Formula:** $C_{26}H_{21}N_3O_3$. **Formula Weight:** 423.5. **Form:** Film.

Coelenterazine-h imparts a luminescent intensity with its aequorin complex that is reported to be 10–20 times higher than that of native coelenterazine, making this derivative a useful tool for measuring small changes in Ca^{2+} concentrations. **Formula:** $C_{26}H_{21}N_3O_2$. **Formula Weight:** 407.5. **Form:** Film.

Features:

- **Highly Pure:** 95%.
- **Custom Capabilities:** Custom packaging and sizes available.
- **Easy to Prepare:** Supplied as a dried substrate for easy preparation in methanol or ethanol.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –20°C.

Diamond™ Nucleic Acid Dye

Product	Size	Cat.#
Diamond™ Nucleic Acid Dye	500 µl	H1181

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Diamond™ Nucleic Acid Dye is a sensitive fluorescent dye that binds to single-stranded DNA, double-stranded DNA and RNA, and can be used to stain and visualize nucleic acids in gels. Diamond™ Nucleic Acid Dye is compatible with denaturing and native agarose and polyacrylamide gels and can be imaged with any standard imaging system, such as by UV transillumination with a Polaroid® or digital camera, GE ImageQuant™ or Bio-Rad Gel Doc™ systems.

The concentrated dye is stable for up to 90 days at room temperature. Diamond™ Nucleic Acid Dye does not require prewashing or destaining of gels. It is more much more sensitive than ethidium bromide, so less sample nucleic acid and nucleic acid markers are required for visualization, resulting in increased savings with every gel you run.

Features:

- **Sensitive:** Sensitive detection of small amounts of nucleic acids.
- **Room-Temperature Stable:** Convenient storage allows quick and easy use—no thawing necessary.
- **Flexible:** Compatible with a variety of common gel types and imaging equipment.

Storage Conditions: Store at room temperature (22–25°C) for up to 90 days. Store at –20°C for long-term storage.

Available in the Helix® on-site stocking system

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Available in the Helix® on-site stocking system

DTT, Molecular Grade (DL-Dithiothreitol)

Product	Size	Conc.	Cat.#
DTT, Molecular Grade	100 µl	100 mM	P1171
DTT, Molecular Grade (Dry Powder)	5 g		V3151
	25 g		V3155

P1171 For Laboratory Use.
V3151, V3155 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: DTT, Molecular Grade, is an antioxidant used to stabilize enzymes and other proteins containing sulfhydryl groups. The liquid form of the product is a 100mM solution of DTT in water.

Formula: $C_4H_{10}O_2S_2$.

Formula Weight: 154.25.

Form: White crystals/powder or liquid in deionized water.

Physical/Chemical Properties of Powder:

- **Purity:** ≥99.0%.
- **Melting Point:** 40–44°C.
- **A_{283} at 20mM:** ≤0.04.
- **% Oxidized:** ≤0.50%.

Features:

- **Quality Tested:** Each lot of DTT is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at –30°C to –10°C.

EDTA, 0.5M (pH 8.0), Molecular Biology Grade

Product	Size	Cat.#
EDTA, 0.5M (pH 8.0), Molecular Biology Grade	100 ml	V4231
	400 ml	V4233

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: EDTA, 0.5M (pH 8.0), Molecular Biology Grade, is a chelator of divalent cations and is suitable for biochemistry and molecular biology applications. It is supplied as a solution in deionized water.

Form: Clear, colorless liquid.

Properties:

- **pH at 25°C:** 7.9–8.1.
- **A_{280} at 0.5M:** ≤0.25.
- **RNase Activity at 0.5M:** ≤1.0% release of ^{3}H-RNA.
- **DNase Activity at 0.5M:** ≤1.0% release of ^{3}H-DNA.
- **Protease Assay:** None detected.

Storage Conditions: Store at +15°C to +30°C.

EDTA, Disodium Salt (Dihydrate), Molecular Biology Grade

Product	Size	Cat.#
EDTA, Disodium Salt, Molecular Biology Grade	100 g	H5031
	500 g	H5032

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: EDTA, Disodium Salt, Molecular Biology Grade, is a chelator of divalent metal cations.

Formula Weight: 372.20.

Properties:

- **Purity:** ≥99.0%.
- **Insolubles:** ≤0.005%.
- **Lead:** ≤5ppm.
- **Iron:** ≤10ppm.

Features:

- **Quality Tested:** Each lot of EDTA is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at +15°C to +30°C.

Ethidium Bromide Solution, Molecular Grade

Product	Size	Conc.	Cat.#
Ethidium Bromide Solution, Molecular Grade	10 ml	10 mg/ml	H5041

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Ethidium Bromide Solution, Molecular Grade (10mg/ml), is a fluorescent dye suitable for staining nucleic acids after electrophoresis or in cesium chloride gradients. The solution can be used to detect both double-stranded and single-stranded DNA.

Features:

- **Quality Tested:** Each lot of Ethidium Bromide Solution is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at +15°C to +30°C.

Formamide, Molecular Grade

Product	Size	Cat.#
Formamide, Molecular Grade	100 ml	H5051
	500 ml	H5052

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Formamide is often used for the denaturation of nucleic acids in applications such as hybridization, sequencing gel electrophoresis and electron microscopy.

Formula Weight: 45.04.

Properties:

- **Purity:** ≥99.5%.
- **Copper:** ≤1ppm.
- **Iron:** ≤1ppm.
- **Lead:** ≤1ppm.
- **Zinc:** ≤1ppm.
- **Refractive Index at 20°C:** 1.446–1.448.
- **pH at 25°C of 1%:** 6.5–7.5.
- **A_{260} at 10%:** ≤0.10.
- **A_{280} at 10%:** ≤0.02.

Features:

- **Quality Tested:** Each lot of Formamide is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at +15°C to +30°C.

Glycerol, Molecular Biology Grade

Product	Size	Cat.#
Glycerol, Molecular Biology Grade	1,000 ml	H5433

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Glycerol is used for storage of enzymes at low temperatures. A 50% (w/v) glycerol solution will not freeze at –20°C. Glycerol is often used as a component in electrophoresis loading buffers because of its density (1.26g/ml). In addition, glycerol gradients can be used in the purification of bacteriophage or proteins. Cat.# H5433 is anhydrous glycerol with a purity of ≥99.5%.

Properties:

- **Purity:** ≥99.5%.
- **Calcium:** ≤2ppm.
- **Magnesium:** ≤1ppm.
- **Lead:** ≤5ppm.
- **Zinc:** ≤1ppm.
- **A_{260} at 10%:** ≤0.05.
- **A_{280} at 10%:** ≤0.05.

Features:

- **Quality Tested:** Each lot of glycerol is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at +15°C to +30°C.

Glycine, Molecular Biology Grade

Product	Size	Cat.#
Glycine, Molecular Biology Grade	500 g	H5071
	1 kg	H5073

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Glycine is an amino acid used in the preparation of some electrophoresis buffers.

Formula Weight: 75.07.

Properties:

- **Purity:** ≥99.0%.
- **Iron:** ≤10ppm.
- **A_{260} at 1M:** ≤0.05.
- **A_{280} at 1M:** ≤0.05.

Features:

- **Quality Tested:** Each lot of Glycine is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at +15°C to +30°C.

Guanidine Thiocyanate, Molecular Grade (Guanidinium Thiocyanate)

Product	Size	Cat.#
Guanidine Thiocyanate, Molecular Grade	100 g	V2791

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Guanidine Thiocyanate, Molecular Grade, at high concentrations, is a protein denaturant used most commonly for the isolation of intact RNA due to its ability to inhibit RNase.

Formula Weight: 118.16.

Form: White, crystalline powder.

Properties:

- **Purity:** ≥99.0%.
- **Insolubles:** None.
- **A_{280} at 6M:** ≤0.8.
- **A_{300} at 6M:** ≤0.1.
- **A_{320} at 6M:** ≤0.1.
- **A_{410} at 6M:** ≤0.1.
- **Moisture:** ≤1%.
- **Melting Point:** 118–121°C.
- **Potassium:** ≤50ppm.
- **Sodium:** ≤0.5%.
- **Zinc:** ≤1.5ppm.
- **Copper:** ≤0.5ppm.
- **Barium:** ≤3ppm.
- **Iron:** ≤5ppm.

Features:

- **Quality Tested:** Each lot of Guanidine Thiocyanate is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at +15°C to +30°C.

Available in the Helix® on-site stocking system

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Guanidine-HCl, Molecular Biology Grade (Guanidinium Hydrochloride)

Product	Size	Cat.#
Guanidine-HCl, Molecular Biology Grade	100 g	H5381
	500 g	H5383

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Guanidine-HCl, Molecular Grade, is commonly used for the isolation of intact mRNA from tissues or cultured cells.

Formula Weight: 95.53.

Form: Fine, colorless or white crystals.

Properties:

- **Purity:** ≥99.5%.
- **A_{230} at 6M:** ≤0.15.
- **A_{260} at 6M:** ≤0.03.
- **A_{280} at 6M:** ≤0.02.
- **Moisture:** ≤0.3%.
- **Melting Point:** 186–188°C.
- **Lead:** ≤5ppm.
- **Zinc:** ≤1ppm.
- **Copper:** ≤1ppm.
- **Iron:** ≤5ppm.

Features:

- **Quality Tested:** Each lot of Guanidine-HCl is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at +15°C to +30°C.

HEPES, Molecular Biology Grade (free acid)

Product	Size	Cat.#
HEPES, Molecular Biology Grade (free acid)	100 g	H5302
	500 g	H5303

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: HEPES is a biological buffer that functions over a pH range of 6.8 to 8.2.

Formula Weight: 238.3.

Properties:

- **Appearance:** White, crystalline powder.
- **Purity:** ≥99.5%.
- **Lead:** ≤5ppm.
- **Iron:** ≤5ppm.
- **Moisture:** ≤0.5%.
- **pH at 25°C (1M):** 5.0–6.5.
- **A_{260} at 0.1M:** ≤0.05.
- **A_{280} at 0.1M:** ≤0.04.

Features:

- **Quality Tested:** Each lot of HEPES is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at +15°C to +30°C.

IPTG, Dioxane-Free

Product	Size	Cat.#
IPTG, Dioxane-Free	1 g	V3955
	5 g	V3951
	50 g	V3953

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: IPTG, Dioxane-Free (isopropyl-β-D-thiogalactopyranoside), is an inducer of β-galactosidase activity in many bacteria. Functioning as a *lac* analog, IPTG induces β-galactosidase activity by binding to and inhibiting the *lac* repressor. This product is used to differentiate recombinants from nonrecombinants in cloning strategies using vectors containing the *lacZ* or *lacZ* α-peptide gene.

Formula Weight: 238.31.

Form: White powder.

Properties:

- **Purity:** ≥99.0%.
- **Moisture:** ≤1%.
- **pH (5%, H_2O):** 5–7.
- **Dioxane Content:** ≤10ppm.

Storage Conditions: Store dry at –30°C to +10°C.

Luciferin-EF™ Endotoxin-Free Luciferin Na

Product	Size	Cat.#
Luciferin-EF™	25 mg	E6551
	250 mg	E6552

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Luciferin-EF™ is an endotoxin-free beetle luciferin that can be used for cell-based imaging applications in living systems, where endotoxin may create problems. Luciferin-EF™ is tested to ensure endotoxin is below detectable levels and packaged in amber vials with septa to facilitate easy dilution and use.

Features:

- **Achieve Endotoxin Levels Below Detection Limits:** No potential interference in assay due to the presence of endotoxins.
- **Be Assured of Product Integrity:** Luciferin-EF™ is packaged in amber vials with septa to ensure product integrity as well as offer ease of dilution and use for imaging experiments.
- **Appreciate Flexibility and Convenience:** Luciferin-EF™ is available in two sizes, depending on the number of experiments to be performed.

Storage Conditions: Store at –70°C.

L-Rhamnose Monohydrate

Product	Size	Cat.#
L-Rhamnose Monohydrate	10 g	L5701
	50 g	L5702

For Research Use Only. Not for Use in Diagnostic Procedures.

For additional information see page 330.

MOPS/EDTA Buffer

Product	Size	Cat.#
MOPS/EDTA Buffer	3 × 10 ml	Y5101

For Research Use Only. Not for Use in Diagnostic Procedures.

For additional information see page 191.

MULTI-CORE™ Buffer Pack

Product	Size	Cat.#
MULTI-CORE™ Buffer Pack	3 × 1 ml	R9991

For Research Use Only. Not for Use in Diagnostic Procedures.

For additional information see page 114.

Nuclease-Free Water

Product	Size	Cat.#
Nuclease-Free Water	50 ml	P1193
	150 ml	P1195
	500 ml	P1197
	1,000 ml	P1199

P1193 For Laboratory Use.
P1195, P1197, P1199 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Nuclease-Free Water is an essential component of molecular biology experiments.

Features:

- **Quality Tested:** Each lot of Nuclease-Free Water is tested and certified to be free of DNase and RNase activity.

Storage Conditions: Store at <30°C.

PEG 8000, Molecular Biology Grade (Polyethylene Glycol 8000)

Product	Size	Cat.#
PEG 8000 Powder, Molecular Biology Grade	500 g	V3011

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: PEG 8000 is used in the precipitation of phage, isolation of plasmid DNA and the enhancement of blunt-ended ligation reactions.

Formula Weight: 7,000–9,000.

Form: White, waxy crystalline flakes.

Properties:

- **Purity:** ≥99.0%.
- **pH at 25°C (5% water):** 5.0–7.0.

Features:

- **Quality Tested:** Each lot of PEG 8000 is tested and certified to be free of DNase and RNase activity.

Storage Conditions: Store at +15°C to +30°C.

Protease Inhibitor Cocktail

Product	Size	Cat.#
Protease Inhibitor Cocktail, 50X	1 ml	G6521

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Protease Inhibitor Cocktail is used to prevent protein degradation after lysing cells. The product is a mixture of six different protease inhibitors with different target protease specificities. The inhibitor cocktail is EDTA-free and provided as a powder, ready for reconstitution in 1ml of either 100% ethanol or DMSO to obtain a 50X working solution.

Features:

- **Broad Specificity:** Inhibitor cocktail is effective against a diverse number of proteases.
- **Great Potency:** Reagent provides the best-in-class level of protease inhibition.
- **Highly Compatible:** Works with a wide array of protein fusion tags (e.g., Flag®, His tag, GST tag) and capture technologies. It is ideally suited for HaloTag® Technology-based approaches.

Storage Conditions: Store powdered Protease Inhibitor Cocktail at –30 to –10°C. Reconstituted Protease Inhibitor Cocktail can be stored at 2–10°C for 12 months.

Available in the Helix® on-site stocking system

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Proteinase K (Lyophilized)

Product	Size	Cat.#
Proteinase K	100 mg	V3021

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Proteinase K, produced by the fungus *Tritirachium album* Limber, is a serine protease that exhibits broad cleavage activity. It cleaves peptide bonds adjacent to the carboxylic group of aliphatic and aromatic amino acids and is useful for general digestion of protein in biological samples. It has been purified to remove RNase and DNase activities. The stability of Proteinase K in urea and SDS and its ability to digest native proteins make it useful for a variety of applications including preparation of chromosomal DNA for pulsed-field gel electrophoresis, protein fingerprinting and removal of nucleases from preparations of DNA and RNA. A typical working concentration for Proteinase K is 50–100µg/ml.

Form: Lyophilized powder.

Recommended Reaction Buffer: 50mM Tris-HCl (pH 8.0), 10mM $CaCl_2$.

Features:

- **Stable:** Active over a pH range of 4.3–12.0, in 0.5% SDS or 1% Triton® X-100 and retains >80% of its activity at temperatures up to 60°C.

Storage Conditions: Store lyophilized powder desiccated at –20°C.

Proteinase K (PK) Solution

Product	Size	Conc.	Cat.#
Proteinase K (PK) Solution	4 ml	20 mg/ml	MC5005
	16 ml	20 mg/ml	MC5008
	23 ml		A5051

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Proteinase K, produced by the fungus *Tritirachium album* Limber, is a serine protease that exhibits broad cleavage activity. It cleaves peptide bonds adjacent to the carboxylic group of aliphatic and aromatic amino acids and is useful for general digestion of protein in biological samples. It has been purified to remove RNase and DNase activities. The stability of Proteinase K in urea and SDS and its ability to digest native proteins make it useful for a variety of applications including preparation of chromosomal DNA for pulsed-field gel electrophoresis, protein fingerprinting and removal of nucleases from preparations of DNA and RNA. A typical working concentration for Proteinase K is 50–100µg/ml.

Formulation: Proteinase K (PK) Solution is supplied at a concentration of 20mg/ml in 10mM Tris-HCl (pH 7.5), 1mM calcium chloride and 50% glycerol.

Features:

- **Stable:** Active over a pH range of 4.3–12.0 in 0.5% SDS or 1% Triton® X-100 and retains >80% of its activity at temperatures up to 60°C.
- **Easy to Use:** Provided in solution stable at room temperature and does not require resuspension or thawing prior to use.

Storage Conditions: Store at 22–25°C.

RNase A Solution

Product	Size	Conc.	Cat.#
RNase A Solution	1 ml	4 mg/ml	A7973
	5 ml	4 mg/ml	A7974

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: RNase A is an endoribonuclease that specifically hydrolyzes RNA 3′ of pyrimidine residues and cleaves the phosphodiester linkage to the adjacent nucleotide. RNase A is used to remove RNA during procedures for the isolation of plasmid and genomic DNA.

Storage Conditions: Store at 15–30°C.

SDS Solution, Molecular Biology Grade (10% w/v)

Product	Size	Cat.#
SDS Solution, Molecular Biology Grade (10% w/v)	100 ml	V6551
	500 ml	V6553

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: SDS Solution (10% w/v) is sodium dodecyl sulfate in distilled, deionized water. SDS is a detergent that is known to denature proteins. It is used in polyacrylamide gel electrophoresis for the determination of protein molecular weight. It is also used in nucleic acid extraction procedures for the disruption of cell walls and dissociation of nucleic acid:protein complexes.

Properties:

- **A_{260}:** ≤0.3.
- **A_{280}:** ≤0.2.

Features:

- **Quality Tested:** Each lot of SDS Solution is tested and certified to be free of DNase and RNase activity.

Storage Conditions: Store at +15°C to +30°C.

Sephacryl® S-400

Product	Size	Cat.#
Sephacryl® S-400	10 ml	V3181

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Sephacryl® S-400 is a chromatography matrix used for rapid gel filtration. This matrix is useful in experiments involving the incorporation of synthetic linkers and adaptors. After linker ligation and digestion with the appropriate enzyme, unincorporated linkers and linker fragments may be rapidly removed from the DNA sample using spin columns containing Sephacryl® S-400. Such columns may be used to separate small DNA fragments (≤271bp) from longer DNA molecules.

Composition: Suspension in 10mM Tris-HCl (pH 8.0), 100mM NaCl and 1mM EDTA.

Features:

- **Quality Tested:** Each lot is tested and certified to be free of DNase and RNase activity.

Storage Conditions: Store at +2°C to +10°C.

Sodium Chloride, Molecular Biology Grade

Product	Size	Cat.#
Sodium Chloride, Molecular Biology Grade	500 g	H5271
	1 kg	H5273

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Sodium Chloride, Molecular Biology Grade, is commonly used in many molecular biology and forensic applications.

Formula Weight: 58.45.

Properties:

- **Purity:** ≥99.5%.
- **Iron:** ≤2ppm.
- **Lead:** ≤5ppm.
- **pH at 25°C of 1M:** 5.0–8.0.
- **A_{260} at 1M:** ≤0.02.
- **A_{280} at 1M:** ≤0.01.
- **Conductivity at 25°C (0.05M):** 5,000–7,000µSm.

Features:

- **Quality Tested:** Each lot of Sodium Chloride is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at +15°C to +30°C.

Sodium Dodecyl Sulfate, Molecular Biology Grade (SDS)

Product	Size	Cat.#
Sodium Dodecyl Sulfate, Molecular Biology Grade (SDS)	100 g	H5113
	500 g	H5114
	1 kg	H5115

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Sodium Dodecyl Sulfate, Molecular Biology Grade (SDS), is a detergent that is known to denature proteins. It is used in denaturing polyacrylamide gel electrophoresis for the determination of protein molecular weight. It is also used in nucleic acid extraction procedures for the disruption of cell walls and dissociation of nucleic acid:protein complexes.

Formula Weight: 288.38.

Properties:

- **Purity:** ≥99.5%.
- **pH at 25°C (3% w/v):** 6.0–7.5.
- **A_{230} at 3%:** ≤0.40.
- **A_{260} at 3%:** ≤0.30.
- **A_{280} at 3%:** ≤0.05.
- **A_{405} at 3%:** ≤0.01.

Features:

- **Quality Tested:** Each lot is tested and certified to be free of DNase and RNase activity.

Storage Conditions: Store at +15°C to +30°C.

SSC Buffer, 20X, Molecular Grade

Product	Size	Cat.#
SSC Buffer, 20X, Molecular Grade	1,000 ml	V4261

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: SSC Buffer, 20X, Molecular Grade (pH 7.0), is commonly used in nucleic acid hybridization techniques at concentrations from 0.1X to 20X, depending on the application.

Form: Clear, colorless liquid.

Composition: 3M NaCl, 0.3M sodium citrate (for 20X concentration).

Properties:

- **pH at 25°C (20X):** 6.9–7.1.
- **Lead:** ≤10ppm.
- **Conductivity at 25°C (2X):** 24.4–32.4mmhos.

Features:

- **Quality Tested:** Each lot of SSC Buffer is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at +15°C to +30°C.

Streptavidin

Product	Size	Cat.#
Streptavidin	1 mg	Z7041

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Promega Streptavidin is purified by affinity chromatography and is of the highest quality available.

Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system

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Streptavidin Alkaline Phosphatase

Product	Size	Cat.#
Streptavidin Alkaline Phosphatase	0.5 ml	V5591

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Streptavidin Alkaline Phosphatase is used for the detection of biotinylated molecules.

Composition: Conjugated Streptavidin Alkaline Phosphatase in PBS, 1mg/ml BSA, 1mM $MgCl_2$, 0.1mM $ZnCl_2$ and 0.02% sodium azide.

Features:

- **Quality Tested:** Streptavidin Alkaline Phosphatase is quality tested to ensure optimal performance for the detection of biotinylated molecules.

Storage Conditions: Store at 4°C. **Do not freeze!**

TAE Buffer, Molecular Biology Grade (Tris-acetate-EDTA)

Product	Size	Conc.	Cat.#
TAE Buffer, 10X, Molecular Biology Grade	1,000 ml	10X	V4271
TAE Buffer, 40X, Molecular Biology Grade	1,000 ml	40X	V4281

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: TAE Buffer is the most commonly used buffer for agarose DNA electrophoresis. A 1X solution is obtained by adding 1 part of the concentrated TAE to 9 or 39 parts of deionized water.

Form: Clear, colorless liquid.

Properties:

- **Composition (10X):** 400mM Tris-acetate, 10mM EDTA.
- **Composition (40X):** 1.6M Tris-acetate, 40mM EDTA.
- **pH at 25°C:** 8.2–8.4.
- **Lead:** ≤10ppm.

Features:

- **Quality Tested:** Each lot of TAE Buffer is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at +15°C to +30°C.

TBE Buffer, 10X, Molecular Biology Grade

Product	Size	Cat.#
TBE Buffer, 10X, Molecular Biology Grade	1,000 ml	V4251

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: TBE Buffer, 10X (pH 8.3), is used for polyacrylamide and agarose gel electrophoresis. This product has been optimized for use in DNA applications.

Form: Clear, colorless liquid.

Composition: 890mM Tris-borate, 890mM boric acid, 20mM EDTA.

Properties:

- **pH at 25°C (1X):** 8.2–8.4.

Features:

- **Quality Tested for DNase Activity:** Each lot of TBE Buffer is tested and demonstrates ≤1% release.
- **Quality Tested for RNase Activity:** Each lot of TBE Buffer is tested and demonstrates ≤1% release.

Storage Conditions: Store at +15°C to +30°C.

TE Buffer, 1X, Molecular Biology Grade

Product	Size	Cat.#
TE Buffer, 1X, Molecular Biology Grade	100 ml	V6231
	500 ml	V6232

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: TE Buffer, 1X, Molecular Grade (pH 8.0), is a buffer composed of 10mM Tris-HCl containing 1mM EDTA•Na_2.

Properties:

- **pH at 25°C:** 7.9–8.1.
- **A_{280}:** ≤0.05.

Features:

- **Quality Tested:** Each lot of TE Buffer is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at 15–30°C.

TMB Stabilized Substrate for Horseradish Peroxidase

Product	Size	Cat.#
TMB Stabilized Substrate for Horseradish Peroxidase	200 ml	W4121

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: TMB Stabilized Substrate is a stable, ready-to-use TMB (3,3′, 5,5′-tetramethylbenzidine) color development substrate for localization of horseradish peroxidase-conjugated antibodies on dot blots and Western blots. It is easier to use than 4-chloro-1-naphthol (CN), which must be prepared immediately before use. TMB Stabilized Substrate comes premixed and fully diluted in a proprietary buffer containing less than 0.5% organic solvent.

Features:

- **Convenient:** Premixed, ready-to-use; in proprietary buffer containing less than 0.5% organic solvents.
- **Stable:** Stable at room temperature for 12 months.
- **Sensitive:** At least threefold more sensitive than 4-chloro-1-naphthol (CN); as little as 412pg of β-galactosidase detected on TMB blot as compared to 1.12ng on CN blot when detected with a β-galactosidase-specific antibody and HRP-conjugated secondary antibody.
- **Long-Lasting Color:** Color is much more stable than 4-chloro-1-naphthol and photographs more easily.

Storage Conditions: Store at 22–25°C.

Tris Base, Molecular Biology Grade

Product	Size	Cat.#
Tris Base, Molecular Biology Grade	100 g	H5133
	500 g	H5131
	2,500 g	H5135

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Tris Base, Molecular Biology Grade, is commonly used for many molecular biology applications.

Formula: $C_4H_{11}NO_3$.

Formula Weight: 121.14.

Form: Crystalized free base.

Properties:

- **pH at 25°C of 1M:** 10.0–11.5.
- **Purity:** ≥99.9%.
- **A_{260} at 1M:** ≤0.05.
- **A_{280} at 1M:** ≤0.05.
- **Melting Point:** 167–172°C.
- **Moisture:** ≤0.2%.
- **Lead:** ≤2ppm.
- **Magnesium:** ≤1ppm.
- **Calcium:** ≤1ppm.
- **Iron:** ≤1ppm.

Features:

- **Quality Tested:** Each lot of Tris Base is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at +15°C to +30°C.

Tris-HCl, Molecular Biology Grade (Tris-Hydrochloride)

Product	Size	Cat.#
Tris-HCl, Molecular Biology Grade	100 g	H5121
	500 g	H5123
	2,500 g	H5125

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Tris-HCl, Molecular Biology Grade, is sometimes used in combination with Tris base for preparation of Tris-HCl buffers.

Formula Weight: 157.56.

Properties:

- **pH at 25°C (0.1M):** 4.2–5.0.
- **Purity:** ≥99.0%.
- **A_{240} at 1M:** ≤0.06.
- **A_{260}, A_{280}, A_{300}, A_{600} at 1M:** ≤0.05.
- **Melting Point:** 150–152°C.
- **Moisture:** ≤0.5%.
- **Calcium:** ≤5ppm.
- **Iron:** ≤5ppm.
- **Lead:** ≤1ppm.
- **Magnesium:** ≤1ppm.
- **Manganese:** ≤1ppm.
- **Copper:** ≤1ppm.
- **Zinc:** ≤1ppm.

Features:

- **Quality Tested:** Each lot of Tris-HCl is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at +15°C to +30°C.

Triton® X-100, Molecular Biology Grade

Product	Size	Cat.#
Triton® X-100, Molecular Biology Grade	100 ml	H5142
	500 ml	H5141

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Triton® X-100, Molecular Biology Grade, is a widely used nonionic surfactant.

Properties:

- **Moisture:** ≤1.0%.
- **Lead:** ≤5ppm.
- **Iron:** ≤5ppm.
- **Density at 25°C:** 1.0645–1.0655g/ml.

Features:

- **Quality Tested:** Each lot of Triton® X-100 is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at +15°C to +30°C.

Available in the Helix® on-site stocking system

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Tween® 20, Molecular Biology Grade

Product	Size	Conc.	Cat.#
Tween® 20, Molecular Biology Grade	100 ml	100%	H5152
	500 ml	100%	H5151

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Tween® 20, Molecular Biology Grade, is a nonionic detergent used for many different molecular biology applications.

Properties:

- **Appearance:** Clear, yellow, viscous liquid.
- **Hydroxyl Number:** 96–108.
- **Lead:** ≤10ppm.

Features:

- **Quality Tested:** Each lot of Tween® 20 is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at +15°C to +30°C.

Urea

Product	Size	Cat.#
Urea	1 kg	V3171
	5 kg	V3175

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Urea is a protein denaturant. Urea is qualified for use as the denaturing component in polyacrylamide gels.

Formula: $(NH_2)_2CO$.

Formula Weight: 60.06.

Form: Fine, white, free-flowing pastilles.

Properties:

- **Purity:** ≥99.0%.
- **Melting Point:** 132–135°C.
- **A_{280} at 8M in water:** ≤0.10.
- **Chloride:** ≤0.0005%.
- **Heavy Metals:** ≤0.001%.
- **Iron:** ≤0.001%.
- **Cyanate:** none detected.

Storage Conditions: Store at +15°C to +30°C. Protect from moisture.

Western Blue® Stabilized Substrate for Alkaline Phosphatase

Product	Size	Cat.#
Western Blue® Stabilized Substrate for Alkaline Phosphatase	100 ml	S3841

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Western Blue® Stabilized Substrate for Alkaline Phosphatase is a stable, ready-to-use substrate for Western blots and immunoscreening. It is a mixture of 5-bromo-4-chloro-3-indolyl-phosphate (BCIP) and nitro blue tetrazolium (NBT) in a proprietary stabilizing buffer. Western Blue® Substrate should be used directly and without dilution. This liquid substrate deposits a permanent dark purple stain on membrane sites bearing alkaline phosphatase. Western Blue® Substrate is as sensitive as other reagents based on the BCIP/NBT formulation.

Features:

- **Convenient:** Ready-to-use formulation that does not require dilution or reagent mixing.
- **Sensitive:** Substrate is as sensitive as other commercially available BCIP/NBT formulations and reagents.
- **Stable:** Stable for one year at room temperature.

Storage Conditions: Store at room temperature, 22–25°C.

X-Gal (5-bromo-4-chloro-3-indolyl-β-D-galactopyranoside)

Product	Size	Conc.	Cat.#
X-Gal	100mg/2 ml	50 mg/ml	V3941

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: X-Gal, in conjunction with IPTG, is used to detect β-galactosidase activity to differentiate recombinants from nonrecombinants in cloning experiments using vectors containing the *lac*Z or *lac*Z α-peptide gene.

Features:

- **Concentration:** 50mg/ml in dimethylformamide, 2.0ml/vial.
- **Quality Tested:** X-Gal is tested for use with the pGEM®-Z Vectors in a chromogenicity assay.

Storage Conditions: Store at –30°C to –10°C.

1.2kb Kanamycin Positive Control RNA

Product	Size	Cat.#
1.2kb Kanamycin Positive Control RNA	1 × 5µg	C1381
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: 1.2kb Kanamycin Positive Control RNA is supplied in 10mM Tris-HCl (pH 7.4), 1mM EDTA.

Storage Conditions: Store at –65°C.

Genomic DNA

Product	Size	Cat.#
Human Genomic DNA: Male	100 µg	G1471
Human Genomic DNA: Female	100 µg	G1521
Human Genomic DNA	100 µg	G3041
Mouse Genomic DNA	100 µg	G3091
G1471, G1521, G3041 For Laboratory Use. G3091 For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Genomic DNA from selected species are purified, and greater than 90% of the DNA is longer than 50kb in size as measured by pulsed-field gel electrophoresis. The DNA is suitable for Southern blot hybridizations, genomic analysis (including PCR), and genomic library construction. The Mouse Genomic DNA is isolated from whole blood from disease-free mice. Human Genomic DNA comes from multiple anonymous donors.

Storage Conditions: Store at 4°C.

Herring Sperm DNA

Product	Size	Conc.	Cat.#
Herring Sperm DNA	10 mg	10 µg/µl	D1811
	100 mg	10 µg/µl	D1815
	500 mg	10 µg/µl	D1816
For Laboratory Use.			

Description: Herring Sperm DNA is tested and certified to be free of any DNase or RNase activity. It is useful as a blocking agent in nucleic acid hybridization experiments.

Features:

- **Quality Tested:** Certified to be free of any DNase or RNase activity.
- **Multiple Applications:** Use as a blocking agent in hybridizations or as carrier DNA.
- **Ready to Use:** Provided as a 10mg/ml solution.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –20°C.

Note: Product may be viscous at 4°C. Prior to use, ensure product is at room temperature (it may be briefly warmed at 37°C) and mixed thoroughly to ensure homogeneity.

Lambda DNA

Product	Size	Cat.#
Lambda DNA	250 µg	D1501
For Laboratory Use.		

Description: Lambda DNA *cI*857 *Sam7* is isolated from infected *E. coli* strain W3350. Restriction enzyme-digested Lambda DNA (48,502bp) may be used as a molecular weight size marker in gel analysis of nucleic acids. Lambda DNA is also a commonly used substrate in restriction enzyme activity assays. The nucleotide sequence has been determined.

Features:

- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –20°C.

Unmethylated Lambda DNA

Product	Size	Cat.#
Unmethylated Lambda DNA	250 µg	D1521
For Laboratory Use.		

Description: Unmethylated *cI*857 *Sam7* Lambda DNA (48,502bp) is isolated from infected GM119, an *E. coli* strain lacking both the *dam* and *dcm* methylase activities. Unmethylated Lambda DNA is used as a substrate for restriction enzymes sensitive to DNA methylation.

Features:

- **Unmethylated Substrate:** Use as a substrate for methylation-sensitive restriction enzymes.

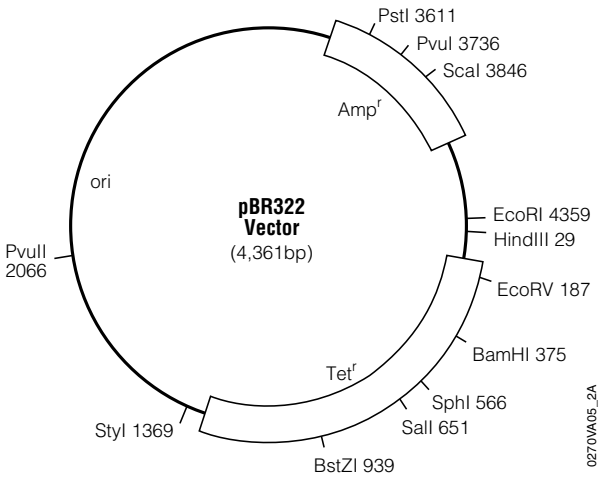
Storage Conditions: Store at –20°C.

pBR322 Vector

Product	Size	Conc.	Cat.#
pBR322 Vector	10 µg	1 µg/µl	D1511
For Research Use Only. Not for Use in Diagnostic Procedures.			

Description: The plasmid pBR322 Vector (4,361bp) carries the genes for tetracycline and ampicillin resistance. pBR322 DNA digests typically are used as molecular weight size markers in gel analysis of nucleic acids.

Storage Conditions: Store at –20°C.



Available in the Helix® on-site stocking system

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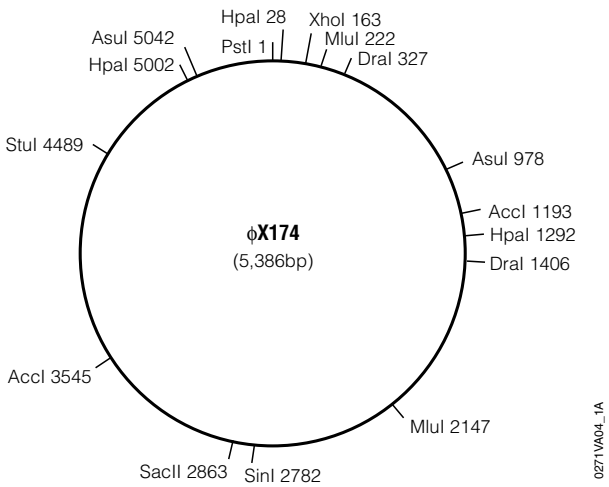
ΦX174, RF DNA

Product	Size	Conc.	Cat.#
ΦX174, RF DNA	50 µg	1 µg/µl	D1531

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The icosahedral bacteriophage ΦX174 replicative form (RF) is a double-stranded circular DNA molecule of 5,386 bases. Restriction enzyme-digested ΦX174 DNA generates molecular weight size markers used in gel analysis of nucleic acids. ΦX174 DNA is often used in the assays of restriction enzymes for the presence of nickase activity.

Storage Conditions: Store at –20°C.



K562 DNA High Molecular Weight

Product	Size	Cat.#
K562 DNA High Molecular Weight	30 µg	DD2011

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: K562 DNA is purified from a subculture of the human chronic myelogenous leukemia cell line. K562 DNA serves as a control for most steps of the single-locus probe analysis procedure. The DNA also can be used as a reference for determining fragment sizes of VNTR alleles following appropriate restriction digestion. K562 fragment sizes obtained may vary slightly due to interlaboratory differences in protocols and methods of analysis.

Concentration: 0.4–1.0µg/µl.

Storage Conditions: Store at –20°C. Always avoid multiple freeze-thaw cycles or exposure to frequent temperature changes. These fluctuations can greatly alter product stability.

K562 Genomic DNA

Product	Size	Cat.#
K562 Genomic DNA	80 µg	E4931

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: K562 Genomic DNA is purified from the human lymphoma cell line K562 by detergent lysis and proteinase K digestion. K562 Genomic DNA is supplied at a concentration of 400µg/ml in TE buffer (10mM Tris-HCl, 1mM EDTA; final pH 8.0).

Storage Conditions: Store at 2–10°C.

Transfection Carrier DNA

Product	Size	Conc.	Cat.#
Transfection Carrier DNA	5 × 20 µg	1 µg/µl	E4881

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Transfection Carrier DNA is a plasmid DNA used to reduce the amount of an expression vector or reporter vector in mammalian cell transfection without reducing the overall amount of DNA. Diluting reporter DNA into Transfection Carrier DNA results in lowered expression of the protein of interest, overcoming artifacts due to overexpression. This is especially relevant when strong, constitutive promoters (e.g., CMV) are used. Depending on the application, the ratio of reporter to Transfection Carrier DNA may require optimization.

This product is made from pGEM®-3Zf(–) Vector but has been purified using a method that results in low endotoxin carryover, making it more suitable for use in transfecting mammalian cells.

Storage Conditions: Store at –30 to –10°C.

Tips and Accessories

Gel Drying Film

Product	Size	Cat.#
Gel Drying Film, 25.0 × 28cm (50 uses)	100 sheets	V7131

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Gel Drying Film is a clear cellulose film used with the Gel Drying Kit. Gel Drying Film is essentially gas-impermeable when dry.

Storage Conditions: Store at room temperature.

Gel Drying Kit

Product	Size	Cat.#
Gel Drying Kit, 17.5 × 20cm capacity	1 kit	V7120

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Gel Drying Kit provides a convenient and economical alternative to expensive and sometimes problematic gel dryers and vacuum systems. Both polyacrylamide and agarose gels may be dried using this kit. After electrophoresis, gels are placed between two moistened sheets of clear cellulose film, the sheets are clamped between the frames, and the gels are left to dry overnight. Gels dried in this manner can be viewed easily while drying and, once dry, are protected from damage and can be stored in laboratory notebooks. The Gel Drying Film is essentially gas-impermeable when dry.

A set of Gel Drying Frames will accommodate one standard 16 × 16cm polyacrylamide gel, four 7 × 9cm minigels or one 7 × 10cm agarose gel.

Features:

- **Convenient and Cost-Effective:** Offers an alternative to gel dryers and vacuum systems.
- **Flexible:** Both polyacrylamide and agarose gels can be dried.
- **Easy to View:** Gels are viewed easily while drying.
- **Easy to Store:** Dried gels are protected from damage and can be stored in laboratory notebooks.
- **Easy to Use:** Dried gels may be scanned densitometrically and also projected using an overhead projector.

Storage Conditions: Store at room temperature.

Plates

Product	Size	Cat.#
Wizard® SV 96 Binding Plates	10 pack	A2271
	100 pack	A2278
Wizard® SV 96 Lysate Clearing Plates	10 pack	A2241
	100 pack	A2248
384-Well Plate, Flat	10 /pk	V5291
384-Well Plate, Conical	10 /pk	V5311

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Binding Plates, Lysate Clearing Plates and 384-Well Plates (Flat and Conical) are available for nucleic acid purification.

The Wizard® SV 96 Binding Plates are used with the Wizard® SV 96 Plasmid DNA Purification System (Cat.# A2250, A2255), Wizard® SV 96 Genomic DNA Purification System (Cat.# A2370, A2371) and Wizard® SV 96 PCR Clean-Up System (Cat.# A9340, A9341, A9342) to isolate DNA, or with the SV 96 Total RNA Isolation System (Cat.# Z3500, Z3505) to isolate RNA. The isolation procedures can be performed manually or on a robotic platform. The Binding Plates are designed for use with the Vac-Man® 96 Vacuum Manifold (Cat.# A2291) or a comparable manifold.

The Wizard® SV 96 Lysate Clearing Plates are used with the Wizard® SV 96 Binding Plates (Cat.# A2271, A2278) and the Vac-Man® 96 Vacuum Manifold (Cat.# A2291) for simultaneous lysate clearing and DNA binding in the Wizard® SV 96 (Cat.# A2250, A2255) and Wizard® SV 9600 (Cat.# A2258) Plasmid DNA Purification System protocols.

Tubes

Product	Size	Cat.#
0.5ml PCR Tubes	50 pack	E4941
	200 pack	E4942
Microtubes, 1.5ml	1,000/bag	V1231

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The 0.5ml PCR Tubes are designed to be used with the Quantus™ Fluorometer and QuantiFluor® Systems.

Microtubes, 1.5ml, are intended for use with several nucleic acid purification systems.

Storage Conditions: Store 0.5ml PCR Tubes at –30°C to 30°C. Store Microtubes, 1.5ml, at 15–30°C.

Available in the Helix® on-site stocking system

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Promega Barrier Tips

Product	Size	Cat.#
Promega 10 Barrier Tips, 960/pk	0.5–10 µl	A1491
Promega 10E Barrier Tips, 960/pk	0.5–10 µl	A1501
Promega 10F Barrier Tips, 960/pk	0.5–10 µl	A1511
Promega 20 Barrier Tips, 960/pk	2–20 µl	A1521
Promega 100 Barrier Tips, 960/pk	10–100 µl	A1541
Promega 200 Barrier Tips, 960/pk	50–200 µl	A1551
Promega 1000 Barrier Tips, 768/pk	100–1,000 µl	A1563

Not For Medical Diagnostic Use.

Description: Aerosol barrier tips eliminate false signals and contamination caused by aerosols. Scientifically designed and tested, Promega Barrier Tips offer performance and economy when working with amplified nucleic acids (PCR), radioactive isotopes, tissue culture fluids, infectious samples and serological specimens.

Promega Barrier Tips are made with an inert ultrahydrophobic HDPE plastic that offers the effectiveness of a self-sealing barrier with the convenience of sample retrieval. In retention tests, Promega Barrier Tips virtually eliminated tip retention and sample holdup.

Features:

- **Sterile:** Promega Barrier Tips are presterilized and certified RNase- and DNase-free. Tips are supplied packaged and sealed in covered trays.
- **Convenient:** Designed to fit perfectly on all major brands of pipettor.

Storage Conditions: Store at room temperature.

Magnetic Stands and Spacers

Product	Size	Cat.#
MagnaBot® 384 Magnetic Separation Device	1 each	V8241
384-Well Plate, Flat	10 /pk	V5291
384-Well Plate, Conical	10 /pk	V5311
MagnaBot® 96 Magnetic Separation Device	1 each	V8151
MagnaBot® II Magnetic Separation Device	1 each	V8351
MagnaBot® Flat Top Magnetic Separation Device	1 each	V6041
Plate Clamp 96	1 each	V8251
Plate Stand	1 each	V8261
Deep Well MagnaBot® 96 Magnetic Separation Device	1 each	V3031
Heat Transfer Block	1 each	Z3271
Heat Block Insert	1 each	Z3651
MagnaBot® Spacer 3/16 inch	1 each	V8381
MagnaBot® Spacer 1/8 inch	1 each	V8581
MagnaBot® Spacer 1/16 inch	1 each	V8681
1/4 inch Foam Spacer	1 each	Z3301
MagneSphere® Technology Magnetic Separation Stand (two-position)	0.5 ml	Z5331
	1.5 ml	Z5332
	12 × 75 mm	Z5333
MagneSphere® Technology Magnetic Separation Stand (twelve-position)	0.5 ml	Z5341
	1.5 ml	Z5342
	12 × 75 mm	Z5343
PolyATtract® System 1000 Magnetic Separation Stand	1 each	Z5410

For Research Use Only. Not for Use in Diagnostic Procedures.

MagneSphere® Magnetic Separation Stands Compatible with the PolyATtract® Systems.

Stand Cat.#	Sample Size	Compatible Product
2-Position Stand		
Z5331	5–10mg	PolyATtract® System 1000
Z5332	5–35mg	PolyATtract® System 1000 PolyATtract® System III or IV
	1×10^6 cells	PolyATtract® System 1000
Z5333	35–100mg	PolyATtract® System 1000 PolyATtract® System I or II
Z5410	0.1–1g or 10^7–10^8 cells	PolyATtract® System 1000
12-Position Stand		
Z5341	5–10mg	PolyATtract® System 1000
Z5342	5–35mg or 1×10^6 cells	PolyATtract® System 1000 PolyATtract® System III or IV
Z5343	35–100mg	PolyATtract® System 1000

9488LA

Vacuum Manifolds and Accessories

Product	Size	Cat.#
Vac-Man® 96 Vacuum Manifold	1 each	A2291
Vac-Man® Jr. Laboratory Vacuum Manifold, 2-sample capacity	1 each	A7660
Vac-Man® Laboratory Vacuum Manifold, 20-sample capacity	1 each	A7231
Available Separately		
One-Way Luer-Lok® Stopcocks	10 each	A7261
Vacuum Adapters	20 each	A1331
For Research Use Only. Not for Use in Diagnostic Procedures.		

Eluator™ Vacuum Elution Device

Product	Size	Cat.#
Eluator™ Vacuum Elution Device	4 each	A1071
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The Eluator™ Vacuum Elution Device is used to elute nucleic acids from PureYield™ Midiprep or Maxiprep columns. It consists of two pieces, a blue base and a clear column assembly. The base interfaces with a Vacuum Manifold that contains Luer-Lok® fittings, such as the Vac-Man® Laboratory Vacuum Manifold (Cat.# A7231), and holds a 1.5ml tube to capture the eluted nucleic acids. The column assembly accepts PureYield™ Midiprep or Maxiprep columns.

The Eluator™ Device eliminates the requirement for a centrifuge with a swinging bucket rotor for nucleic acid purification, simplifying and speeding purification protocols.

Storage Conditions. Store at 15–30°C.

MagnaBot® FLEX 96 Magnetic Separation Device

Product	Size	Cat.#
MagnaBot® FLEX 96 Magnetic Separation Device	1 each	VA1290
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The MagnaBot® FLEX 96 Magnetic Separation Device is designed for high-throughput bioseparation using magnetic particles such as MagneSil® Paramagnetic Particles. This method uses the principle of magnetic separation as an alternative to vacuum filtration and centrifugation separation formats. For best results, use a multiwell plate that is free of flashing or support in the interstitial space between every 4 wells, such as 2ml Nunc™ 96-Well Polypropylene DeepWell™ Storage Places (Cat.# AS9307 or Thermo Fisher Cat.# 278743).

Features:

- Designed for use during automated processing with Maxwell® HT Paramagnetic particles
- Compatible with 96-well plates

Storage Conditions: Store at 15–30°C.

x-tracta™ Gel Extractor

Product	Size	Cat.#
x-tracta™ Gel Extractor	25 /pack	A2121
	100 /pack	A2122
Wizard® SV Gel and PCR Clean-Up System and x-tracta™ Gel Extractor Bundle	50 preps/25 extractors	A9283
	250 preps/100 extractors	A9284
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The x-tracta™ Gel Extractor tool provides a convenient, safe method for removal of agarose gel fragments for further processing. The device removes a 0.13 × 0.33 inch gel piece from agarose gels for easy transfer into a microcentrifuge tube for processing. The x-tracta™ tool eliminates the need for razor blades or scalpels, and its single-use design eliminates the possibility for sample-to-sample cross-contamination.

Note: The x-tracta™ Gel Extractor works best on 0.6–2% analytical grade agarose gels. Please exercise caution if using the x-tracta™ Gel Extractor on Low Melting Point (LMP) agarose gels because the extractor does not work effectively on these due to the gel consistency.

Storage Conditions: Store at 22–25°C.

Available in the Helix® on-site stocking system

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Promega

Ask A Scientist

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Promega

Lab Automation

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Lab Automation

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Maxwell® and Maxprep™ Instruments

Maxwell® RSC 48 Instrument

Product	Size	Cat.#
Maxwell® RSC 48 Instrument	1 each	AS8500
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The Maxwell® RSC 48 Instrument is a compact, automated nucleic acid purification platform that processes up to 48 samples simultaneously. Using Maxwell® RSC prefilled cartridges, the Maxwell® RSC 48 Instrument brings consistent, reliable purification of DNA or RNA from a variety of sample types. The intuitive graphical interface makes the instrument easy to use. The integrated vision system with its large LED indicator reduces the potential for user error by detecting proper cartridge placement. An integrated Bar Code Reader makes it easy to track samples.

Information on the service and support products.

Features:

- High-quality nucleic acid purification with minimal steps and less hands-on time
- Purifies 1–48 samples in a single run
- Intuitive software and integrated vision system for detecting and preventing deck tray setup errors

Storage Conditions: Store at 15–25°C.

Maxprep™ Liquid Handler with the Maxwell® RSC 48 Instrument

Product	Size	Cat.#
Maxprep™ Liquid Handler, RSC Carriers	1 each	AS9100
Maxprep™ Liquid Handler, RSC Carriers w/ UV Light	1 each	AS9101
Maxprep™ Liquid Handler, RSC 48 Carriers	1 each	AS9200
Maxprep™ Liquid Handler, RCS 48 Carriers w/UV Light	1 each	AS9201
Consumables Available Separately	**Size**	**Cat.#**
Nunc 2.0ml Deep Well Plates	60/pack	AS9307
Maxprep™ 50µl Conductive Disposable Tips, Filtered	5,760 tips	AS9301
Maxprep™ 300µl Conductive Disposable Tips, Filtered	5,760 tips	AS9302
Maxprep™ 1000µl Conductive Disposable Tips, Filtered	3,840 tips	AS9303
Maxprep™ Reagent Reservoir, 50ml	28/pack	AS9304
Maxprep™ Waste Bags, Clear	100/pack	AS9305
Accessories Available Separately	**Size**	**Cat.#**
Maxprep™ UV Lamp	1 each	AS9310
Maxprep™ Carrier, Maxwell RSC	1 each	AS9402
Maxprep™ Carrier, Maxwell RSC 48 Front	1 each	AS9403
Maxprep™ Carrier, Maxwell RSC 48 Back	1 each	AS9404
Maxprep™ Carrier, 12–13mm Sample Tubes	1 each	AS9405
Maxprep™ Carrier, 15–17mm Sample Tubes	1 each	AS9406
Maxprep™ Carrier, 10mm Sample Tubes	1 each	AS9407
Maxprep™ Plunger Holder	1 each	AS9408
Maxprep™ 3-Position Reagent Tube Holder	1 each	AS9409
Maxprep™ Gripper Paddle	1 each	AS9410
Maxprep™ Plunger Tool	1 each	AS9411
Maxprep™ Reagent Carrier	1 each	AS9412
RSC Plunger Pack	48/pack	AS1670
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Our modular nucleic acid preparation solutions let you adapt your laboratory workflow as your needs change. You can combine the Maxprep™ Liquid Handler with the Maxwell® RSC and RSC 48 Instruments for automated sample preparation to create a virtual assembly line in your laboratory.

Information on the service and support products.

Features:

- Automated Maxwell® sample preparation with the Maxprep™ Liquid Handler
- Hands-free nucleic acid extraction on the Maxwell® RSC 48
- Post-extraction sample preparation for quantitation, normalization and amplification setup using the Maxprep™ Liquid Handler

Storage Conditions: Store at 15–25°C.

Maxwell® RSC 48 Qualification Products

Product	Size	Cat.#
Installation Qualification	1 each	SA1357
Operational Qualification	1 each	SA1358
IQ/OQ Package	1 each	SA1359

Description: The Maxwell® RSC 48 Installation Qualification and Operational Qualification products offer:

- Fixed-cost service products for predictable support expenditures
- Factory-trained service specialists ensure consistent and reliable service
- Ongoing system documentation for audit tracing and compliance
- Comprehensive service and support means minimal instrument downtime

Maxwell® RSC 48 Installation Qualification

The Installation Qualification service product includes a series of formal instrument checks, delivers written documentation of instrument functionality and demonstrates that everything ordered with the instrument is supplied and installed at the customer's laboratory. This service product must be delivered by a Promega representative who is certified to perform the Installation Qualification. The service product involves a site visit to perform:

- Installation by qualified Promega personnel
- Inspection of shipping containers, instrument and accessories
- Comparison of items received vs. items on purchase order
- Inspection of laboratory conditions (power, etc.)
- Review of all hazards and precautions with users
- Confirmation/installation of correct firmware version
- Testing of instrument run
- Recording and documenting installation and actions

Maxwell® RSC 48 Operational Qualification

The Operational Qualification (OQ) service product demonstrates that the instrument functions according to its operational specifications. This service product must be delivered by a Promega representative who is certified to perform the Operational Qualification. The service product involves a site visit to perform:

- Running operational verification tests
- Documenting all calibration and test results
- Training users to operate the instrument
- Training users to use the log book
- Completing customer-specific log book and OQ documentation

Features:

- The Installation Qualification (IQ) includes a series of instrument checks, delivers written documentation of functionality and demonstrates that everything ordered with the instrument is supplied and installed
- The Operational Qualification (OQ) service product demonstrates that the instrument functions according to its operational specifications
- The IQ/OQ Package combines both services

Available in the Helix® on-site stocking system

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Maxprep™ Liquid Handler Qualification Products

Product	Size	Cat.#
Installation Qualification	1 each	SA1397
Operational Qualification	1 each	SA1398
IQ/OQ Package	1 each	SA1399

Description: These service products must be delivered by a Promega representative who is certified to perform the installation and operational qualification.

Maxprep™ Liquid Handler Installation Qualification and Operational Qualification

The Maxprep™ Liquid Handler Installation Qualification and Operational Qualification products offer:

- Installation by qualified Promega personnel
- Fixed-cost service products for predictable support expenditures
- Factory-trained service specialists ensure consistent and reliable service
- Ongoing system documentation for audit tracing and compliance

Maxprep™ Liquid Handler Installation Qualification

The Installation Qualification service product includes a series of formal instrument checks, delivers written documentation of instrument functionality and demonstrates that everything ordered with the instrument is supplied and installed at the customer's laboratory. This service product must be delivered by a Promega representative who is certified to perform the Installation Qualification. The service product involves a site visit to perform:

- Installation by qualified Promega personnel
- Inspection of shipping containers, instrument and accessories
- Comparison of items received vs. items on purchase order
- Inspection of laboratory conditions (power, etc.)
- Review of all hazards and precautions with users
- Confirmation/installation of correct firmware version
- Testing of instrument run
- Recording and documenting installation and actions

Maxprep™ Liquid Handler Operational Qualification

The Operational Qualification (OQ) service product demonstrates that the instrument functions according to its operational specifications. This service product must be delivered by a Promega representative who is certified to perform the Operational Qualification. The service product involves a site visit to perform:

- Running operational verification tests
- Documenting all calibration and test results
- Training users to operate the instrument
- Training users to use the log book
- Completing customer-specific log book and OQ documentation

Features:

- The Installation Qualification (IQ) includes a series of instrument checks, delivers written documentation of functionality and demonstrates that everything ordered with the instrument is supplied and installed by a certified Promega representative
- The Operational Qualification (OQ) service product demonstrates that the instrument functions according to its operational specifications
- The IQ/OQ Package combines both services

Maxwell® CSC Instrument

Product	Size	Cat.#
Maxwell® CSC Instrument	1 each	AS6000
Available Separately		
RSC/CSC Deck Tray	1 each	SP6019
RSC/CSC Plungers	50/pack	AS1331

AS6000 For In Vitro Diagnostic Use. This product is only available in certain countries.
SP6019, AS1331 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Maxwell® Clinical Sample Concentrator (CSC) Instrument provides automated nucleic acid purification for a range of clinical sample types. The purification methods use sample lysis and binding to paramagnetic particles as the primary separation principle. Up to 16 samples can be prepared in a single run.

Features:Performance

- **Reduce Errors:** Minimal steps with automation.
- **Get Results Faster:** DNA from blood with 38-minute processing time.
- **Reduce Repeat Testing:** High-purity, high-concentration nucleic acid from blood.
- **Eliminate Contamination:** Particle processing technology combined with UV light for sanitization.
- **Spend Less Money:** Less expensive in terms of instrument and per prep price.
- **Do More with Less Space:** Small footprint.

Software

- **Simple Sample Tracking and Document Control:** Integrated bar code reader.
- **Easy to Use:** Controlled via Windows® 10 on tablet with touch screen interface.
- **Advanced Administrator Options.**
- **Update Method Easily:** Improved functionality for new method import.

Regulatory

- **Simplify Validation and Improve Reliability:** QSR-manufactured, CSC-labeled (including software).
- **Be Prepared for Audits:** Design master file.
- **Count on World-Class Service and Support to Ensure Minimal Instrument Downtime:** IQ/OQ service options.

Storage Conditions: Store at 15–30°C.

Maxwell® CSC Service and Support Products

Product	Size	Cat.#
Maxwell® CSC Standard Service Agreement	1 each	SA1110
Maxwell® CSC Premier Service Agreement	1 each	SA1120
Maxwell® CSC Preventive Maintenance	1 each	SA1130
Maxwell® CSC Installation Qualification	1 each	SA1140
Maxwell® CSC Operational Qualification	1 each	SA1150
Maxwell® CSC IQ/OQ Combination Package	1 each	SA1160
This product is only available in certain countries.		

Description: Upon purchase of the Maxwell® CSC Instrument, the instrument will be covered by a one-year Premier Warranty. The **Premier Warranty** covers all parts, labor and shipping to and from our depot repair location (including a loaner instrument arriving at your lab within 1 working day) or onsite repair by a factory-trained service technician arriving within 2 business days. We will repair your instrument and return it to you performing to original factory specifications. The Premier Warranty also includes one preventive maintenance visit.

Once the initial one-year warranty has expired, there are several options for continuing service coverage:

Maxwell® CSC Standard Service Agreement (SA1110): The Standard Service Agreement covers all parts, labor and shipping to and from our depot repair location as well as a loaner instrument upon request. If your Maxwell® CSC Instrument needs repair, we will provide a box for shipment of the instrument back to our service facility. We will repair it and return it performing to original factory specifications. Preventive maintenance visits are available separately.

Maxwell® CSC Premier Service Agreement (SA1120): The Premier Service Agreement includes all parts, labor and shipping to and from our depot repair location (including a loaner instrument arriving at your lab within 1 working day) or an onsite service visit by a factory-trained service technician within 2 business days. Additionally, it includes one annual preventive maintenance visit per year. Additional preventive maintenance visits are available separately.

Maxwell® CSC Preventive Maintenance (SA1130): In order to keep the system operation at peak performance, Promega recommends that Maxwell® CSC Instruments receive a Preventive Maintenance check after 12 months of use. During this procedure, our qualified service personnel test the instrument, check consumable parts for wear and replace them as needed. Additionally, the system is aligned and performance is verified. Documentation for your files is provided. The preventive maintenance service is performed by returning the instrument to an authorized service center. Onsite service is available for an additional charge.

Maxwell® CSC Installation Qualification and Operational Qualification (Cat.# SA1140, SA1150, SA1160)

The Installation Qualification service product includes a series of formal instrument checks, delivers written documentation of instrument functionality and demonstrates that everything ordered with the instrument is supplied and installed at the customer's laboratory. This service product must be delivered by a Promega representative who is certified to perform the Installation Qualification. The service product involves a site visit to perform:

- installation by qualified Promega personnel
- inspection of shipping containers, instrument and accessories
- comparison of items received against items on the purchase order
- inspection of laboratory conditions (power, etc.)
- review of all hazards and precautions with users
- confirmation/installation of correct software version
- instrument test run
- documentation of Installation Qualification.

The Operational Qualification service product demonstrates that the instrument functions according to its operational specifications. This service product must be delivered by a Promega representative who is certified to perform the Operational Qualification. The service product involves a site visit to:

- run operational verification tests
- document all calibration and test results
- train customer(s) to operate the instrument
- train customer(s) to use the log book
- complete Operation Qualification documentation.

Features:

- **Fixed-Cost Service Products:** Predictable support expenditures.
- **Factory-Trained Service Specialists:** Consistent and reliable service.
- **Ongoing System Documentation:** Audit tracing and compliance.
- **Comprehensive Service and Support:** Minimal instrument downtime.

Available in the Helix® on-site stocking system

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Maxwell® FSC Instrument

Product	Size	Cat.#
Maxwell® FSC Instrument	1 each	AS4600
Maxwell® FSC Deck Tray	1 each	AS4016

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Maxwell® FSC Instrument, along with DNA IQ™ chemistry, offers easy-to-use, consistent, automated nucleic acid extraction from casework samples such as blood stains, semen stains, hairs, cigarette butts, tissues and trace DNA samples. Automated DNA extraction saves laboratories time and labor costs and frees staff to work on casework analysis.

Features:

- High-quality DNA extraction with minimal hands-on time.
- Bar code reader for simplified data entry.
- Intuitive software and touch screen interface.

Storage Conditions: Store at 15–30°C.

Maxwell® RSC Instrument

Product	Size	Cat.#
Maxwell® RSC Instrument	1 each	AS4500
Available Separately		
RSC/CSC Deck Tray	1 each	SP6019
Maxwell® Instrument Bar Code Reader	1 each	AS3200

AS4500, SP6019, AS3200 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Maxwell® Rapid Sample Concentrator (RSC) Instrument is a platform for automated purification of nucleic acid from a range of sample types. The purification methods use sample lysis and binding to paramagnetic particles as the primary separation principle. Up to 16 samples can be prepared simultaneously in 25–60 minutes, depending on sample type.

The Maxwell® RSC Instrument is controlled by a graphical user interface running on a tablet PC. The instrument is supplied with a Quantus™ Fluorometer and integrated software that allows extracted nucleic acid quantification measurements to be captured in the run report along with sample tracking and method run data.

Features:

- **Easy to Use:** Intuitive software and simple validation; very little hands-on time.
- **Automation:** Get to results faster with minimal steps and lower costs.
- **Quantus™ Fluorometer Integration:** Quickly capture extracted nucleic acid concentration values in the run report.
- **Flexible and Efficient Workflow:** Access sample at any point in workflow; consistent performance eliminates reruns.
- **Technology:** Magnetic particles enhance concentration, minimize contamination and provide highly pure and amplifiable nucleic acid ready for downstream analysis.
- **Small Footprint:** Do more in less space.

Maxwell® RSC Service and Support Products

Product	Size	Cat.#
Maxwell® RSC Premier Warranty Upgrade	1 each	SA1341
Maxwell® RSC Standard Service Agreement	1 each	SA1342
Maxwell® RSC Premier Service Agreement	1 each	SA1343
Maxwell® RSC Preventive Maintenance	1 each	SA1346
Maxwell® RSC Installation Qualification	1 each	SA1347
Maxwell® RSC Operational Qualification	1 each	SA1348
Maxwell® RSC IQ/OQ Combination Package	1 each	SA1349

Description: Upon purchase of the Maxwell® RSC Instrument, the instrument will be covered by a one-year Standard Warranty. The **Standard Warranty** covers all parts, labor and shipping to and from our depot repair location as well as a loaner instrument upon request. If your Maxwell® RSC Instrument needs repair, we will provide a box for shipment of the instrument back to our service facility. We will repair it and return it performing to original factory specifications. Preventive Maintenance visits are available separately.

If you need additional coverage during the one-year Standard Warranty period, a Premier Warranty Upgrade is available. The **Maxwell® RSC Premier Warranty Upgrade** (Cat.# SA1341) includes all parts, labor and shipping to and from our depot repair location as well as your choice of a loaner instrument within 1 business day* or on-site service visit by a factory-trained service technician within 2 business days*. Additionally, it includes one annual Preventive Maintenance visit per year, which can be performed by returning the instrument to an authorized service center or by an on-site visit by a service technician. Additional Preventive Maintenance visits are available separately.

*Where available.

Once the initial one-year Standard Warranty has expired, there are several options for continuing service coverage:

Maxwell® RSC Standard Service Agreement (Cat.# SA1342), covers all parts, labor and shipping to and from our depot repair location as well as a loaner instrument upon request. If your Maxwell® RSC Instrument needs repair, we will provide a box for shipment of the instrument back to our service facility. We will repair it and return it performing to original factory specifications. Preventive Maintenance visits are available separately.

Maxwell® RSC Premier Service Agreement (Cat.# SA1343), includes all parts, labor and shipping to and from our depot repair location as well as your choice of a loaner instrument within 1 business day* or on-site service visit by a factory-trained service technician within 2 business days*. Additionally, it includes one annual Preventive Maintenance visit per year, which can be performed by returning the instrument to an authorized service center or by an on-site visit by a service technician. Additional Preventive Maintenance visits are available separately.

*Where available.

Maxwell® RSC Preventive Maintenance (Cat.# SA1346): In order to keep the system operating at peak performance, we recommend that Maxwell® RSC Instruments receive a Preventive Maintenance check after 12 months of use. During this procedure, our qualified service personnel test the instrument, check parts for wear and replace them as needed. Additionally, the system is aligned and performance is verified. Documentation for your files is provided. The preventive maintenance service is performed by returning the instrument to an authorized service center.

Maxwell® RSC Installation Qualification and Operational Qualification Products, Cat.# SA1347, SA1348, SA1349

The Installation Qualification service product includes a series of formal instrument checks, delivers written documentation of instrument functionality and demonstrates that everything ordered with the instrument is supplied and installed at the customer's laboratory. This service product must be delivered by a Promega representative who is certified to perform the Installation Qualification. The service product involves a site visit to perform:

- Installation by qualified Promega personnel
- Inspection of shipping containers, instrument and accessories
- Comparison of items received vs. items on purchase order
- Inspection of laboratory conditions (power, etc.)
- Review all hazards and precautions with users
- Confirmation/installation of correct firmware version
- Testing of instrument run
- Recording and documenting installation and actions

The Operational Qualification (OQ) service product demonstrates that the instrument functions according to its operational specifications. This service product must be delivered by a Promega representative who is certified to perform the Operational Qualification. The service product involves a site visit to perform:

- Running operational verification tests
- Documenting all calibration and test results
- Training user to operate the instrument
- Trainings users to use the log book
- Completing customer-specific log book, instrument sticker and OQ documentation

Features:

- **Fixed-Cost Service Products:** Predictable support expenditures.
- **Factory-Trained Service Specialists:** Consistent and reliable service.
- **Ongoing System Documentation:** Audit tracing and compliance.
- **Comprehensive Service and Support:** Minimal instrument downtime.

Available in the Helix® on-site stocking system

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Large Volume Nucleic Acid Extraction

HSM 2.0 Instrument

Product	Size	Cat.#
HSM 2.0 Instrument	1 each	A2715
Available Separately		
HSM 2.0 Instrument Cover	1 each	A2712
HSM 2.0 Tube Rack	1 each	A2713
HSM 2.0 Tube Rack Stand	1 each	A2714
HSM 2.0 Instrument 1-Year Service Agreement	1 each	SA1330
ReliaPrep™ LV 32 HSM Standard Service Agreement	1 each	SA3070

A2712, A2715, A2713, A2714, SA3070 For Research Use Only. Not for Use in Diagnostic Procedures. Products may not be available in all countries. Please contact your local representative for more information.

Description: The Heater Shaker Magnet Instrument (HSM 2.0) is designed to perform all of the functions necessary for processing magnetic resin-based purification chemistries in large-volume formats. With its ability to heat, shake and apply a magnetic field, the HSM 2.0 Instrument provides all-in-one processing capabilities for a variety of large-volume purification chemistries in either a manual or automated format. The instrument uses standard 50ml conical tubes, magnets and reagent-based paramagnetic particles (PMPs). The PMPs provide a mobile solid phase that optimizes capture, washing and elution of biological target molecules.

Power Supply, HSM 2.0 Instrument and Tube Rack on Tube Rack Stand (from left to right).

Initially designed to run the ReliaPrep™ Large Volume HT gDNA Isolation System (Cat.# A2751), the HSM 2.0 Instrument is supplied with software containing preprogrammed isolation methods for processing up to 32 samples of human whole blood in approximately 2–3.5 hours, depending on sample volume and number. Samples are processed in a semi-automated method with the user dispensing and aspirating reagents from the samples as directed by the software on a computer screen. The programmed methods control the heating, shaking, magnetization and timing of the steps required for the semi-automated purification. For fully automated purification, the HSM 2.0 Instrument can be integrated with a robotic liquid-handling workstation, which can process 32 samples in less than 4.5 hours.

Minimum Software Computer Requirements:

Windows® PC

Dual-Core x86-based processor, 2MB Memory, 100GB HD, Video 1024 × 768

Microsoft Windows® 7 Professional and Ultimate editions (32-bit or 64-bit)

Use of up-to-date antivirus software is strongly recommended.

11277TA

Promega

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Plate Readers, Fluorometers and Luminometers

Products tagged with the Helix® icon are available for distribution through our convenient on-site stocking program in a freezer, refrigerated unit or an ambient cabinet.

For more information visit: **www.promega.com/helix**

Available in the Helix® on-site stocking system

Microplate Readers

GloMax® Discover System

Product	Size	Cat.#
GloMax® Discover System	1 each	GM3000
Available Separately		
Light Plate, ABS/Fluor	1 each	E6532
GloMax® Dual Injectors with Pumps	1 each	GM3030
GloMax® Discover Luminescence Filter Paddle	1 each	GM3011
GloMax® Discover Fluorescence Filter Paddle	1 each	GM3012
GloMax® Discover or Explorer Installation Qualification	1 each	SA1104
GloMax® Discover or Explorer Operational Qualification	1 each	SA1105
GloMax® Discover or Explorer Installation and Operational Qualification	1 each	SA1106
GloMax® Discover or Explorer Instrument Rental, 1 month	1 each	SA1098
GloMax® Discover Standard Service Agreement	1 each	SA4000
GloMax® Discover or Explorer Preventive Maintenance	1 each	SA4030
GloMax® Discover 96 Half-Position Aperture Assembly	1 each	GM1050

E6532, GM3000, GM3030, GM3011, GM3012, GM1050 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The GloMax® Discover System is a high-performance multimode detection instrument developed with Promega reagent chemistries to provide a simple means of detecting advanced chemistries. This instrument provides superior luminescence sensitivity and dynamic range for both strong and weak bioluminescence experimental samples, as well as a seamless integration with Promega bioluminescent assays. GloMax® Discover also provides flexible use of filters for fluorescence intensity, BRET, FRET, filtered luminescence and UV-visible absorbance measurements.

The instrument is operated by an integrated Tablet PC, which provides quick and easy navigation through the control options. Exporting your results is made seamless with a variety of options, including exporting to your local data network. The GloMax® Discover software will provide many of the required technical elements of a part 11 compliant system (user authentication and authorization, data integrity and protection, electronic signatures and audit trails) when used with the appropriate laboratory workflow.

Features:

- **Full Range Capabilities:** Luminescence, fluorescence, BRET, FRET, and UV-visible absorbance detection.
- **Integrated with Promega Assays:** Developed and optimized with Promega cell and gene reporter assays for seamless workflow; you will be up and running faster.
- **Easy-to-Use:** Simple Tablet PC touch screen navigation with full PC capabilities and a state-of-the-art graphical user interface.
- **Superior Performance:** Broader dynamic range, better sensitivity and lower well-to-well cross talk for more usable data from your experiment.
- **Connected to Your Workflow:** Use as a standalone instrument or integrate into your high-throughput automated workflow; export data to your laboratory network.

GloMax® Discover and GloMax® Explorer Systems.

GloMax® Explorer System

Product	Size	Cat.#
GloMax® Explorer Fully Loaded Model	1 each	GM3500
GloMax® Explorer with Luminescence and Fluorescence	1 each	GM3510
Available Separately		
GloMax® Explorer Absorbance Module Upgrade	1 each	GM3520
Light Plate, ABS/Fluor	1 each	E6532
GloMax® Dual Injectors with Pumps	1 each	GM3030
GloMax® Discover Fluorescence Filter Paddle	1 each	GM3012
GloMax® Discover or Explorer Installation Qualification	1 each	SA1104
GloMax® Discover or Explorer Operational Qualification	1 each	SA1105
GloMax® Discover or Explorer Installation and Operational Qualification	1 each	SA1106
GloMax® Explorer Standard Service Agreement	1 each	SA1107
GloMax® Discover or Explorer Instrument Rental, 1 month	1 each	SA1098
GloMax® Discover Standard Service Agreement	1 each	SA4000
GloMax® Discover or Explorer Preventive Maintenance	1 each	SA4030
GloMax® Discover 96 Half-Position Aperture Assembly	1 each	GM1050

GM3500, GM3510, E6532, GM3030, GM3012, GM1050 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The GloMax® Explorer System is a high-performance multimode detection instrument developed with Promega reagents to provide a simple means of detecting advanced chemistries. This instrument provides superior luminescence sensitivity and dynamic range for both strong and weak bioluminescence experimental samples as well as seamless integration with Promega bioluminescence assays.

GloMax® Explorer measures luminescence, fluorescence intensity and visible absorbance. The instrument is operated by an integrated tablet PC, which provides quick and easy navigation through the control options. Exporting your results is easy with a variety of options, including export to your local data network. The GloMax® Explorer software provides many of the required technical elements of a part 11-compliant system (user authentication and authorization, data integrity and protection, electronic signatures and audit trails) when used with the appropriate laboratory workflow.

Features:

- **Flexible Configuration Options:** Luminescence, fluorescence and UV-visible absorbance detection.
- **Integrated with Promega Assays:** Developed and optimized with Promega cell and gene reporter assays for seamless workflow; you will be up and running faster.
- **Easy to Use:** Simple tablet PC touch screen navigation with full PC capabilities and state-of-the-art graphical user interface.
- **Superior Performance:** Broader dynamic range, better sensitivity and lower well-to-well cross talk for more usable data from your experiment.
- **Connect to Your Workflow:** Use as a standalone instrument or integrate into your high-throughput automated workflow.

GloMax® Navigator System

Product	Size	Cat.#
GloMax® Navigator System	1 each	GM2000
GloMax® Navigator System with Dual Injectors and Pumps	1 each	GM2010
Available Separately	**Size**	**Cat.#**
GloMax® Navigator Standard Service Agreement	1 each	SA1301
Dual Injector Pump Station Upgrade for GloMax® Navigator	1 each	SA1304
GloMax® Navigator Installation Qualification	1 each	SA1305
GloMax® Navigator Operational Qualification	1 each	SA1306
GloMax® Navigator Installation and Operational Qualification	1 each	SA1307
GloMax® Navigator Preventive Maintenance	1 each	SA1308

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The GloMax® Navigator System is an easy-to-use microplate luminometer integrated with Promega chemistries for superior assay performance. The system provides researchers superior luminescence sensitivity and dynamic range for both strong and weak bioluminescence experimental samples as well as seamless integration with Promega industry-leading bioluminescent gene reporter, cell-based and biochemical assays.

GloMax® Navigator is operated by an integrated Tablet PC, which provides quick and easy navigation through the control options. Exporting your results is easy with a variety of options, including exporting to your local data network, USB flash drive and cloud-based storage locations. The GloMax® Navigator software provides many of the required technical elements of a part 11-compliant system (user authentication and authorization, data integrity and protection, electronic signatures and audit trails) when used with the appropriate laboratory workflow.

Features:

- **Get Up and Running Faster with Integrated Promega Assays:** Developed and optimized with Promega cell and gene reporter assays for seamless workflow.
- **Enjoy Ease of Use:** Simple tablet PC touch screen navigation with full PC capabilities and state-of-the-art graphical user interface.
- **Experience Superior Performance:** Broader dynamic range, better sensitivity and lower well-to-well cross talk for more usable data from your experiment.
- **Spend Less Time Optimizing.**
- **Export Data to your Laboratory Network:** The software provides many of the required technical elements of a part 11-compliant system (user authentication and authorization, data integrity and protection, electronic signatures and audit trails) when used with the appropriate laboratory workflow.

Storage Conditions: Store at 4–50°C under noncondensing conditions and up to 75% humidity.

Fluorometers

Quantus™ Fluorometer

Product	Size	Cat.#
Quantus™ Fluorometer	1 each	E6150
Available Separately		
0.5ml PCR Tubes	50 pack	E4941
	200 pack	E4942
Quantus™ Instrument Standard Service Agreement	1 each	SA4040

E4941, E6150, E4942 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Quantus™ Fluorometer is a dual-channel fluorometer for your personal quantitation workflow. Designed to provide highly sensitive fluorescent detection when quantifying nucleic acids, the compact instrument is simple to operate. The Quantus™ Fluorometer is optimized with preprogrammed settings for Promega QuantiFluor® Dye Systems (QuantiFluor® dsDNA, RNA and ssDNA Systems) for nucleic acid quantitation, and allows users the flexibility to create their own methods and quantitation settings for other dyes.

The Quantus™ Fluorometer is equipped with two fluorescence channels for nucleic acid and protein quantitation:

- Blue fluorescence channel: Excitation 495nm shortpass (wavelengths up to 495nm), emission 510–580nm.
- Red fluorescence channel: Excitation 640nm shortpass (wavelengths up to 640nm), emission 660–720nm.

Features:

- **High Performance:** Integrated with QuantiFluor® Dyes for high sensitivity, broad dynamic range and target specificity. Great for low-level sample quantitation such as FFPE or viral samples.
- **Increased Sensitivity:** Significantly increased sensitivity over absorbance at 260nm (NanoDrop® spectrophotometer) for those samples that are low in concentration. Ten times more sensitive than Qubit® 2.0 and a detection limit of 50pg/ml, compared to 500pg/ml for the Qubit® 2.0. With a customized low standard curve, lower amounts can be detected.
- **Easy-to-Use Workflow and Navigation:** Flexible with custom protocols and user-defined settings. PC software for data management workflow.
- **Affordable Price:** Cost-effective to easily incorporate into your laboratory.
- **Recommended for Next-Gen Sequencing:** Successfully used in several Next-Gen Sequencing systems, including Illumina (HiSeq/miSeq), Roche (454) and LifeTech (ion Torrent and ion Proton) systems.

Quantus™ Fluorometer.

Available in the Helix® on-site stocking system

Section Contents
Table of Contents

Quantus™ NGS Starter Package

Product	Size	Cat.#
Quantus™ NGS Starter Package	1 each	E5150

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Quantus™ NGS Starter Package provides you with highly sensitive and easy-to-use DNA quantitation for your NGS applications all in one discounted bundle. Contents include a Quantus™ Fluorometer (Cat.# E6150); QuantiFluor® ONE dsDNA System (Cat.# E4870) and enough 0.5ml assay tubes for 500 reactions.

The Quantus™ Fluorometer is a compact and easy-to-operate instrument designed for highly sensitive fluorescent detection of nucleic acids. The Quantus™ Fluorometer is optimized with preprogrammed settings for Promega QuantiFluor® Dye Systems (QuantiFluor® dsDNA, RNA, ssDNA Systems) for nucleic acid quantitation and allows you the flexibility to create your own methods and quantitation settings for other dyes.

The QuantiFluor® ONE dsDNA System provides a fluorescent double-stranded DNA-binding dye in an "add-and-read" format for both dye and standard, simplifying DNA quantitation and speeding up your workflow. It's as easy to use as NanoDrop® absorbance-based methods but much more sensitive for low-concentration samples.

Features:

- **Integrated Instrumentation and Assay:** The QuantiFluor® dyes are optimized for high sensitivity, broad dynamic range and target specificity on the Quantus™ Fluorometer.
- **Simple Measurement:** Add-and-read format makes measuring low concentrations of dsDNA simple—no dilutions, no extra tubes.
- **Increased Sensitivity:** Significantly increased sensitivity over absorbance at 260nm for low-concentration samples.
- **High Specificity to dsDNA:** Minimal binding to ssDNA, RNA, protein and interfering compounds.
- **Affordable Price:** Cost-effective to easily incorporate into your laboratory.
- **Recommended for Next-Gen Sequencing:** Successfully used in several NGS systems including Illumina (HiSeq/miSeq), Roche (454) and LifeTech (ion Torrent and ion Proton) systems.

Storage Conditions: Store QuantiFluor® ONE dsDNA Dye and QuantiFluor® ONE Lambda DNA at –30°C to +10°C. Store 1X TE Buffer at –30°C to +30°C.

Luminometers

GloMax® Discover System

Product	Size	Cat.#
GloMax® Discover System	1 each	GM3000
Available Separately		
Light Plate, ABS/Fluor	1 each	E6532
GloMax® Dual Injectors with Pumps	1 each	GM3030
GloMax® Discover Luminescence Filter Paddle	1 each	GM3011
GloMax® Discover Fluorescence Filter Paddle	1 each	GM3012
GloMax® Discover or Explorer Installation Qualification	1 each	SA1104
GloMax® Discover or Explorer Operational Qualification	1 each	SA1105
GloMax® Discover or Explorer Installation and Operational Qualification	1 each	SA1106
GloMax® Discover or Explorer Instrument Rental, 1 month	1 each	SA1098
GloMax® Discover Standard Service Agreement	1 each	SA4000
GloMax® Discover or Explorer Preventive Maintenance	1 each	SA4030
GloMax® Discover 96 Half-Position Aperture Assembly	1 each	GM1050

E6532, GM3000, GM3030, GM3011, GM3012, GM1050 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The GloMax® Discover System is a high-performance multimode detection instrument developed with Promega reagent chemistries to provide a simple means of detecting advanced chemistries. This instrument provides superior luminescence sensitivity and dynamic range for both strong and weak bioluminescence experimental samples, as well as a seamless integration with Promega bioluminescent assays. GloMax® Discover also provides flexible use of filters for fluorescence intensity, BRET, FRET, filtered luminescence and UV-visible absorbance measurements.

The instrument is operated by an integrated Tablet PC, which provides quick and easy navigation through the control options. Exporting your results is made seamless with a variety of options, including exporting to your local data network. The GloMax® Discover software will provide many of the required technical elements of a part 11 compliant system (user authentication and authorization, data integrity and protection, electronic signatures and audit trails) when used with the appropriate laboratory workflow.

Features:

- **Full Range Capabilities:** Luminescence, fluorescence, BRET, FRET, and UV-visible absorbance detection.
- **Integrated with Promega Assays:** Developed and optimized with Promega cell and gene reporter assays for seamless workflow; you will be up and running faster.
- **Easy-to-Use:** Simple Tablet PC touch screen navigation with full PC capabilities and a state-of-the-art graphical user interface.
- **Superior Performance:** Broader dynamic range, better sensitivity and lower well-to-well cross talk for more usable data from your experiment.
- **Connected to Your Workflow:** Use as a standalone instrument or integrate into your high-throughput automated workflow; export data to your laboratory network.

GloMax® Discover and GloMax® Explorer Systems.

GloMax® Explorer System

Product	Size	Cat.#
GloMax® Explorer Fully Loaded Model	1 each	GM3500
GloMax® Explorer with Luminescence and Fluorescence	1 each	GM3510
Available Separately		
GloMax® Explorer Absorbance Module Upgrade	1 each	GM3520
Light Plate, ABS/Fluor	1 each	E6532
GloMax® Dual Injectors with Pumps	1 each	GM3030
GloMax® Discover Fluorescence Filter Paddle	1 each	GM3012
GloMax® Discover or Explorer Installation Qualification	1 each	SA1104
GloMax® Discover or Explorer Operational Qualification	1 each	SA1105
GloMax® Discover or Explorer Installation and Operational Qualification	1 each	SA1106
GloMax® Explorer Standard Service Agreement	1 each	SA1107
GloMax® Discover or Explorer Instrument Rental, 1 month	1 each	SA1098
GloMax® Discover Standard Service Agreement	1 each	SA4000
GloMax® Discover or Explorer Preventive Maintenance	1 each	SA4030
GloMax® Discover 96 Half-Position Aperture Assembly	1 each	GM1050

GM3500, GM3510, E6532, GM3030, GM3012, GM1050 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The GloMax® Explorer System is a high-performance multimode detection instrument developed with Promega reagents to provide a simple means of detecting advanced chemistries. This instrument provides superior luminescence sensitivity and dynamic range for both strong and weak bioluminescence experimental samples as well as seamless integration with Promega bioluminescence assays.

GloMax® Explorer measures luminescence, fluorescence intensity and visible absorbance. The instrument is operated by an integrated tablet PC, which provides quick and easy navigation through the control options. Exporting your results is easy with a variety of options, including export to your local data network. The GloMax® Explorer software provides many of the required technical elements of a part 11-compliant system (user authentication and authorization, data integrity and protection, electronic signatures and audit trails) when used with the appropriate laboratory workflow.

Features:

- **Flexible Configuration Options:** Luminescence, fluorescence and UV-visible absorbance detection.
- **Integrated with Promega Assays:** Developed and optimized with Promega cell and gene reporter assays for seamless workflow; you will be up and running faster.
- **Easy to Use:** Simple tablet PC touch screen navigation with full PC capabilities and state-of-the-art graphical user interface.
- **Superior Performance:** Broader dynamic range, better sensitivity and lower well-to-well cross talk for more usable data from your experiment.
- **Connect to Your Workflow:** Use as a standalone instrument or integrate into your high-throughput automated workflow.

GloMax® Navigator System

Product	Size	Cat.#
GloMax® Navigator System	1 each	GM2000
GloMax® Navigator System with Dual Injectors and Pumps	1 each	GM2010
Available Separately	**Size**	**Cat.#**
GloMax® Navigator Standard Service Agreement	1 each	SA1301
Dual Injector Pump Station Upgrade for GloMax® Navigator	1 each	SA1304
GloMax® Navigator Installation Qualification	1 each	SA1305
GloMax® Navigator Operational Qualification	1 each	SA1306
GloMax® Navigator Installation and Operational Qualification	1 each	SA1307
GloMax® Navigator Preventive Maintenance	1 each	SA1308

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The GloMax® Navigator System is an easy-to-use microplate luminometer integrated with Promega chemistries for superior assay performance. The system provides researchers superior luminescence sensitivity and dynamic range for both strong and weak bioluminescence experimental samples as well as seamless integration with Promega industry-leading bioluminescent gene reporter, cell-based and biochemical assays.

GloMax® Navigator is operated by an integrated Tablet PC, which provides quick and easy navigation through the control options. Exporting your results is easy with a variety of options, including exporting to your local data network, USB flash drive and cloud-based storage locations. The GloMax® Navigator software provides many of the required technical elements of a part 11-compliant system (user authentication and authorization, data integrity and protection, electronic signatures and audit trails) when used with the appropriate laboratory workflow.

Features:

- **Get Up and Running Faster with Integrated Promega Assays:** Developed and optimized with Promega cell and gene reporter assays for seamless workflow.
- **Enjoy Ease of Use:** Simple tablet PC touch screen navigation with full PC capabilities and state-of-the-art graphical user interface.
- **Experience Superior Performance:** Broader dynamic range, better sensitivity and lower well-to-well cross talk for more usable data from your experiment.
- **Spend Less Time Optimizing.**
- **Export Data to your Laboratory Network:** The software provides many of the required technical elements of a part 11-compliant system (user authentication and authorization, data integrity and protection, electronic signatures and audit trails) when used with the appropriate laboratory workflow.

Storage Conditions: Store at 4–50°C under noncondensing conditions and up to 75% humidity.

Available in the Helix® on-site stocking system

Section Contents

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Available in the Helix® on-site stocking system

GloMax® 20/20 Luminometer

Product	Size	Cat.#
GloMax® 20/20 Luminometer	1 each	E5311
GloMax® 20/20 Luminometer w/Single Auto-Injector	1 each	E5321
GloMax® 20/20 Luminometer w/Dual Auto-Injector	1 each	E5331
Available Separately		
GloMax® 20/20 Light Standard	1 each	E5341
GloMax® 20/20 Fluorescent Module, UV	1 each	E5351
GloMax® 20/20 Fluorescent Module, Blue	1 each	E5361
Thermal Printer Paper	1 each	E2851
GloMax® 20/20 Test Tube Holder (1.5ml Microcentrifuge Tubes)	1 each	E5371
GloMax® 20/20 Replacement Tubing (2), Valves (4), Tips (30)	1 each	E4851
GloMax® 20/20 Replacement Valves	4 sets	E5391
GloMax® 20/20 Replacement Power Supply	1 each	E5411
Thermal Serial Printer and Universal Power Cable	1 each	E2821
GloMax® 20/20 Base Instrument Service Agreement	1 each	SA3000
GloMax® Injectors Service Agreement, 1 year	1 each	SA3040
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The GloMax® 20/20 Luminometer is an ultrasensitive, versatile and affordable luminometer designed for use with any Promega bioluminescent assay. The touch screen interface provides comprehensive instrument control and data collection. Optional modules for fluorescence detection provide additional flexibility.

The option of an internal auto-injection system is an added convenience and meets the demands of the Dual-Luciferase® Assay. Software setup wizards guide the user through a brief process when establishing new protocols. New users can set up protocols and operate the instrument without a steep learning curve. Promega protocols are preloaded in the software to help users get started. The user can quickly select the protocol of interest and begin running assays directly to an Excel® spreadsheet, where data can be analyzed quickly and easily.

Features:

- **Ultrasensitivity:** Quantitate low-level luminescence samples with confidence.
- **Wide Dynamic Range:** Measure both dim and bright samples without sample dilution.
- **Easy Protocol Setup:** Promega protocols are preloaded for easy implementation.
- **Accessible Injector System:** Completely visible plumbing allows inspection of tubing and tips.
- **Touch Screen Interface:** Simple to operate.
- **Convenient Data Handling:** Record data to a printer in real-time or export data to Excel®.
- **Flexibility:** Options available for up to two auto-injectors to meet your experimental needs.

GloMax® 20/20 Luminometer.

Promega

Clinical Laboratory Products

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Clinical Laboratory Products

Products tagged with the Helix® icon are available for distribution through our convenient on-site stocking program in a freezer, refrigerated unit or an ambient cabinet.

For more information visit: **www.promega.com/helix**

Available in the Helix® on-site stocking system

Purification

Maxwell® CSC Instrument

Product	Size	Cat.#
Maxwell® CSC Instrument	1 each	AS6000
Available Separately		
RSC/CSC Plungers	50/pack	AS1331
RSC/CSC Deck Tray	1 each	SP6019

AS6000 For In Vitro Diagnostic Use. This product is only available in certain countries. SP6019, AS1331 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Maxwell® Clinical Sample Concentrator (CSC) Instrument provides automated nucleic acid purification for a range of clinical sample types. The purification methods use sample lysis and binding to paramagnetic particles as the primary separation principle. Up to 16 samples can be prepared in a single run.

Features:Performance

- **Reduce Errors:** Minimal steps with automation.
- **Get Results Faster:** DNA from blood with 38-minute processing time.
- **Reduce Repeat Testing:** High-purity, high-concentration nucleic acid from blood.
- **Eliminate Contamination:** Particle processing technology combined with UV light for sanitization.
- **Spend Less Money:** Less expensive in terms of instrument and per prep price.
- **Do More with Less Space:** Small footprint.

Software

- **Simple Sample Tracking and Document Control:** Integrated bar code reader.
- **Easy to Use:** Controlled via Windows® 10 on tablet with touch screen interface.
- **Benefit from Advanced Administrator Options.**
- **Update Method Easily:** Improved functionality for new method import.

Regulatory

- **Simplify Validation and Improve Reliability:** QSR-manufactured, CSC-labeled (including software).
- **Be Prepared for Audits:** Design master file.
- **Count on World-Class Service and Support to Ensure Minimal Instrument Downtime:** IQ/OQ service options.

Maxwell® CSC Service and Support Products

Product	Size	Cat.#
Maxwell® CSC Standard Service Agreement	1 each	SA1110
Maxwell® CSC Premier Service Agreement	1 each	SA1120
Maxwell® CSC Preventive Maintenance	1 each	SA1130
Maxwell® CSC Installation Qualification	1 each	SA1140
Maxwell® CSC Operational Qualification	1 each	SA1150
Maxwell® CSC IQ/OQ Combination Package	1 each	SA1160

This product is only available in certain countries.

Description: Upon purchase of the Maxwell® CSC Instrument, the instrument will be covered by a one-year Premier Warranty. The **Premier Warranty** covers all parts, labor and shipping to and from our depot repair location (including a loaner instrument arriving at your lab within 1 working day) or onsite repair by a factory-trained service technician arriving within 2 business days. We will repair your instrument and return it to you performing to original factory specifications. The Premier Warranty also includes one preventive maintenance visit.

Once the initial one-year warranty has expired, there are several options for continuing service coverage:

Maxwell® CSC Standard Service Agreement (SA1110): The Standard Service Agreement covers all parts, labor and shipping to and from our depot repair location as well as a loaner instrument upon request. If your Maxwell® CSC Instrument needs repair, we will provide a box for shipment of the instrument back to our service facility. We will repair it and return it performing to original factory specifications. Preventive maintenance visits are available separately.

Maxwell® CSC Premier Service Agreement (SA1120): The Premier Service Agreement includes all parts, labor and shipping to and from our depot repair location (including a loaner instrument arriving at your lab within 1 working day) or an onsite service visit by a factory-trained service technician within 2 business days. Additionally, it includes one annual preventive maintenance visit per year. Additional preventive maintenance visits are available separately.

Maxwell® CSC Preventive Maintenance (SA1130): In order to keep the system operation at peak performance, Promega recommends that Maxwell® CSC Instruments receive a Preventive Maintenance check after 12 months of use. During this procedure, our qualified service personnel test the instrument, check consumable parts for wear and replace them as needed. Additionally, the system is aligned and performance is verified. Documentation for your files is provided. The preventive maintenance service is performed by returning the instrument to an authorized service center. Onsite service is available for an additional charge.

Maxwell® CSC Installation Qualification and Operational Qualification (Cat.# SA1140, SA1150, SA1160)

The Installation Qualification service product includes a series of formal instrument checks, delivers written documentation of instrument functionality and demonstrates that everything ordered with the instrument is supplied and installed at the customer's laboratory. This service product must be delivered by a Promega representative who is certified to perform the Installation Qualification. The service product involves a site visit to perform:

- installation by qualified Promega personnel
- inspection of shipping containers, instrument and accessories
- comparison of items received against items on the purchase order
- inspection of laboratory conditions (power, etc.)
- review of all hazards and precautions with users
- confirmation/installation of correct software version
- instrument test run
- documentation of Installation Qualification.

The Operational Qualification service product demonstrates that the instrument functions according to its operational specifications. This service product must be delivered by a Promega representative who is certified to perform the Operational Qualification. The service product involves a site visit to:

- run operational verification tests
- document all calibration and test results
- train customer(s) to operate the instrument
- train customer(s) to use the log book
- complete Operation Qualification documentation.

Features:

- **Fixed-Cost Service Products:** Predictable support expenditures.
- **Factory-Trained Service Specialists:** Consistent and reliable service.
- **Ongoing System Documentation:** Audit tracing and compliance.
- **Comprehensive Service and Support:** Minimal instrument downtime.

Maxwell® CSC Blood DNA Kit

Product	Size	Cat.#
Maxwell® CSC Blood DNA Kit	48 preps	AS1321

For In Vitro Diagnostic Use. This product is only available in certain countries.

Description: The Maxwell® CSC Blood DNA Kit is intended for use as an in vitro diagnostic (IVD) medical device, in combination with the Maxwell® CSC Instrument and Maxwell® CSC blood DNA purification method, to perform automated isolation of genomic DNA from human whole blood samples. The purified DNA is suitable for use in amplification-based in vitro diagnostic assays.

Features:

- Purifies DNA from whole blood samples collected in tubes containing EDTA, heparin or sodium citrate anticoagulants.
- Designed for use with the Maxwell® CSC Instrument.
- Designed for in vitro diagnostic use.
- Manufactured under cGMP.

Storage Conditions: Store at 15–30°C.

Maxwell® CSC DNA FFPE Kit

Product	Size	Cat.#
Maxwell® CSC DNA FFPE Kit	48 preps	AS1350

For In Vitro Diagnostic Use. This product is only available in certain countries.

Description: The Maxwell® CSC DNA FFPE Kit is intended for use, in combination with the Maxwell® CSC Instrument and the Maxwell® CSC DNA FFPE purification method, as an in vitro diagnostic (IVD) medical device to perform automated isolation of DNA from human breast, lung and colon FFPE (formalin-fixed, paraffin-embedded) tissue samples. The purified DNA is suitable for use in amplification-based in vitro diagnostic assays.

Features:

- Extracts high-quality DNA suitable for use in amplification-based in vitro diagnostic assays.
- Provides reliable, consistent nucleic acid extraction at an affordable price.
- In combination with the Maxwell® CSC Instrument, it offers clinical customers a high-quality cGMP-compliant DNA extraction method.
- Purifies human DNA from formalin-fixed, paraffin-embedded (FFPE) colon, breast and lung tissues.

Storage Conditions: Store at 15–30°C.

Maxwell® CSC RNA Blood Kit

Product	Size	Cat.#
Maxwell® CSC RNA Blood Kit	48 preps	AS1410

For In Vitro Diagnostic Use. This product is only available in certain countries.

Description: The Maxwell® CSC RNA Blood Kit is intended for use as an in vitro diagnostic (IVD) medical device, in combination with the Maxwell® CSC Instrument, to provide an easy method for efficient, automated purification of RNA from 2.5ml fresh human whole blood collected in EDTA tubes.

Features:

- Use in amplification-based in vitro diagnostic (IVD) assays.
- Walkaway automated extraction from up to 16 samples in a single run
- High yield, pure and amplifiable RNA from human whole blood. Minimized sample waste and re-runs.
- Rapid processing time. Protocol can be easily completed within single 8-hour shift.

Storage Conditions: Store at 15–30°C.

Maxwell® CSC RNA FFPE Kit

Product	Size	Cat.#
Maxwell® CSC RNA FFPE Kit	48 preps	AS1360

For In Vitro Diagnostic Use. This product is only available in certain countries.

Description: The Maxwell® CSC RNA FFPE Kit is intended for use, in combination with the Maxwell® CSC Instrument and the Maxwell® CSC RNA FFPE purification method, as an in vitro diagnostic (IVD) medical device to perform automated isolation of RNA from human breast, lung and colon FFPE (formalin-fixed, paraffin-embedded) tissue samples. The purified RNA is suitable for use in amplification-based in vitro diagnostic assays.

Features:

- Extracts high-quality RNA suitable for use in amplification-based in vitro diagnostic assays.
- Provides reliable, consistent nucleic acid extraction at an affordable price.
- In combination with the Maxwell® CSC Instrument, it offers clinical customers a high-quality cGMP-compliant RNA extraction method.
- Purifies human RNA from formalin-fixed, paraffin-embedded (FFPE) colon, breast and lung tissues.

Storage Conditions: Store at 15–30°C.

Available in the Helix® on-site stocking system

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Maxwell® RSC Instrument

Product	Size	Cat.#
Maxwell® RSC Instrument	1 each	AS4500
Available Separately		
RSC/CSC Deck Tray	1 each	SP6019
Maxwell® Instrument Bar Code Reader	1 each	AS3200

AS4500, SP6019, AS3200 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Maxwell® Rapid Sample Concentrator (RSC) Instrument is a platform for automated purification of nucleic acid from a range of sample types. The purification methods use sample lysis and binding to paramagnetic particles as the primary separation principle. Up to 16 samples can be prepared simultaneously in 25–60 minutes, depending on sample type.

The Maxwell® RSC Instrument is controlled by a graphical user interface running on a tablet PC. The instrument is supplied with a Quantus™ Fluorometer and integrated software that allows extracted nucleic acid quantification measurements to be captured in the run report along with sample tracking and method run data.

Features:

- **Easy to Use:** Intuitive software and simple validation; very little hands-on time.
- **Automation:** Get to results faster with minimal steps and lower costs.
- **Quantus™ Fluorometer Integration:** Quickly capture extracted nucleic acid concentration values in the run report.
- **Flexible and Efficient Workflow:** Access sample at any point in workflow; consistent performance eliminates reruns.
- **Technology:** Magnetic particles enhance concentration, minimize contamination and provide highly pure and amplifiable nucleic acid ready for downstream analysis.
- **Small Footprint:** Do more in less space.

Maxwell® RSC System DNA Purification Kits

Product	Size	Cat.#
Maxwell® RSC Blood DNA Kit	48 preps	AS1400
Maxwell® RSC Whole Blood DNA Kit	48 preps	AS1520
Maxwell® RSC DNA FFPE Kit	48 preps	AS1450
Maxwell® RSC Cell DNA Purification Kit	48 preps	AS1370
Maxwell® RSC ccfDNA Plasma Kit	48 preps	AS1480
Maxwell® RSC Buccal Swab DNA Kit	48 preps	AS1640
Maxwell® RSC Stabilized Saliva DNA Kit	48 preps	AS1630
Maxwell® RSC Tissue DNA Kit	48 preps	AS1610
Maxwell® RSC Cultured Cells DNA Kit	48 preps	AS1620
Maxwell® RSC Buffy Coat DNA Kit	48 preps	AS1540
Available Separately		
Microtubes, 1.5ml	1,000 /bag	V1231
ClickFit Microtube, 1.5ml	1,000 /pack	V4741
CTAB Buffer	100 ml	MC1411

MC1411 Not For Medical Diagnostic Use. All others For Research Use Only. Not for Use in Diagnostic Procedures.

Description: These kits can be used for automated DNA purification with the Maxwell® RSC Instrument:

Maxwell® RSC Blood DNA Kit

- Extracts DNA from whole blood or buffy coat samples in 30–40 minutes.
- Processes up to 400µl of whole blood.
- Yields up to 15µg of gDNA, depending on white blood cell count.

Maxwell® RSC Whole Blood DNA Kit

- Extracts DNA from 50–500µl of whole blood in less than 40 minutes.
- Simple, walkaway protocol with no preprocessing.
- Compatible with blood stored in EDTA, heparin and citrate anticoagulants.

Maxwell® RSC DNA FFPE Kit

- Extracts amplifiable DNA from FFPE tissue sections.
- Eliminates the use of hazardous organic solvents.
- Purified DNA performs better in downstream applications.

Maxwell® RSC Cell DNA Purification Kit

- Extracts DNA from samples containing less than 10,000 cells.
- Compatible with low-cell-number samples such as amniotic fluid, cerebral spinal fluid and cell supernatants.
- Cells are collected and processed in up to 400µl volumes, and extraction is complete in about 30 minutes.

Maxwell® RSC ccfDNA Plasma Kit

- Simple, walkaway protocol with no preprocessing.
- Provides high yields of pure and amplifiable ccfDNA.
- Scalable protocol, process ccfDNA from 0.2–1ml of plasma.

Maxwell® RSC Buccal Swab DNA Kit

- Optimized reagents for buccal swab extraction.
- Decreased hands-on time with simple protocol.
- Consistent results with sufficient DNA for HLA assays.

Maxwell® RSC Stabilized Saliva DNA Kit

- Simple protocol with optimized reagents.
- Consistent DNA yields.
- DNA ready to use in downstream assays such as HLA typing.

Maxwell® RSC Tissue DNA Kit

- Extracts DNA from up to 50mg of mammalian tissue.
- Purifies high yields of amplifiable DNA.
- Automated protocol improves efficiency.

Maxwell® RSC Cultured Cells DNA Kit

- Extracts DNA from up to 5×10^6 mammalian tissue culture cells and 2×10^9 bacterial cells.
- Simple, walkaway protocol requires no sample preprocessing.
- Purified DNA is ready for analysis in about 45 minutes.

Maxwell® RSC Buffy Coat DNA Kit

- Purifies high yields of DNA from 50–250µl of buffy coat samples in about 50 minutes.
- Simple walkaway protocol with no preprocessing.
- Compatible with blood stored in EDTA, heparin and citrate anticoagulants.

Maxwell® RSC System RNA Purification Kits

Product	Size	Cat.#
Maxwell® RSC miRNA Tissue Kit	48 preps	AS1460
Maxwell® RSC RNA FFPE Kit	48 preps	AS1440
Maxwell® RSC simplyRNA Cells Kit	48 preps	AS1390
Maxwell® RSC miRNA Plasma and Serum Kit	48 preps	AS1680
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: These kits can be used for automated RNA purification with the Maxwell® RSC Instrument.

Maxwell® RSC miRNA Tissue Kit

- Purifies total RNA, including miRNA, from mammalian tissue samples
- Eliminates use of hazardous organic solvents.

Maxwell® RSC RNA FFPE Kit

- Purifies amplifiable RNA from FFPE tissue samples.
- Eliminates use of hazardous organic solvents.

Maxwell® RSC simplyRNA Cells Kit

- Purifies total RNA from fresh or frozen cells in under an hour.
- Reduces pre-extraction sample handling to 4 steps.

Maxwell® RSC miRNA Plasma and Serum Kit

- High-quality, amplifiable RNA from plasma, serum or enriched exosomes
- Simple, safe RNA extraction without organic reagents
- Automated RNA extraction of 1–48 samples in a single run

Maxwell® RSC Service and Support Products

Product	Size	Cat.#
Maxwell® RSC Premier Warranty Upgrade	1 each	SA1341
Maxwell® RSC Standard Service Agreement	1 each	SA1342
Maxwell® RSC Premier Service Agreement	1 each	SA1343
Maxwell® RSC Preventive Maintenance	1 each	SA1346
Maxwell® RSC Installation Qualification	1 each	SA1347
Maxwell® RSC Operational Qualification	1 each	SA1348
Maxwell® RSC IQ/OQ Combination Package	1 each	SA1349

For additional information see page 293.

Available in the Helix® on-site stocking system

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Available in the Helix® on-site stocking system

Maxwell® 16 Viral Total Nucleic Acid Purification Kit

Product	Size	Cat.#
Maxwell® 16 Viral Total Nucleic Acid Purification Kit	48 preps	AS1150
Maxwell® 16 Viral Total Nucleic Acid Purification System (IVD)	48 preps	AS1155

AS1150 For Laboratory Use. AS1155 For In Vitro Diagnostic Use. This product is only available in certain countries.

For additional information see page 154.

ReliaPrep™ gDNA Tissue Miniprep System

Product	Size	Cat.#
ReliaPrep™ gDNA Tissue Miniprep System	100 preps	A2051
	250 preps	A2052

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ReliaPrep™ gDNA Tissue Miniprep System provides a complete, ready-to-use method for purification of gDNA from up to 25mg of tissue, a buccal (cheek) swab, or a 1cm mouse tail snip, obtaining intact gDNA without the use of ethanol washes or precipitations.

Features:

- **Easy to Use:** Reagents are supplied "ready-to-use"—no additions required.
- **Save Time:** Eluted DNA obtained in 30 minutes or less (hands-on time).
- **No Ethanol:** Eliminates alcohol inhibition and carryover.
- **Pure gDNA:** Improved A_{260}/A_{230} ratios vs. the leading competitor.
- **Peace of Mind:** Consistent results from run to run and between users.
- **Concentrated DNA:** Good recovery and purity in as little as 50µl elution.

Storage Conditions: Store at 15–30°C.

ReliaPrep™ FFPE gDNA Miniprep System

Product	Size	Cat.#
ReliaPrep™ FFPE gDNA Miniprep System	10 reactions	A2351
	100 reactions	A2352
Available Separately		
Microtubes, 1.5ml	1,000 /bag	V1231
ClickFit Microtube, 1.5ml	1,000 /pack	V4741

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ReliaPrep™ FFPE gDNA Miniprep System provides a complete, all-inclusive method for purifying quality genomic DNA from formalin-fixed paraffin-embedded tissue without using hazardous solvents or overnight digestion. Genomic DNA can be isolated from FFPE tissue in approximately two and one-half hours with minimal hands-on time.

Features:

- **Isolate Quality, Intact gDNA:** Optimized lysis and binding conditions reverse modifications introduced by the fixation process, resulting in intact, amplifiable gDNA.
- **Safely Deparaffinize Your Sample:** Deparaffinization step occurs without harsh organic solvents.
- **Save Time:** Purify gDNA from FFPE tissue in less than two and one-half hours with minimal hands-on time. No overnight digestion required.
- **Easy to Use:** Minimal preparation time; simply add ethanol and go!

Storage Conditions: Store at room temperature.

ReliaPrep™ miRNA Cell and Tissue Miniprep System

Product	Size	Cat.#
ReliaPrep™ miRNA Cell and Tissue Miniprep System	10 preps	Z6210
	50 preps	Z6211
	250 preps	Z6212

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: ReliaPrep™ miRNA Cell and Tissue Miniprep System provides complete isolation of total RNA, including microRNA (miRNA) and other small non-coding RNA (sncRNA) subspecies, from a wide variety of cell and tissue types as quickly as 40 minutes. The proprietary column/binding matrix can efficiently capture total RNA, including miRNA, from very small amounts of input material. Using this membrane-based purification system, 1×10^2 to 1×10^6 cultured cells or 0.25–20mg of tissue can be processed per purification. The system incorporates a DNase treatment step, which effectively removes substances that can inhibit downstream assays.

Features:

- **Easily Extract Total RNA in 40 Minutes:** Experience superior ease of use compared to competitive purification chemistries; whether you're a novice or an expert, 40-minute protocol reliably extracts total RNA, including miRNA.
- **Eliminate Harsh Organic Reagents:** Bring your miRNA extraction out of the hood and onto your bench. Save money by eliminating the costly disposal of hazardous organic waste.
- **Isolate Pure RNA:** Consistently isolate pure total RNA, including miRNA and other small non-coding RNAs, through an optimized chemistry.
- **Work with Low Elution Volumes:** Extract high concentrations of amplifiable mRNA, miRNA and other small non-coding RNA in elution volumes that meet the needs of your downstream assays.

Storage Conditions: Store at 15–30°C.

ReliaPrep™ FFPE Total RNA Miniprep System

Product	Size	Cat.#
ReliaPrep™ FFPE Total RNA Miniprep System	10 reactions	Z1001
	100 reactions	Z1002
Available Separately		
Microtubes, 1.5ml	1,000 /bag	V1231
ClickFit Microtube, 1.5ml	1,000 /pack	V4741

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ReliaPrep™ FFPE Total RNA Miniprep System provides a complete, all-inclusive method for purification of quality total RNA from formalin-fixed paraffin-embedded tissue without using hazardous solvents or overnight digestion. Total RNA can be isolated from FFPE tissue in approximately one and one-half hours with minimal hands-on time.

Features:

- **Easy to Use:** Minimal preparation time.
- **Safe:** Deparaffinization step occurs without harsh organic solvents.
- **Isolate Quality, Intact Total RNA:** Fine-tuned protocol results in high-quality, intact, amplifiable total RNA.

Storage Conditions: Store at room temperature.

ReliaPrep™ RNA Miniprep Systems

Product	Size	Cat.#
ReliaPrep™ RNA Cell Miniprep System	10 preps	Z6010
	50 preps	Z6011
	250 preps	Z6012
ReliaPrep™ RNA Tissue Miniprep System	10 preps	Z6110
	50 preps	Z6111
	250 preps	Z6112

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ReliaPrep™ RNA Miniprep Systems provide a fast and simple technique for preparation of intact total RNA from cultured cells or tissue in as little as 30 minutes. The proprietary column/binding matrix can efficiently capture RNA from very small amounts of input material, isolating RNA eluted in a minimal volume (less than 15µl). Using this membrane-based purification system, from 100 to 5×10^6 cultured cells or 0.25 to 20mg of tissue can be processed per purification. The system incorporates a DNase treatment step directly on the minicolumn membrane and effectively removes substances that can inhibit downstream assays. Purification is achieved without the use of phenol:chloroform extractions or ethanol precipitations, resulting in pure RNA that does not require additional purification or concentration of the RNA for use in demanding applications.

Features:

- **Be Efficient:** Allows use of precious samples.
- **Have Confidence:** Provides maximum sensitivity for downstream assays without worry of inhibition when measuring low-copy-number targets.
- **Save Effort:** No need to further concentrate samples for use.
- **Save Time:** Rapid protocol and provided DNase reagents streamline laboratory processes.

Storage Conditions: Store at 15–30°C.

Available in the Helix® on-site stocking system

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Quantification

Quantus™ Fluorometer

Product	Size	Cat.#
Quantus™ Fluorometer	1 each	E6150
Available Separately		
0.5ml PCR Tubes	50 pack	E4941
	200 pack	E4942
Quantus™ Instrument Standard Service Agreement	1 each	SA4040

E4941, E6150, E4942 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Quantus™ Fluorometer is a dual-channel fluorometer for your quantitation workflow. Designed to provide highly sensitive fluorescent detection when quantifying nucleic acids, the compact instrument is simple to operate. The Quantus™ Fluorometer is optimized with preprogrammed settings for Promega QuantiFluor® Dye Systems (QuantiFluor® dsDNA, RNA and ssDNA Systems) to quantitate nucleic acids and offers the flexibility to create customized methods and quantitation settings for other fluorescent dyes.

The Quantus™ Fluorometer is equipped with two fluorescence channels for nucleic acid and protein quantitation:

- Blue fluorescence channel: Excitation 495nm shortpass (wavelengths up to 495nm), emission 510–580nm.
- Red fluorescence channel: Excitation 640nm shortpass (wavelengths up to 640nm), emission 660–720nm.

Features:

- **Experience High Performance:** Integrated with QuantiFluor® Dyes for high sensitivity, broad dynamic range and target specificity. Great for low-level sample quantitation such as FFPE or viral samples.
- **Achieve Increased Sensitivity:** Significantly increased sensitivity over absorbance at 260nm (NanoDrop® spectrophotometer) for those samples that are low in concentration. Ten times more sensitive than Qubit® 2.0 and a detection limit of 50pg/ml, compared to 500pg/ml for the Qubit® 2.0. With a customized low standard curve, lower amounts can be detected.
- **Implement Easy-to-Use Workflow and Navigation:** Flexible with custom protocols and user-defined settings. PC software for data management workflow.
- **Easily Incorporate into Your Laboratory:** Affordable price is very cost-effective.
- **Use for Next-Gen Sequencing:** Successfully used in several Next-Gen Sequencing systems, including Illumina (HiSeq/miSeq), Roche (454) and LifeTech (ion Torrent and ion Proton) systems.

Quantus™ NGS Starter Package

Product	Size	Cat.#
Quantus™ NGS Starter Package	1 each	E5150

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Quantus™ NGS Starter Package provides you with highly sensitive and easy-to-use DNA quantitation for your NGS applications all in one discounted bundle. Contents include a Quantus™ Fluorometer (Cat.# E6150); QuantiFluor® ONE dsDNA System (Cat.# E4870) and enough 0.5ml assay tubes for 500 reactions.

The Quantus™ Fluorometer is a compact and easy-to-operate instrument designed for highly sensitive fluorescent detection of nucleic acids. The Quantus™ Fluorometer is optimized with preprogrammed settings for Promega QuantiFluor® Dye Systems (QuantiFluor® dsDNA, RNA, ssDNA Systems) for nucleic acid quantitation and offers flexibility to create customized methods and quantitation settings for other dyes.

The QuantiFluor® ONE dsDNA System provides a fluorescent double-stranded DNA-binding dye in an "add-and-read" format for both dye and standard, simplifying DNA quantitation and speeding up your workflow. It's as easy to use as NanoDrop® absorbance-based methods but much more sensitive for low-concentration samples.

Features:

- **Employ Integrated Instrumentation and Assay:** The QuantiFluor® dyes are optimized for high sensitivity, broad dynamic range and target specificity on the Quantus™ Fluorometer.
- **Measure Low dsDNA Concentrations:** Add-and-read format makes measuring low concentrations of dsDNA simple—no dilutions, no extra tubes.
- **Notice Increased Sensitivity:** Significantly increased sensitivity over absorbance at 260nm (NanoDrop spectrophotometer) for those samples that are low in concentration.
- **Expect High Specificity to dsDNA:** Minimal binding to ssDNA, RNA, protein and interfering compounds.
- **Spend Less Money:** Cost-effective to easily incorporate into your laboratory.
- **Use for Next-Gen Sequencing:** Successfully used in several NGS systems including Illumina (HiSeq/miSeq), Roche (454) and LifeTech (ion Torrent and ion Proton) systems.

Storage Conditions: Store QuantiFluor® ONE dsDNA Dye and QuantiFluor® ONE Lambda DNA at –30°C to +10°C. Store 1X TE Buffer at –30°C to +30°C.

QuantiFluor® ONE dsDNA System

Product	Size	Cat.#
QuantiFluor® ONE dsDNA System	100 reactions	E4871
	500 reactions	E4870
Available Separately		
K562 Genomic DNA	80 µg	E4931
0.5ml PCR Tubes	50 pack	E4941
	200 pack	E4942

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The QuantiFluor® ONE dsDNA System contains a fluorescent double-stranded DNA-binding dye (504nm$_{Ex}$/531nm$_{Em}$) developed for use in an "add-and-read" format for dye and standard, making sample quantitation easy. This system enables sensitive quantitation of small amounts of double-stranded DNA (dsDNA).

The QuantiFluor® ONE dsDNA System was developed using the fluorescence module of the GloMax® Multi+ Detection System with Instinct® Software, GloMax® Discover System and the Quantus™ Fluorometer. The QuantiFluor® ONE dsDNA System can be used with any fluorometer that is capable of measuring fluorescence at the appropriate excitation and emission wavelengths.

Features:

- **Perform No Dilutions; Use No Extra Tubes:** Add-and-read format makes this dye simple to use.
- **Increase Your Sensitivity:** Significantly increased sensitivity compared to absorbance at 260nm (NanoDrop® spectrophotometer), allowing you to quantitate low-concentration samples with confidence.
- **Experience Minimal Binding:** Highly specific to dsDNA; minimal binding to ssDNA, RNA, protein and interfering compounds.
- **Take Advantage of Flexible Instrumentation:** Integrated on Quantus™ and GloMax® detection instruments, yet compatible with any fluorometer capable of measuring the appropriate fluorescence excitation and emission spectra.

Storage Conditions: Store the QuantiFluor® ONE dsDNA Dye and QuantiFluor® ONE Lambda DNA at –30°C to +10°C. Store the 1X TE Buffer at –30°C to +30°C.

QuantiFluor® dsDNA System

Product	Size	Cat.#
QuantiFluor® dsDNA System	1 ml	E2670
QuantiFluor® dsDNA Sample Kit	1 each	E2671
Available Separately		
0.5ml PCR Tubes	50 pack	E4941
	200 pack	E4942

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The QuantiFluor® dsDNA System contains a fluorescent DNA-binding dye that enables sensitive quantitation of small amounts of double-stranded DNA (dsDNA) in solution. The quantitation of dsDNA is a very important step in many biological applications, particularly in standard molecular biology techniques. The dye shows minimal binding to single-stranded DNA (ssDNA) and RNA, allowing specific quantitation of dsDNA.

Features:

- **Experience Minimal Binding:** Highly specific to dsDNA; minimal binding to ssDNA, RNA, protein and interfering compounds.
- **Increase Your Sensitivity:** Significantly increased sensitivity compared to absorbance at 260nm (NanoDrop® spectrophotometer) for low-concentration samples. Performs better or equal to PicoGreen® dye and can detect as little as 50pg/ml.
- **Set Up Quickly and Easily:** System includes all required reagents to quickly set up and quantitate dsDNA.
- **Use with Promega Instruments:** Pre-optimized on both the Quantus™ Fluorometer and GloMax®-Multi+ Instrument.
- **Use for Next-Gen Sequencing:** Successfully used in several Next-Gen Sequencing systems, including Illumina (HiSeq/miSeq), Roche (454) and LifeTech (ion Torrent and ion Proton) systems.

Storage Conditions: Product may arrive frozen. Upon receipt, store at 2–10°C.

Available in the Helix® on-site stocking system

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QuantiFluor® RNA System

Product	Size	Cat.#
QuantiFluor® RNA System	1 ml	E3310
Available Separately		
0.5ml PCR Tubes	50 pack	E4941
	200 pack	E4942

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Sensitive quantitation of RNA is important for the success of downstream applications. The QuantiFluor® RNA System contains a fluorescent RNA-binding dye that enables sensitive quantitation of small amounts of RNA in solution. Detecting and quantitating small amounts of RNA is a very important step that is used in many biological applications, particularly in molecular biology techniques.

Features:

- **Increase Your Sensitivity:** Significantly increased sensitivity compared to absorbance results on the NanoDrop® spectrophotometer, allowing you to quantitate low-concentration samples with confidence.
- **Save Precious Sample for Downstream Assays:** Less template RNA required than for quantification by spectrophotometry.
- **Experience Flexible Instrument Compatibility:** Use easily on both the QuantiFluor®-ST Fluorometer and GloMax®-Multi Instrument. This system also can be used on any fluorescent instrument with appropriate optical channels.
- **Remain Cost-Effective:** Value priced, robust option for RNA quantitation.
- **Use with Promega Instruments:** Pre-optimized on both the Quantus™ Fluorometer and GloMax®-Multi+ Instrument.

Storage Conditions: Store at –30°C to –10°C, protected from light.

GloMax® Discover System

Product	Size	Cat.#
GloMax® Discover System	1 each	GM3000
Available Separately		
Light Plate, ABS/Fluor	1 each	E6532
GloMax® Dual Injectors with Pumps	1 each	GM3030
GloMax® Discover Luminescence Filter Paddle	1 each	GM3011
GloMax® Discover Fluorescence Filter Paddle	1 each	GM3012
GloMax® Discover or Explorer Installation Qualification	1 each	SA1104
GloMax® Discover or Explorer Operational Qualification	1 each	SA1105
GloMax® Discover or Explorer Installation and Operational Qualification	1 each	SA1106
GloMax® Discover or Explorer Instrument Rental, 1 month	1 each	SA1098
GloMax® Discover Standard Service Agreement	1 each	SA4000
GloMax® Discover or Explorer Preventive Maintenance	1 each	SA4030
GloMax® Discover 96 Half-Position Aperture Assembly	1 each	GM1050

E6532, GM3000, GM3030, GM3011, GM3012, GM1050 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The GloMax® Discover System is a high-performance multimode detection instrument developed with Promega reagent chemistries to provide a simple means of detecting advanced chemistries. This instrument provides superior luminescence sensitivity and dynamic range for both strong and weak bioluminescence experimental samples, as well as a seamless integration with Promega bioluminescent assays. GloMax® Discover also provides flexible use of filters for fluorescence intensity, BRET, FRET, filtered luminescence and UV-visible absorbance measurements.

The instrument is operated by an integrated Tablet PC, which provides quick and easy navigation through the control options. Exporting your results is made seamless with a variety of options, including exporting to your local data network. The GloMax® Discover software will provide many of the required technical elements of a part 11 compliant system (user authentication and authorization, data integrity and protection, electronic signatures and audit trails) when used with the appropriate laboratory workflow.

Features:

- **Full Range Capabilities:** Luminescence, fluorescence, BRET, FRET, and UV-visible absorbance detection.
- **Integrated with Promega Assays:** Developed and optimized with Promega cell and gene reporter assays for seamless workflow; you will be up and running faster.
- **Easy-to-Use:** Simple Tablet PC touch screen navigation with full PC capabilities and a state-of-the-art graphical user interface.
- **Superior Performance:** Broader dynamic range, better sensitivity and lower well-to-well cross talk for more usable data from your experiment.
- **Connected to Your Workflow:** Use as a standalone instrument or integrate into your high-throughput automated workflow; export data to your laboratory network.

GloMax® Discover and GloMax® Explorer Systems.

GloMax® Explorer System

Product	Size	Cat.#
GloMax® Explorer Fully Loaded Model	1 each	GM3500
GloMax® Explorer with Luminescence and Fluorescence	1 each	GM3510
Available Separately		
GloMax® Explorer Absorbance Module Upgrade	1 each	GM3520
Light Plate, ABS/Fluor	1 each	E6532
GloMax® Dual Injectors with Pumps	1 each	GM3030
GloMax® Discover Fluorescence Filter Paddle	1 each	GM3012
GloMax® Discover or Explorer Installation Qualification	1 each	SA1104
GloMax® Discover or Explorer Operational Qualification	1 each	SA1105
GloMax® Discover or Explorer Installation and Operational Qualification	1 each	SA1106
GloMax® Explorer Standard Service Agreement	1 each	SA1107
GloMax® Discover or Explorer Instrument Rental, 1 month	1 each	SA1098
GloMax® Discover Standard Service Agreement	1 each	SA4000
GloMax® Discover or Explorer Preventive Maintenance	1 each	SA4030
GloMax® Discover 96 Half-Position Aperture Assembly	1 each	GM1050

GM3500, GM3510, E6532, GM3030, GM3012, GM1050 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The GloMax® Explorer System is a high-performance multimode detection instrument developed with Promega reagents to provide a simple means of detecting advanced chemistries. This instrument provides superior luminescence sensitivity and dynamic range for both strong and weak bioluminescence experimental samples as well as seamless integration with Promega bioluminescence assays.

GloMax® Explorer measures luminescence, fluorescence intensity and visible absorbance. The instrument is operated by an integrated tablet PC, which provides quick and easy navigation through the control options. Exporting your results is easy with a variety of options, including export to your local data network. The GloMax® Explorer software provides many of the required technical elements of a part 11-compliant system (user authentication and authorization, data integrity and protection, electronic signatures and audit trails) when used with the appropriate laboratory workflow.

Features:

- **Flexible Configuration Options:** Luminescence, fluorescence and UV-visible absorbance detection.
- **Integrated with Promega Assays:** Developed and optimized with Promega cell and gene reporter assays for seamless workflow; you will be up and running faster.
- **Easy to Use:** Simple tablet PC touch screen navigation with full PC capabilities and state-of-the-art graphical user interface.
- **Superior Performance:** Broader dynamic range, better sensitivity and lower well-to-well cross talk for more usable data from your experiment.
- **Connect to Your Workflow:** Use as a standalone instrument or integrate into your high-throughput automated workflow.

Amplification

GenePrint® 24 System

Product	Size		Cat.#
GenePrint® 24 System	100 reactions		B1870
	400 reactions		B1874
Available Separately	**Size**	**Conc.**	**Cat.#**
WEN Internal Lane Standard 500	200 µl		DG5001
GenePrint® 5C Matrix Standard	5 preps		B1930
Water, Amplification Grade	6,250 µl		DW0991
2800M Control DNA	25 µl	10 ng/µl	DD7101

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The *GenePrint*® 24 System is a 24-locus multiplex system designed to generate a multi-locus human DNA profile from a variety of human-derived biological sources. This five-color system allows co-amplification and fluorescent detection of the following autosomal STR loci: CSF1PO, FGA, TH01, TPOX, vWA, D3S1358, D5S818, D7S820, D8S1179, D13S317, D16S539, D18S51, D21S11, D10S1248, D22S1045, D2S441, D1S1656, D12S391, D2S1338, D19S433, Penta D and Penta E plus Amelogenin for gender determination. In addition, the male-specific DYS391 locus is included to identify null Y allele results for Amelogenin.

The *GenePrint*® 24 System is compatible with 2.5 to 5ng of extracted DNA samples and requires fewer PCR cycles in lower reaction volumes than previous STR systems. This is particularly important when optimal heterozygote balance is desired.

The *GenePrint*® 24 System is compatible with the Applied Biosystems® 3130, 3130*xl*, 3500 and 3500xL Genetic Analyzers.

Panels and bins text files are required for automatic assignment of genotypes using the GeneMapper® and GeneMarker® software and are available for download.

Features:

- **Use Specialized Assay:** STR assay specifically for DNA fingerprinting and mixed sample analysis with abundant source material.
- **Obtain Optimal Heterozygote Balance:** Higher sample input for optimal heterozygote balance using up to 5ng of DNA template.
- **Take Advantage of High Power of Discrimination:** Identify unique alleles to resolve complex mixtures from related individuals or multiple sources.
- **Employ Streamlined Workflow:** Improve productivity with rapid cycling and more loci.
- **Simplify Validation:** Simplify validation and continuity using loci in concordance with previously generated data.

Storage Conditions: Store kit at –20°C. Upon receipt, move 2800M Control DNA and WEN ILS 500 to 4°C storage.

PowerPlex® Fusion 6C System

Product	Size		Cat.#
PowerPlex® Fusion 6C System	50 (or 100 direct-amp) reactions		DC2705
	200 (or 400 direct-amp) reactions		DC2720
	800 (or 1,600 direct-amp) reactions		DC2780
Available Separately	**Size**	**Conc.**	**Cat.#**
PowerPlex® 6C Matrix Standard	5 preps		DG4900
WEN Internal Lane Standard 500	200 µl		DG5001
2800M Control DNA	25 µl	10 ng/µl	DD7101

Not For Medical Diagnostic Use.

Description: The PowerPlex® Fusion 6C System is a 27-locus multiplex for human identification applications including forensic analysis, relationship testing and research use. This six-color system allows co-amplification and fluorescent detection of the 18 autosomal loci in the expanded CODIS core loci (CSF1PO, FGA, TH01, vWA, D1S1656, D2S441, D2S1338, D3S1358, D5S818, D7S820, D8S1179, D10S1248, D12S391, D13S317, D16S539, D18S51, D19S433 and D21S11) and Amelogenin and DYS391 for gender determination. The Penta D, Penta E, TPOX, D22S1045 and SE33 loci also are included to increase discrimination and allow searching of databases that include profiles with these loci. Finally, two rapidly mutating Y-STR loci, DYS570 and DYS576, are included in the multiplex.

The PowerPlex® Fusion 6C System works well with extracted DNA samples, including low amounts of template DNA, mixtures and inhibitor-laden samples. The PowerPlex® Fusion 6C System is also compatible with direct amplification, enabling streamlined STR databasing efforts. Amplification can be successfully performed with sample types such as FTA® card punches as well as pretreated swabs, Bode Buccal DNA Collector™ punches or S&S 903 punches. Fast cycling conditions used with the PowerPlex® Fusion 6C System reduce sample-processing time for all samples.

The PowerPlex® Fusion 6C System is compatible with the Applied Biosystems® 3500 and 3500xL Genetic Analyzers as well as Applied Biosystems® 3130 and 3130*xl* Genetic Analyzers with Data Collection Software Version 4.0 with the DC v4 6-Dye Module v1 License (Life Technologies).

Features:

- **Experience Highest Inter-Database Compatibility and Discrimination:** 27 loci (23 autosomal STRs, 3 Y-STRs and Amelogenin); amplify all loci in the expanded CODIS core loci.
- **Streamline Your Workflows:** Use direct-amplification protocols and rapid cycling.
- **Reduce Repeat Analysis of Difficult Samples:** Experience high inhibitor tolerance and sensitivity for casework.
- **Simplify Your Validation and QC:** Use one kit for both casework and database sections.

Storage Conditions: Store all components at –30°C to –10°C. After the first use, store the PowerPlex® Fusion 6C System components at 2–10°C, where components are stable for 6 months. Do not refreeze.

PowerPlex® Fusion System

Product	Size	Cat.#
PowerPlex® Fusion System	200 reactions	DC2402
	800 reactions	DC2408
Available Separately	**Size**	**Conc.** **Cat.#**
2800M Control DNA	25 µl	10 ng/µl DD7101
Water, Amplification Grade	6,250 µl	DW0991
Not For Medical Diagnostic Use.		

Description: The PowerPlex® Fusion System is a 24-locus multiplex for human identification applications including forensic analysis, relationship testing and research use. This five-color system allows co-amplification and fluorescent detection of the 13 core CODIS (US) loci (CSF1PO, FGA, TH01, TPOX, vWA, D3S1358, D5S818, D7S820, D8S1179, D13S317, D16S539, D18S51 and D21S11), the 12 core European Standard Set loci (TH01, vWA, FGA, D21S11, D3S1358, D8S1179, D18S51, D10S1248, D22S1045, D2S441, D1S1656 and D12S391) and Amelogenin for gender determination. In addition, the male-specific DYS391 locus is included to identify null Y allele results for Amelogenin. The Penta D, Penta E, D2S1338 and D19S433 loci are included to increase discrimination and allow searching of databases that include profiles with these popular loci. This extended panel of STR markers is intended to satisfy both CODIS and ESS recommendations.

The PowerPlex® Fusion System works well with extracted DNA samples, including low amounts of template DNA, mixtures and inhibitor-laden samples. The PowerPlex® Fusion System also is compatible with direct amplification, enabling streamlined STR databasing efforts. Amplification can be successfully performed with sample types such as FTA® card punches as well as pretreated swabs, Bode Buccal DNA Collector™ punches or S&S 903 punches. Fast cycling conditions used with the PowerPlex® Fusion System reduce sample-processing time for all samples.

The PowerPlex® Fusion System is compatible with the ABI PRISM® 3100 and 3100-*Avant* Genetic Analyzers and Applied Biosystems® 3130, 3130*xl*, 3500 and 3500xL Genetic Analyzers.

Panels and bins text files are required for automatic assignment of genotypes using the GeneMapper® *ID* and *ID*-X software and are available for download at: **www.promega.com/resources/tools/genemapper-id-software-panels-and-bin-sets/**

The PowerPlex® Fusion System was given NDIS approval in March 2013 for NDIS CODIS databasing.

Features:

- **Highest Interdatabase Compatibility and Discrimination:** 24 loci (23 STRs plus Amelogenin), including the CODIS and ESS required loci. Amplifies all loci found in Identifiler®, SGM Plus® and PowerPlex® 16, some of the most commonly used multiplexes over the last decade.
- **Streamlined Workflows:** Direct-amplification protocols and rapid cycling.
- **Less Repeat Analysis of Difficult Samples:** High inhibitor tolerance and sensitivity for casework.
- **Easier Validation and QC:** One kit for both casework and database sections.

Storage Conditions: Store kit at –20°C. Upon receipt, move 2800M Control DNA to 4°C storage.

PowerPlex® Y23 System

Product	Size	Cat.#
PowerPlex® Y23 System	50 reactions	DC2305
	200 reactions	DC2320
Available Separately	**Size**	**Conc.** **Cat.#**
2800M Control DNA	25 µl	10 ng/µl DD7101
	500 µl	0.25 ng/µl DD7251
Water, Amplification Grade	6,250 µl	DW0991
Not For Medical Diagnostic Use.		

Description: The PowerPlex® Y23 System is a 23-loci, 5-color Y-STR multiplex designed for genotyping forensic casework samples, database samples and paternity samples.

The PowerPlex® Y23 System works well with extracted DNA samples, including low amounts of template and male/female DNA mixtures. The PowerPlex® Y23 System also is compatible with direct amplification, enabling streamlined Y-STR databasing efforts. Amplification can be successfully performed with sample types such as FTA® card punches as well as pretreated swabs, Bode Buccal DNA Collector™ punches or S&S 903 punches.

Faster cycling conditions cut amplification time almost in half. Moreover, reduced sample-processing time and faster cycling conditions provide a significant time savings in every run.

The PowerPlex® Y23 System is tolerant of many known amplification inhibitors. The robust performance of the kit results in more interpretable data from inhibitor-laden samples.

The PowerPlex® Y23 System was given NDIS approval in January 2013.

Features:

- **More Meaningful STR Analysis:** Higher power of discrimination from 23 loci results in fewer false-positive matches.
- **More Usable Profile from Samples with Excess Female DNA:** High sensitivity in the presence of female DNA (<0.1ng male DNA, 1:6,000 ratio).
- **Streamlined Databasing Workflows:** Direct-amplification compatible.
- **Significant Reduction in Amplification Time:** Faster cycling conditions cut amplification time roughly in half.
- **Full Profiles from Challenging Casework Samples:** High tolerance for inhibitors including tannic acid, hematin and humic acid.
- **Simplified Workflows and Inventory:** One kit for both casework and databasing.

Storage Conditions: Upon receipt of kit, remove 2800M Control DNA and store at 4°C. Store all other kit components at –20°C.

Available in the Helix® on-site stocking system

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PCR Optimization Kit and 5X PCR Buffers

Product	Size	Cat.#
PCR Optimization Kit	1 each	D2381
5X PCR Buffer A	1 each	D2301
5X PCR Buffer B	1 each	D2311
5X PCR Buffer C	1 each	D2321
5X PCR Buffer D	1 each	D2331
5X PCR Buffer E	1 each	D2341
5X PCR Buffer F	1 each	D2351
5X PCR Buffer G	1 each	D2361
5X PCR Buffer H	1 each	D2371
For Laboratory Use.		

Description: The PCR Optimization Kit contains a portfolio of preformulated, high-quality buffers (A–H) that together cover a spectrum of PCR performance capabilities for endpoint, multiplex, real-time, GC-rich and inhibitor-resistant amplifications. The kit also contains a tube of 25mM $MgCl_2$ solution and GoTaq® MDx Hot Start Polymerase, providing you a kit of reagents to perform a series of short experiments to quickly survey which combination of PCR buffer, $MgCl_2$ and enzyme concentration yields optimal PCR performance specific for your assay.

Once you identify your optimal PCR formulation, continue your work with a Made-to-Order 2X PCR Master Mix or purchase the stand-alone buffer with $MGCL_2$ and GoTaq® MDx Hot Start Polymerase. Request your Made-to-Order 2X PCR Master Mix at: **www.promega.com/made-to-order**

Features:

- **Accelerate your Assay Development:** Achieve optimized PCR performance without spending a lot of development time to get there. Save yourself time by capitalizing on our 30+ years of PCR experience by starting your assay development and optimization with preformulated buffers that cover a wide variety of PCR performance capabilities.
- **Integrated Quality:** Products are cGMP-manufactured, providing confidence for consistent, lot-to-lot PCR performance.
- **No-Hassle Customization:** Seamlessly transition into daily execution of your PCR assay by continuing your work with a Made-to-Order 2X PCR Master Mix. Simply tell us what your reaction formulation is (which buffer, how much $MgCl_2$ and enzyme you used), and we'll make your personalized 2X PCR Master Mix*.

*Minimum order quantity required for Made-to-Order 2X PCR Master Mixes.

Storage Conditions: Store at –30 to –10°C.

Magnesium Chloride Solution

Product	Size	Conc.	Cat.#
Magnesium Chloride Solution	1.5 ml	25 mM	A3511
	25 ml	25 mM	A3513
For Laboratory Use.			

Description: MgC_{l2} solution supplied at 25mM for PCR optimization.
Storage Conditions: Store at –30°C to –10°C.

GoTaq® MDx DNA Polymerases

Product	Size	Conc.	Cat.#
GoTaq® MDx Hot Start Polymerase	100 u		D6001
	500 u		D6005
GoTaq® MDx Hot Start Polymerase, Glycerol-Free	500 u		D6201
GoTaq® MDx Hot Start Polymerase	2,500 u		D6006
	10,000 u		D6008
GoTaq® MDx DNA Polymerase	100 u	≥5 u/µl	D4001
	500 u	≥5 u/µl	D4005
	2,500 u	≥5 u/µl	D4006
GoTaq® MDx DNA Polymerase, Glycerol-Free	500 u	≥5 u/µl	D4101
GoTaq® MDx Hot Start Polymerase, High Concentration	1,000 u	≥50 u/µl	D6101
For Laboratory Use.			

Description: GoTaq® MDx DNA Polymerase is a full-length form of *Taq* DNA polymerase that exhibits 5′→3′ exonuclease activity. **GoTaq® MDx Hot Start Polymerase** contains GoTaq® MDx DNA Polymerase bound to a proprietary antibody that blocks polymerase activity. The polymerase activity is restored during the initial denaturation step when amplification reactions are heated at 94–95°C for two minutes. This allows hot-start PCR in which polymerase activity is inhibited at temperatures below 70°C, allowing convenient, room-temperature reaction setup. Hot-start PCR is advantageous for some amplification targets because primer-dimer and secondary products are eliminated or minimized. In some cases, hot-start PCR may improve yields.

The glycerol-free product formulation is further purified to remove glycerol, making it suitable for further manufacture processing and lyophilization.

GoTaq® MDx DNA Polymerase products are manufactured under cGMP standards.

GoTaq® MDx DNA Polymerase products are general purpose reagents intended for general laboratory use. They can be used as a component of molecular diagnostic assays, where applicable country laws allow, without paying royalties. The products by themselves do not provide any diagnostic result.

Features:

- Achieve consistent and robust amplification using GoTaq® MDx DNA Polymerase.
- **Use Consistently Performing Enzymes:** cGMP-manufactured using validated equipment, processes and methods under a certified Quality System to ensure consistent product performance lot-to-lot.
- **Work with High-Quality Enzymes Tested for Low DNA Contamination:** QC-tested for bacterial, fungal and mammalian DNA.
- **Take Advantage of our Custom Solutions:** Flexible product formats and formulations available.

To use GoTaq® MDx Hot Start Polymerase in a custom format or to distribute GoTaq® MDx Hot Start Polymerase, contact the Promega Custom Order Department to discuss specific requirements.

Storage Conditions: Store at –30 to –10°C.

GoScript™ Reverse Transcription System

Product	Size	Cat.#
GoScript™ Reverse Transcription System	50 reactions	A5000
	100 reactions	A5001
Available Separately		
GoScript™ Reverse Transcriptase	100 reactions	A5003
	500 reactions	A5004
GoScript™ Reverse Transcription Mix, Oligo(dT)	50 reactions	A2790
	100 reactions	A2791
GoScript™ Reverse Transcription Mix, Random Primers	50 reactions	A2800
	100 reactions	A2801

A5000, A5001, A2790, A2791, A2800, A2801 For Research Use Only. Not for Use in Diagnostic Procedures. A5003, A5004 For Laboratory Use.

Description: The GoScript™ Reverse Transcription System includes a reverse transcriptase and a specialized set of reagents for efficient synthesis of first-strand cDNA optimized for quantitative PCR amplification. GoScript™ Reverse Transcriptase uses M-MLV Reverse Transcriptase and state-of-the-art buffer technology to deliver robust, reliable cDNA synthesis of a full range of rare and abundant transcripts, even in the presence of inhibitors. GoScript™ Reverse Transcriptase is qualified for use in qPCR, including GoTaq® qPCR systems.

Features:

- Available as a standalone enzyme, a complete reverse transcription kit or as a master mix with Oligo(dT) or Random Primers.
- Achieve sensitive transcription of both high-copy and low-copy messages.
- Transcribe short and long transcripts; process through secondary structure.

Storage Conditions: Store at –30°C to –10°C.

PCR Nucleotide Mix

Product	Size	Conc.	Cat.#
PCR Nucleotide Mix	200 µl	10 mM	C1141
	1,000 µl	10 mM	C1145
	200 µl	25mM	U1431
	1,000 µl	25mM	U1432

For Laboratory Use.

Description: High-quality deoxynucleotide triphosphates (dNTPs) are critical for PCR efficacy. The PCR Nucleotide Mix is a premixed solution containing the sodium salts of dATP, dCTP, dGTP and dTTP. PCR Nucleotide Mix is manufactured under cGMP conditions and has equimolar amounts of each dNTP to ensure optimal PCR. Adding dNTPs as a mix also simplifies pipetting steps and reduces the risk of contamination.

There are two ready-to-use formulations available:

- A premixed solution with each nucleotide at a concentration of 10mM in water at pH 7.5; the total concentration of nucleotides is 40mM.
- A premixed solution with each nucleotide at a concentration of 25mM in water at pH 7.5; the total concentration of nucleotides is 100mM.

Features:

- **Optimized and Pretested in PCR:** Equimolar amounts of each dNTP ensure optimal PCR.
- **Convenient:** Add 1µl for 50µl PCR.
- **Easy to Use:** Reduced pipetting steps contribute to ease-of-use and reduce the risk of contamination.
- **Performance Guaranteed:** Promega PCR systems, enzymes and reagents are proven in PCR to ensure reliable, high-performance results. If you are not completely satisfied with any Promega PCR product, we will send a replacement or refund your account.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**
- **cGMP-Manufactured:** Achieve lot-to-lot product consistency.
- **Two Concentrations Available:** 10mM and 25mM.

Storage Conditions: Store at –30°C to –10°C.

Available in the Helix® on-site stocking system

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Deoxynucleotide Triphosphates (dNTPs)

Product	Size	Conc.	Cat.#
dATP	25 µmol	100 mM	U1205
	40 µmol	100 mM	U1201
	200 µmol	100 mM	U1202
dGTP	25 µmol	100 mM	U1215
	40 µmol	100 mM	U1211
	200 µmol	100 mM	U1212
dCTP	25 µmol	100 mM	U1225
	40 µmol	100 mM	U1221
	200 µmol	100 mM	U1222
dTTP	25 µmol	100 mM	U1235
	40 µmol	100 mM	U1231
	200 µmol	100 mM	U1232
Set of dATP, dCTP, dGTP, dTTP	10µmol each	100 mM	U1330
	25 µmol each	100 mM	U1420
	40µmol each	100 mM	U1240
	200 µmol	100 mM	U1410

For Laboratory Use.

Description: High-quality deoxynucleotide triphosphates (dNTPs) are critical for the success of many key procedures such as cDNA synthesis, sequencing and labeling. Promega dNTPs have greater than 99% triphosphate content and are provided at a concentration of 100mM in water at pH 7.5.

Features:

- **Dependable:** PCR-tested deoxynucleotides ensure optimal performance with all Promega amplification enzymes.
- **Consistent:** dNTPs are >99% pure, allowing highly consistent results.
- **Convenient:** Supplied at a convenient concentration (100mM in water) for ease-of-use in PCR and other applications.

Storage Conditions: Store at –30°C to –10°C.

PCR Amplifications From Each Size of Individual dNTPs.

Each catalog number supplies each individual dNTP at 100mM. Reactions are based on 200µM each dNTP in a 50µl reaction.

Cat.#	Quantity	Volume	Reactions
U1330, U1335	10 µmol each	100 µl each	1,000
U1420	25 µmol each	250 µl each	2,500
U1240, U1245	40 µmol each	400 µl each	4,000
U1410	200 µmol each	2 × 1,000 µl each	20,000

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Deoxyuridine Triphosphate (dUTP)

Product	Size	Conc.	Cat.#
dUTP	40 µmol	100 mM	U1191
Set of dATP, dCTP, dGTP, dUTP	10µmol each	100 mM	U1335
	40µmol each	100 mM	U1245

For Laboratory Use.

Description: High-quality deoxynucleotide triphosphates (dNTPs) are critical for the success of many key procedures such as cDNA synthesis, sequencing and labeling. Promega dNTPs have greater than 99% triphosphate content and are provided at a concentration of 100mM in water at pH 7.5.

dUTP (2′-Deoxyuridine, 5′-Triphosphate) can be used in place of dTTP in PCR and RT-PCR protocols to prevent carryover from previous amplifications. The substitution of dUTP for dTTP in PCR results in uracil-containing PCR products that are suitable for most standard applications. The enzyme uracil-N-glycosylase (UNG, also referred to as UDG) can be added to a PCR premix to excise uracil from any contaminating PCR product, thereby preventing false positives. Each lot of dUTP is function-tested to ensure specific DNA amplification and the absence of nuclease activity.

Features:

- **Dependable:** PCR-tested deoxynucleotides ensure optimal performance with all Promega amplification enzymes.
- **Consistent:** dUTP is ≥99% triphosphate, allowing highly consistent results.
- **Convenient:** Supplied at a convenient concentration (100mM in water) for ease-of-use in PCR and other applications.

Storage Conditions: Store at –20°C. Avoid exposure to frequent temperature changes.

RNasin® Ribonuclease Inhibitors

Product	Size	Conc.	Cat.#
RNasin® Ribonuclease Inhibitor	2,500 u	20–40 u/µl	N2111
	10,000 u	20–40 u/µl	N2115
Recombinant RNasin® Ribonuclease Inhibitor	2,500 u	20–40 u/µl	N2511
	10,000 u	20–40 u/µl	N2515
RNasin® Plus RNase Inhibitor	2,500 u	40 u/µl	N2611
	10,000 u	40 u/µl	N2615

N2111, N2115 For Research Use Only. Not for Use in Diagnostic Procedures. N2511, N2515, N2611, N2615 For Laboratory Use.

For additional information see page 122.

Microsatellite Instability (MSI) Analysis

Product	Size	Cat.#
MSI Analysis System, Version 1.2	100 reactions	MD1641
Available Separately		
Internal Lane Standard 600	150 µl	DG1071

DG1071 For Laboratory Use. MD1641 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The MSI Analysis System, Version 1.2, is a fluorescent multiplex PCR-based method detect microsatellite instability (MSI), a form of genomic instability. This instability is due to insertion or deletion of repeating units during DNA replication and failure of the mismatch repair system (MMR) to correct these errors. MSI analysis typically involves comparing allelic profiles of microsatellite markers generated by amplification from matching pairs of test samples, which may be MMR-deficient, and normal tissue samples. New alleles in the abnormal sample not found in the corresponding normal sample indicate the presence of MSI. MSI analysis can be used as a screening method to identify samples for further characterization.

The MSI Analysis System, Version 1.2, includes fluorescently labeled primers (marker panel) for co-amplification of seven markers for analysis of the MSI-high (MSI-H) phenotype, including five nearly monomorphic mononucleotide repeat markers (BAT-25, BAT-26, MONO-27, NR-21 and NR-24) and two highly polymorphic pentanucleotide repeat markers (Penta C and Penta D). Amplified fragments are detected using an ABI PRISM® 310, 3100, 3100-*Avant*, 3130 or 3130*xl* Genetic Analyzer after spectral calibration.

Panels and bins text files simplify and standardize data analysis by providing automated assignment of genotypes using GeneMapper® 4.0 software.

Features:

- **Understand the Complete MSI Phenotype:** A single multiplex PCR amplifies five informative mononucleotide repeat markers for MSI-H determination.
- **Confidence in Sample Identification:** Co-amplification of highly polymorphic pentanucleotide repeats provides internal sample tracking.
- **Consistent Data Analysis:** MSI Panels and bins for GeneMapper® software can be downloaded.

Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system

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Y Chromosome Deletion Detection System, Version 2.0

Product	Size	Cat.#
Y Chromosome Deletion Detection System, Version 2.0	25 reactions	MD1531
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The Y Chromosome Deletion Detection System, Version 2.0, provides a standardized screening panel amplifying only informative nonpolymorphic sequence tag sites (STS) on the human Y chromosome. The system amplifies key functional regions associated with AZoospermia Factor (AZF), namely the regions that flank AZFa and cover AZFb, AZFc, AZFd including *DAZ, KAL-Y, SMCY* and flanking loci for other key spermatogenesis-related genes (namely *RBM1, DFFRY* and *DBY*).

Five Multiplex Master Mixes, with a total of 20 characterized Y-specific primer pairs, are included. Four of the multiplex primer sets contain a control primer pair that amplifies a fragment of the X-linked *SMCX* locus. One of the multiplex primer sets (Multiplex E Master Mix) contains a control primer pair that amplifies a unique region in both male and female DNA (ZFX/ZFY). Finally, a primer pair that amplifies a region of the SRY gene has been included in Multiplex E Master Mix as a control for the testis-determining factor on the short arm of the Y chromosome to detect XX males arising from Y to X translocations.

The Multiplex Master Mixes are designed to facilitate the simultaneous amplification of several different regions of the Y chromosome. The amplification products (83–496bp) of the five multiplex PCR amplifications can be clearly separated by agarose gel electrophoresis and visualized by ethidium bromide staining.

Failure to amplify specific regions of the Y chromosome is indicative of Y chromosome deletions in the test sample. The size control ladder provided minimizes analysis time and the possibility of misinterpreting molecular weight of amplification products.

Features:

- **Ease of Use:** Premixed Multiplex Master Mixes contain 20 primer pairs, including internal controls providing a standardized panel of results requiring no user optimization.
- **More Robust Reactions:** Improved formulation and use of GoTaq® DNA Polymerase minimizes dropouts.
- **Flexibility:** Amplify genomic DNA purified using various methods and with a PE480 (oil overlay) or PE9600/9700 (non-oil overlay) thermal cycler.
- **Complete System:** All required reagents are provided in the kit.

Storage Conditions: Store at –20°C.

Primer Sets in the Y Chromosome Deletion Detection System.

Multiplex	Locus/ STS 1	Locus/ STS 2	Locus/ STS 3	Locus/ STS 4	Locus/ STS 5
Master Mix A	*DAZ*/ SY254	DYS240/ SY157	DYS271/ SY81	DYS221/ SY130	*KAL-Y*/ SY182
Master Mix B	*SMCY*/ SYPR3	DYS218/ SY127	*DAZ*/ SY242		*DAZ*/ SY208
Master Mix C	DYS219/ SY128	DYS212/ SY121	DYF51S1/ SY145	*DAZ*/ SY255	
Master Mix D	DYS236/ SY152	DYS223/ SY133		DYS215/ SY124	
Master Mix E	SRY/ SY14	DYS224/ SY134	DYS148/ SY86	DYS273/ SY84	ZFX1/ ZFY

9492LA

CE-Marked In Vitro Diagnostic Medical Device—Y Chromosome AZF Analysis

Product	Size	Cat.#
Y Chromosome AZF Analysis System	25 reactions	MD1631
For In Vitro Diagnostic Use. This product is only available in certain countries.		

Description: The Y Chromosome AZF Analysis System complies with EU Directive 98/79/EC on in vitro diagnostic medical devices. The Y Chromosome AZF Analysis System provides a multiplex PCR-based method to analyze the integrity of the human Y chromosome AZF region. The Y Chromosome AZF Analysis System is to be used as part of a diagnostic workup to characterize male infertility. This information is potentially useful for patients considering in vitro fertilization because deletions in the AZF region of the Y chromosome are passed on to male offspring produced by in vitro fertilization, resulting in infertility.

The Y Chromosome AZF Analysis System consists of 20 primer pairs that are homologous to previously identified and mapped sequence-tagged sites (STS). These primers will amplify nonpolymorphic short DNA segments from the AZF region of the Y chromosome, covering AZFa, AZFb, AZFc, proximal AZFc/AZFd (including DAZ, KALY and SMCY) and flanking loci for other key spermatogenesis-related genes (RBM1, DFFRY and DBY). The Y Chromosome AZF Analysis System is fully compliant with European Molecular Genetics Quality Network (EMQN) recommendations.

The primers have been combined into five Multiplex Master Mix sets (A–E) for use in multiplex PCR. This makes it possible to analyze all 20 STS by performing five concurrent PCR amplifications.

Features:

- **Compliant with EU Directive 98/79/EC:** Y Chromosome AZF Analysis System is labeled as an in vitro diagnostic medical device and bears the CE Mark.
- **State-of-the-Art Detection of First Choice STS:** Primer pairs are compliant with current EMQN recommendations and include primer pairs to amplify SRY.
- **Single Amplification:** Saves time and labor with simultaneous amplification of 5 multiplex reactions, which analyzes the extent of Y chromosome integrity.
- **Complete System:** Optimized premixed Multiplex Master Mixes, including control primers to test for PCR amplification, provide a standardized panel of results.

Storage Conditions: Store all components at –20°C. Avoid multiple freeze-thaw cycles.

Mass Spectrometry

Products tagged with the Helix® icon are available for distribution through our convenient on-site stocking program in a freezer, refrigerated unit or an ambient cabinet.

For more information visit: **www.promega.com/helix**

Glycosidases

Glycosidases

Product	Size	Conc.	Cat.#
Endo H	10,000 units	500 u/µl	V4871
	50,000 units	500 u/µl	V4875
Fetuin	500 µg	10 mg/ml	V4961
PNGase F	500 units	10 u/µl	V4831

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Endoglycosidase H (Endo H) is a recombinant glycosidase cloned from *Streptomyces plicatus* and overexpressed in *E. coli*. Endo H cleaves the chitobiose core of high mannose and a limited number of hybrid oligosaccharides from N-linked glycoproteins. It does not cleave complex glycans. Enzymatic cleavage is between the two N-acetylglucosamine residues in the diacetylchitobiose core of the oligosaccharide, leaving one N-acetylglucosamine residue on the asparagine. This is in contrast to PNGase F, which cleaves all asparagine-linked oligosaccharides.

Unit Definition: One unit is defined as the amount of enzyme required to remove >95% of the carbohydrate from 10µg of denatured RNase B in 1 hour at 37°C in a total reaction volume of 10µl.

Fetuin is a glycoprotein with O-linked and N-linked glycosylation sites.

PNGase F is a recombinant glycosidase cloned from *Elizabethkingia miricola* and overexpressed in *E. coli*. PNGase F has a molecular weight of 36kDa.

Storage Conditions: Store Endo H and Fetuin at –30 to –10°C.

PNGase F

Product	Size	Conc.	Cat.#
PNGase F	500 units	10 u/µl	V4831

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: PNGase F is a recombinant glycosidase cloned from *Elizabethkingia miricola* and overexpressed in *E. coli*. PNGase F has a molecular weight of 36kDa. PNGase F catalyzes the cleavage of N-linked oligosaccharides between the innermost GlcNAc and asparagine residues of high mannose, hybrid and complex oligosaccharides from N-linked glycoproteins. PNGase F will not remove oligosaccharides containing Alpha-(1,3)-linked core fucose commonly found on plant glycoproteins.

Unit Definition: One unit of PNGase F will catalyze the deglycosylation of 1 nanomole of denatured Ribonuclease B (RNase B) in one minute at 37°C. One Promega unit is equal to 1 IUB milliunit.

Molecular Weight: PNGase F has a molecular weight of approximately 36kDa.

Physical Form: PNGase F is supplied as a liquid in 20mM Tris-HCl (pH 7.5 at 25°C), 50mM NaCl and 5mM EDTA at a concentration of 10,000u/ml.

Storage Conditions: Store at 2–10°C.

Reference Reagents for Mass Spectrometry

6 × 5 LC-MS/MS Peptide Reference Mix

Product	Size	Cat.#
6 × 5 LC-MS/MS Peptide Reference Mix	50 µl	V7491
	200 pmol	V7495

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The 6 × 5 LC-MS/MS Peptide Reference Mix is a unique reagent designed to monitor liquid chromatography (LC) and mass spectrometry (MS) instrument performance and assist in method development and optimization. The product is a mixture of 30 peptides; 6 sets of 5 isotopologues of the same peptide sequence. The isotopologues differ only by the number of stable, heavy-labeled amino acids incorporated into the sequence. The labels consist of uniform ^{13}C and ^{15}N atoms. Chromatographically, each of the isotopologues is indistinguishable; however, since they differ in mass, they are clearly resolved by mass spectrometry. The isotopologues of each peptide are present in a series of tenfold dilutions. This format allows assessment of instrument dynamic range and sensitivity from a single run.

Peptides with a wide range of hydrophobicities were chosen to enable reporting of LC column performance. In addition, the peptides were chosen for maximal stability. Amino acids prone to artificial post-translational modification (i.e., methionine, asparagine, etc.) were excluded from the sequences. None of the peptides have internal lysines or arginines and will therefore not be affected by trypsin or Lys-C. In addition there is a mass separation of at least 4 Daltons between the isotopologues, so that even low-resolution instruments can distinguish the masses.

PReMiS™ Software Tool

The 6 x 5 LC-MS/MS Peptide Reference Mix is accompanied by a complementary PReMiS™ Software tool (available by download) that reports on key liquid chromatography and mass spec parameters. The parameter reports can be exported to CSV or saved as .pdf files.

In addition to the general reporting feature, performance parameters can be tracked over time, allowing a clear assessment of trends to pinpoint poor performance and maintenance needs. For those laboratories that have multiple instruments, the ability to compare parameters across instruments will also be available. Thermo (.raw) and ABSCIEX (.wiff) formats are available for direct importing. Other vendor formats can be imported after conversion to .mzml format. Data reports are rapidly generated (usually in less than 2 minutes), with clear presentation of the XIC of all 30 masses available for immediate viewing.

Features:

- **Save Time:** Unique peptide formulation allows assessment of LC and MS parameters in one run with a single reagent.
- **Eliminate Manual Calculations:** Complementary software provides routine analysis.
- **Ensure Consistent Instrument Performance Over Time:** Complementary software provides historical monitoring.
- **Accurately Report Instrument Sensitivity and Dynamic Range:** Peptides are AAA-qualified.
- **Use with Neat or Complex Mixture Analysis:** Compatible with multiple applications.

Storage Conditions: Store at –30°C to –10°C.

Mass Spec-Compatible Yeast and Human Protein Extracts

Product	Size	Conc.	Cat.#
MS Compatible Yeast Protein Extract, Digest	100 µg		V7461
MS Compatible Human Protein Extract, Digest	100 µg		V6951
MS Compatible Yeast Protein Extract, Intact	1 mg	10 mg/ml	V7341
MS Compatible Human Protein Extract, Intact	1 mg	10 mg/ml	V6941

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The mass spectrometry-compatible yeast and human protein extracts are designed specifically for mass spectrometry applications (i.e., instrument monitoring). The extracts are predigested and cleaned up by solid-phase extraction for immediate use in liquid chromatography/mass spectrometry (LC/MS) analysis. Both the yeast and human extracts also are available in an intact undigested form to provide a test material for optimizing mass spec protein sample preparation. The yeast extracts are beneficial for users who prefer working with a relatively compact and well studied proteome, whereas the human extract provides opportunity for working with a complex proteome having a large dynamic range. Consistent extract protein composition is ensured by tight control over cell culture conditions and manufacturing process.

Lot-to-lot consistency of extracts is monitored by various protein and peptide qualitative and quantitation methods, including LC/MS and amino acid analysis. Our manufacturing process assures compatibility with reverse phase liquid chromatography and mass spectrometry by monitoring nonspecific protein fragmentation, nonbiological post-translational modifications and, for digested extracts, minimal undigested peptides.

Features:

- Compatible with LC/MS instrumentation platforms.
- Minimal nonbiological post-translational modifications.
- Peptide quantity measured by AAA.
- Model systems for method development/instrument monitoring.
- Multiple formats (digest/intact).

Storage Conditions: Store the predigested extracts at –30°C to –10°C. Store the intact, undigested extracts at less than –65°C.

Available in the Helix® on-site stocking system

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Proteases and Surfactants

rAsp-N, Mass Spec Grade

Product	Size	Cat.#
rAsp-N, Mass Spec Grade	10µg	VA1160
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: rAsp-N, Mass Spec Grade, is a recombinant protease that was cloned from *Stenotrophomonas maltophilia* and purified from *E. coli.* rAsp-N is a highly active protease suitable for proteomic analysis of complex mixtures as well as peptide mapping of purified proteins, such as therapeutic monoclonal antibodies. The protease is provided in 10µg aliquots in a conical vial for easy and consistent resuspension.

Features:

- Less expensive alternative to native Asp-N
- Larger volume (5X more protease) for more consistent resuspension
- Use in complex proteomic analyses and peptide mapping of purified proteins

Storage Conditions: Store the lyophilized product at –30°C to –10°C.

Lys-C, Mass Spec Grade, and Lys-N, Mass Spec Grade

Product	Size	Cat.#
Lys-C, Mass Spec Grade	20µg	VA1170
Lys-N, Mass Spec Grade	20µg	VA1180
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Endoproteinase Lys-C, Mass Spec Grade, is a highly-purified serine protease that hydrolyzes specifically at the carboxyl side of lysines. Lys-C retains proteolytic activity under strong protein denaturing conditions such as 8M urea, which can be used to improve digestion of proteolytically resistant proteins. Lys-C, Mass Spec Grade, has optimal activity in the range of pH 7.0–9.0. This protease can be used alone or in combination with other proteases to produce protein digests for peptide mapping applications or protein identification by peptide mass fingerprinting or MS/MS spectral matching.

Endoproteinase Lys-N, Mass Spec Grade, is a zinc metalloprotease that cleaves at the amino side of lysines. Lys-N, Mass Spec Grade, retains proteolytic activity under strong protein denaturing conditions such as 8M urea, which can be used to improve digestion of proteolytically resistant proteins. Charged amino-terminal peptide fragments generated by Lys-N, Mass Spec Grade, are useful for de novo sequencing with ETD fragmentation techniques.

Features:

- Active under strong denaturing conditions
- Choice of N-terminal (Lys-N) or C-terminal (Lys-C) lysine cleavage
- Generates longer peptides than with tryptic digests

Storage Conditions: Store the lyophilized product at –30°C to –10°C.

Rapid Digestion–Trypsin and Rapid Digestion–Trypsin/Lys-C Kits

Product	Size	Cat.#
Rapid Digestion–Trypsin	100µg	VA1060
Rapid Digestion–Trypsin/Lys-C	100µg	VA1061
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The Rapid Digestion–Trypsin and Rapid Digestion–Trypsin/Lys-C Kits are designed to shorten protein digestion times to 60 minutes versus the typical 4–18 hours required for protein digestion. Both kits contain three components: i) protease (Trypsin or Trypsin/Lys-C Mix); ii) protease Resuspension Buffer; and iii) Rapid Digestion Buffer optimized for faster digestions.

Protein digestion with these kits follows a simple-to-use protocol that is both fast and efficient. The protocol is flexible, can accommodate a large range of sample volumes and protein concentrations and requires no special laboratory equipment or off-line desalting. The entire sample preparation procedure is performed in as little as 60 minutes.

Features:

- Faster digestion time.
- Streamlined workflow.
- Tighter coefficients of variation.

Storage Conditions: Store at –30°C to –10°C.

AccuMAP™ Low pH Protein Digestion Kit

Product	Size	Cat.#
AccuMAP™ Low pH Protein Digestion Mini Kit	1 each	VA1040
AccuMAP™ Low pH Protein Digestion Maxi Kit	1 each	VA1050
Available Separately		
AccuMAP™ Denaturing Solution	1ml	VA1000
AccuMAP™ 10X Low pH Reaction Buffer	1ml	VA1010
AccuMAP™ 100X Oxidation Suppressant	50µl	VA1020
AccuMAP™ Low pH Resistant rLys-C Solution	120µl	VA1030
TCEP	15mg	VB1000
Iodoacetamide	15mg	VB1010
AccuMAP™ Modified Trypsin Solution	120µl	V5285
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The AccuMap™ Low pH Protein Digestion Kit is designed for accurate, reproducible characterization of biotherapeutic proteins by peptide mapping using LC/MS or UV HPLC. The entire sample preparation procedure is performed at low (mildly acidic) pH to suppress artificial deamidation and disulfide bond scrambling. The kit also contains an optional agent for suppression of protein oxidation during sample preparation.

Features:

- Complete sample preparation in 4.5–5 hours.
- Highly reproducible digestion results.
- For reduced and nonreduced proteins.

Storage Conditions: Store at less than –65°C.

Sequencing Grade Modified Trypsin

Product	Size	Cat.#
Sequencing Grade Modified Trypsin	100 µg	V5111
	100 µg	V5117

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Trypsin is a serine protease that specifically cleaves at the carboxylic side of lysine and arginine residues. The stringent specificity of trypsin is essential for protein identification. Native trypsin is subject to autolysis, generating pseudotrypsin, which exhibits a broadened specificity including a chymotrypsin-like activity. Such autolysis products, present in a trypsin preparation, would result in additional peptide fragments that could interfere with database analysis of the mass of fragments detected by mass spectrometry. Sequencing Grade Trypsin has been manufactured to provide maximum specificity. Lysine residues in the porcine trypsin have been modified by reductive methylation, yielding a highly active and stable molecule that is extremely resistant to autolytic digestion.

The specificity of the purified trypsin is further improved by TPCK treatment, which inactivates chymotrypsin. The treated trypsin is then purified by affinity chromatography and lyophilized. It is resistant to mild denaturing conditions such as 0.1% SDS, 1M urea or 10% acetonitrile and retains 50% of its activity in 2M guanidine HCl. The activity of trypsin is decreased when acidic residues are present on either side of a susceptible bond. If proline is at the carboxylic side of lysine or arginine, the bond is almost completely resistant to cleavage.

Choose Your Configuration: Learn more about our custom options for this product at: **www.promega.com/custom/**

Recommended Reaction Buffer: 50mM NH_4HCO_3 (pH 7.8).

Features:

- **TPCK Treatment Followed by Affinity Purification:** Elimination of chymotrypsin activity enables distinct and consistent data.
- **Stability:** Ensured up to five freeze-thaw cycles.
- **Reliable and Customer-Proven:** Referenced in thousands of papers.
- **Alternative Formats:** Flexibility depending on experimental design and scope.

Storage Conditions: Store lyophilized at –20°C.

Sequencing Grade Modified Trypsin, Frozen

Product	Size	Cat.#
Sequencing Grade Modified Trypsin, Frozen	100 µg	V5113

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Trypsin is a serine protease that specifically cleaves at the carboxylic side of lysine and arginine residues. The stringent specificity of trypsin is essential for protein identification. Native trypsin is subject to autolysis, generating pseudotrypsin, which exhibits a broadened specificity including a chymotrypsin-like activity. Such autolysis products, present in a trypsin preparation, would result in additional peptide fragments that could interfere with database analysis of the mass of fragments detected by mass spectrometry. Sequencing Grade Trypsin has been manufactured to provide maximum specificity. Lysine residues in the porcine trypsin have been modified by reductive methylation, yielding a highly active and stable molecule that is extremely resistant to autolytic digestion.

The specificity of the purified trypsin is further improved by TPCK treatment, which inactivates chymotrypsin. The treated trypsin is then purified by affinity chromatography. It is resistant to mild denaturing conditions such as 0.1% SDS, 1M urea or 10% acetonitrile and retains 50% of its activity in 2M guanidine HCl. The activity of trypsin is decreased when acidic residues are present on either side of a susceptible bond. If proline is at the carboxylic side of lysine or arginine, the bond is almost completely resistant to cleavage.

Sequencing Grade Modified Trypsin, Frozen, is supplied in convenient 20µg aliquots as a frozen liquid in 50mM acetic acid.

Recommended Reaction Buffer: 50mM NH_4HCO_3 (pH 7.8).

Features:

- **TPCK Treatment Followed by Affinity Purification:** Elimination of chymotrypsin activity enables distinct and consistent data.
- **Stability:** Ensured up to five freeze-thaw cycles.
- **Reliable and Customer-Proven:** Referenced in thousands of papers.

Storage Conditions: Store at –70°C.

Available in the Helix® on-site stocking system

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Trypsin/Lys-C Mix, Mass Spec Grade

Product	Size	Cat.#
Trypsin/Lys-C Mix, Mass Spec Grade	20 µg	V5071
	100 µg	V5072
	100 µg	V5073

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Trypsin/Lys-C Mix, Mass Spec Grade, is a mixture of Trypsin Gold, Mass Spectrometry Grade, and rLys-C, Mass Spec Grade. The Trypsin/Lys-C Mix is designed to improve digestion of proteins or protein mixtures in solution.

Using the conventional trypsin digestion protocol (i.e., overnight incubation at nondenaturing conditions), Trypsin/Lys-C Mix improves protein digestion by eliminating the majority of missed cleavages, which occur at prominent quantities in trypsin digests. Trypsin/Lys-C Mix enhances digestion and compensates for the trypsin proteolytic inefficiency at lysine sites.

Replacing trypsin with Trypsin/Lys-C Mix in this conventional protocol leads to multiple benefits for protein analysis including more accurate mass spectrometry-based protein quantitation and improved protein mass spectrometry analytical reproducibility. Trypsin/Lys-C Mix also provides greater tolerance to trypsin-inhibiting agents, assuring efficient digestion of proteins for which protein purification is limited or not feasible.

Features:

- **Simple to Use:** Use standard overnight digestion with nondenaturing conditions.
- **Enhanced Proteolysis:** Increase peptide recovery, resulting in enhanced protein quantitation and improved reproducibility and eliminating the majority of missed cleavages.
- **Tolerant to Trypsin-Inhibiting Contaminants:** Generate mass spectrometry data from poor-quality sample material.

Storage Conditions: Store Trypsin/Lys-C Mix, Mass Spec Grade, at –30°C to –10°C.

Chymotrypsin, Sequencing Grade

Product	Size	Cat.#
Chymotrypsin, Sequencing Grade	25 µg	V1061
	100 µg	V1062

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Chymotrypsin is a highly-purified serine endopeptidase derived from bovine pancreas that preferentially hydrolyzes at the carboxyl side of aromatic amino acids: Tyr, Phe and Trp. Cleavage may also be observed, but at a lower rate, at Leu and Met. Chymotrypsin activity is optimal in the pH range of 7.0–9.0. This sequencing grade enzyme can be used alone or in combination with other proteases to produce protein digests for peptide mapping applications or protein identification by peptide mass fingerprinting or MS/MS spectral matching. It is suitable for digestion reactions in-solution or in-gel.

Storage Conditions: Store at 4°C.

rLys-C, Mass Spec Grade

Product	Size	Cat.#
rLys-C, Mass Spec Grade	15 µg	V1671

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: rLys-C, Mass Spec Grade, is a recombinant Lys-C expressed in *E. coli*. Sequence origin of rLys-C is Protease IV from *Pseudomonas aeruginosa*. Similar to a native Lys-C, rLys-C cleaves at the carboxyl side of lysine residues with exceptional specificity. rLys-C retains proteolytic activity under protein denaturing conditions such as 8M urea, which is used to improve digestion of proteolytically resistant proteins. rLys-C activity is optimal in the pH range of 8–9. The protease is supplied in a lyophilized form along with a Reconstitution Buffer, which is formulated to increase stability of rLys-C solution. Frozen rLys-C solution can be stored for a month at –20°C without detectable loss of activity. rLys-C is recommended for digestion of single proteins and complex protein mixtures in-solution and in-gel.

Features:

- **Competitive Performance:** Matches cleavage specificity of a native Lys-C. Proteolytic activity is similar.
- **Purity:** No contaminating peptides are identified with reverse-phase HPLC.
- **Application-Qualified:** Each lot is qualified by mass spectrometry.
- **Tolerance to Protein Denaturing Conditions:** Retains activity in 8M urea.
- **Cost-Effective:** Severalfold price reduction as compared to a native Lys-C.

Storage Conditions: Store at –20°C.

Arg-C, Sequencing Grade

Product	Size	Cat.#
Arg-C, Sequencing Grade	10 µg	V1881

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Arg-C (clostripain) is an endopeptidase that cleaves at the C terminus of arginine residues, including the sites next to proline. Cleavage also will occur at lysine residues. This sequencing grade enzyme can be used alone or in combination with other proteases for protein analysis by mass spectrometry and other applications. Arg-C activity is optimal in the pH range of 7.6–7.9.

Storage Conditions: Store at 2–10°C.

Asp-N, Sequencing Grade

Product	Size	Cat.#
Asp-N, Sequencing Grade	2 µg	V1621

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Asp-N, Sequencing Grade, is an endoproteinase that hydrolyzes peptide bonds on the N-terminal side of aspartic and cysteic acid residues: Asp and Cys. Asp-N activity is optimal in the pH range of 4.0–9.0. This sequencing grade enzyme can be used alone or in combination with other proteases to produce protein digests for peptide mapping applications or protein identification by peptide mass fingerprinting or MS/MS spectral matching. It is suitable for digestion reactions in solution or in gel.

Storage Conditions: Store at 4°C.

Glu-C, Sequencing Grade

Product	Size	Cat.#
Glu-C, Sequencing Grade	50 µg	V1651

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Glu-C, Sequencing Grade (*S. aureus* V8), is a serine protease that specifically cleaves at the C terminus of either aspartic or glutamic acid residues. In ammonium bicarbonate and ammonium acetate the enzyme specificity is higher at the glutamic residues. In phosphate buffers cleavage occurs at the aspartic and glutamic residues. Glu-C activity is optimal in the pH range of 4.0–9.0. This sequencing grade enzyme can be used alone or in combination with other proteases to produce protein digests for peptide mapping applications or protein identification by peptide mass fingerprinting or MS/MS spectral matching. It is suitable for digestion reactions in solution but not recommended for in-gel digestions.

Storage Conditions: Store at 2–10°C.

Elastase

Product	Size	Cat.#
Elastase	5 mg	V1891

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Elastase is a serine protease that preferentially cleaves at the C terminus of alanine, valine, serine, glycine, leucine or isoleucine. Elastase has a unique capability of digesting elastin. This enzyme can be used alone or in combination with other proteases for protein analysis by mass spectrometry and other applications. Elastase activity is optimal at pH 9.0.

Storage Conditions: Store at 2–10°C.

Pepsin

Product	Size	Cat.#
Pepsin	250 mg	V1959

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Pepsin preferentially cleaves at the C terminus of phenylalanine, leucine, tyrosine and tryptophan. This protease can be used alone or in combination with other proteases for protein analysis by mass spectrometry and other applications. Pepsin activity is optimal at pH 1.0–3.0.

Storage Conditions: Store at 2–10°C.

Thermolysin

Product	Size	Cat.#
Thermolysin	25 mg	V4001

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Thermolysin is a thermostable metalloproteinase. The high digestion temperatures may be used as an alternative to denaturants to improve digestion of proteolytically resistant proteins. Thermolysin preferentially cleaves at the N terminus of the hydrophobic residues leucine, phenylalanine, valine, isoleucine, alanine and methionine. The optimal digestion temperature range is 65–85°C. Thermolysin activity is optimal at pH 5.0–8.5.

Storage Conditions: Store at –30 to –10°C.

Immobilized Trypsin

Product	Size	Cat.#
Immobilized Trypsin	2 ml	V9012
	4 ml	V9013

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Immobilized Trypsin provides a fast and convenient method for digesting a range of concentrations of purified protein or complex protein mixtures. Digested peptides are easily separated from the Immobilized Trypsin as they flow through the spin column into the collection tube. Immobilized Trypsin is easily removed from the peptide solution because the trypsin does not pass though the column frit. Trypsin is a proteolytic enzyme, which cleaves at the carboxyl side of positively charged Lysine (Lys) and Arginine (Arg). When these amino acids are followed by the nonpolar Proline (Pro), the digestion of the site is not efficient. When Lys and Arg are followed by acids [Aspartic Acid (Asp) and Glutamic Acid (Glu)] the digestion is also not as efficient.

Features:

- **Fast:** Digestions can be accomplished in as little as 30 minutes.
- **Scalable:** Easily adjustable protocol to accommodate various protein concentrations.
- **Easy to Use:** No shaking or water baths necessary.

Storage Conditions: Store at 4°C.

Available in the Helix® on-site stocking system

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Trypsin Gold, Mass Spectrometry Grade

Product	Size	Cat.#
Trypsin Gold, Mass Spectrometry Grade	100 µg	V5280

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Trypsin is a serine protease that specifically cleaves at the carboxylic side of lysine and arginine residues. The stringent specificity of trypsin is essential for protein identification. Native trypsin is subject to autolysis, generating pseudotrypsin, which exhibits a broadened specificity including a chymotrypsin-like activity. Such autolysis products, present in a trypsin preparation, would result in additional peptide fragments that could interfere with database analysis of the mass of fragments detected by mass spectrometry. Trypsin Gold, Mass Spectrometry Grade, is manufactured to provide maximum specificity. Lysine residues in the porcine trypsin have been modified by reductive methylation, yielding a highly active and stable molecule that is extremely resistant to autolytic digestion. The specificity of the purified trypsin is further improved by TPCK treatment, which inactivates chymotrypsin. The treated trypsin is then purified by affinity chromatography and lyophilized to yield Trypsin Gold, Mass Spectrometry Grade. It is resistant to mild denaturing conditions such as 0.1% SDS, 1M urea or 10% acetonitrile and retains 50% of its activity in 2M guanidine HCl. The activity of trypsin is decreased when acidic residues are present on either side of a susceptible bond. If proline is at the carboxylic side of lysine or arginine, the bond is almost completely resistant to cleavage.

Each lot of quality-tested Trypsin Gold, Mass Spectrometry Grade, is qualified for use with in-gel digestion and mass spectrometric analysis.

Learn more about our custom options for this product at:
www.promega.com/custom/

Features:

- **Each Lot Qualified by Mass Spectrometry:** Ensures compatibility with customer applications/instrumentation.
- **TPCK Treatment Followed by Affinity Purification:** Elimination of chymotrypsin activity enables distinct and consistent data.
- **Stability Ensured up to Five Freeze-Thaw Cycles:** Minimize leftover reagents.
- **Referenced in Thousands of Papers:** Reliable and customer proven.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store the lyophilized powder at –20°C. Reconstitute powder in 50mM acetic acid and store at –20°C. For long-term storage, freeze reconstituted trypsin at –70°C. Limit the number of freeze-thaw cycles to five.

Glycosidases

Product	Size	Conc.	Cat.#
Endo H	10,000 units	500 u/µl	V4871
	50,000 units	500 u/µl	V4875
Fetuin	500 µg	10 mg/ml	V4961
PNGase F	500 units	10 u/µl	V4831

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Endoglycosidase H (Endo H) is a recombinant glycosidase cloned from *Streptomyces plicatus* and overexpressed in *E. coli*. Endo H cleaves the chitobiose core of high mannose and a limited number of hybrid oligosaccharides from N-linked glycoproteins. It does not cleave complex glycans. Enzymatic cleavage is between the two N-acetylglucosamine residues in the diacetylchitobiose core of the oligosaccharide, leaving one N-acetylglucosamine residue on the asparagine. This is in contrast to PNGase F, which cleaves all asparagine-linked oligosaccharides.

Unit Definition: One unit is defined as the amount of enzyme required to remove >95% of the carbohydrate from 10µg of denatured RNase B in 1 hour at 37°C in a total reaction volume of 10µl.

Fetuin is a glycoprotein with O-linked and N-linked glycosylation sites.

PNGase F is a recombinant glycosidase cloned from *Elizabethkingia miricola* and overexpressed in *E. coli*. PNGase F has a molecular weight of 36kDa.

Storage Conditions: Store Endo H and Fetuin at –30 to –10°C.

ProTEV Plus

Product	Size	Conc.	Cat.#
ProTEV Plus	1,000 u	5 u/µl	V6101
	8,000 u	5 u/µl	V6102

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: ProTEV Plus is an improved 48kDa version of the Nla protease from tobacco etch virus (TEV) that has been engineered to be more stable than native TEV protease for prolonged enzymatic activity. It is a highly specific proteolytic enzyme that cleaves within a seven-amino-acid sequence (ENLYFQ(G/S)). ProTEV Plus is active over a wide range of pH values (5.5–8.5) and temperatures (4–30°C). It can be used to cleave protein fusions that have been engineered with the above amino acid sequence at the desired cleavage site. The enzyme is compatible for both in-solution and on-column cleavage reactions. ProTEV Plus also contains an HQ tag (analogous to His tag) located at the N terminus of the protein, which allows it to be immobilized on Ni-based affinity resins and removed from the cleavage reaction.

Learn more about our custom options for this product at:
www.promega.com/custom/

Features:

- **Active Over a Wide Range of pH and Temperatures:** Cleave individual fusion proteins using optimal conditions to maintain activity and correct conformation.
- **HQ-Tagged:** Convenient removal of ProTEV Plus using Ni-based affinity resins after cleavage.
- **Specific:** Highly specific and active for its seven-amino acid sequence with minimal off-target effects.
- **Cleaves Fusion Proteins Directly in Solution or Immobilized on Affinity Resins:** ProTEV Plus is easy to use in multiple experimental formats.

Storage Conditions: Store at –20°C.

ProteaseMAX™ Surfactant, Trypsin Enhancer

Product	Size	Cat.#
ProteaseMAX™ Surfactant, Trypsin Enhancer	1 mg	V2071
	5 × 1 mg	V2072

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: ProteaseMAX™ Surfactant, Trypsin Enhancer, is designed to improve in-gel and in-solution protein digestion. ProteaseMAX™ Surfactant ensures fast and efficient protein digestion with proteases such as Trypsin, Chymotrypsin and Lys-C. For in-gel protein digestion, ProteaseMAX™ Surfactant offers time and labor savings. Digestion step is complete in 1 hour, and the surfactant provides concurrent extraction of peptides from gels, eliminating the need for post-digestion peptide extraction. The surfactant also improves recovery of longer peptides that are retained in the gel under a standard extraction protocol.

For in-solution digestions, ProteaseMAX™ Surfactant solubilizes proteins, including difficult proteins (i.e., membrane proteins), and enhances protein digestion by providing a denaturing environment prior to protease addition.

ProteaseMAX™ Surfactant degrades over the course of a digestion reaction, yielding products that are compatible with downstream methods such as mass spectrometry (MS) and liquid chromatography (LC). No long-term negative effect of the residual surfactant on the ion optics and capillary of mass spectrometers has been observed. ProteaseMAX™ Surfactant can be used with existing in-gel or in-solution digestion protocols.

Features:

- **No Peptide Extraction Required Following In-Gel Digestions:** Save time and increase the number of samples processed.
- **Improved Peptide Recovery from Gels:** Increase protein sequence coverage, thus increasing confidence of protein identification.
- **Enhanced Protein Solubilization:** Solubilize complex proteins, such as membrane proteins, at room temperature, avoiding high temperature and preventing precipitation.
- **Degrades Over Course of Digestion:** Samples are ready for use directly for mass spectrometry analysis without additional inactivation steps such as heating or acid treatment.

Storage Conditions: Store lyophilized ProteaseMAX™ Surfactant at –20°C.

Available in the Helix® on-site stocking system

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Proteinase K (Lyophilized)

Product	Size	Cat.#
Proteinase K	100 mg	V3021

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Proteinase K, produced by the fungus *Tritirachium album* Limber, is a serine protease that exhibits broad cleavage activity. It cleaves peptide bonds adjacent to the carboxylic group of aliphatic and aromatic amino acids and is useful for general digestion of protein in biological samples. It has been purified to remove RNase and DNase activities. The stability of Proteinase K in urea and SDS and its ability to digest native proteins make it useful for a variety of applications including preparation of chromosomal DNA for pulsed-field gel electrophoresis, protein fingerprinting and removal of nucleases from preparations of DNA and RNA. A typical working concentration for Proteinase K is 50–100µg/ml.

Form: Lyophilized powder.

Recommended Reaction Buffer: 50mM Tris-HCl (pH 8.0), 10mM $CaCl_2$.

Features:

- **Stable:** Active over a pH range of 4.3–12.0, in 0.5% SDS or 1% Triton® X-100 and retains >80% of its activity at temperatures up to 60°C.

Storage Conditions: Store lyophilized powder desiccated at –20°C.

IdeS Protease and IdeZ Protease

Product	Size	Conc.	Cat.#
IdeS Protease	5,000 units		V7511
IdeS Protease	25,000 units		V7515
IdeZ Protease	5,000 units		V8341
IdeZ Protease, Frozen	2,000 units	50 u/µl	V8342
IdeZ Protease	25,000 units		V8345

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: IdeS Protease

IdeS Protease is an immunoglobulin-degrading enzyme from *Streptococcus pyogenes* (IdeS). It is an engineered recombinant protease overexpressed in *E. coli* that cleaves Immunoglobulin G (IgG) with high specificity at a single site below the hinge region, yielding $F(ab')_2$ and Fc fragments. The protocol for a standard reaction is to add the IdeS Protease to the IgG sample, add 1 unit of IdeS Protease per 1µg of IgG to be digested and incubate the sample at 37°C for 30–60 minutes in a neutral pH buffer.

IdeZ Protease

IdeZ Protease is an immunoglobulin-degrading enzyme from *Streptococcus equi* subspecies *zooepidemicus*. It is an engineered recombinant protease overexpressed in *E. coli*. Like IdeS Protease, IdeZ Protease specifically cleaves IgG molecules below the hinge region to yield $F(ab')_2$ and Fc fragments. However, IdeZ Protease has significantly improved activity against mouse IgG2a and IgG3 subclasses compared to IdeS Protease.

Features:

- **See Digestion in 30 Minutes with No Optimization:** Fast and easy to use.
- **Cleave Exclusively at a Single Site Below the Hinge to Produce $F(ab')_2$ and Fc Fragments:** Highly reproducible and specific.
- **Expect High Performance:** Essentially 100% complete digestion.
- **Effectively Cleave Many IgG Molecules:** Both IdeS and IdeZ Proteases effectively cleave human IgG1, IgG2, IgG3 and IgG4, monkey, sheep, rabbit, humanized and chimeric IgGs as well as Fc-fusion proteins. However, mouse IgG2a and IgG3 are cleaved by IdeZ Protease only.

Storage Conditions: Store IdeS Protease at –30°C to –10°C. Store IdeZ Protease at –30°C to –10°C.

Factor Xa Protease

Product	Size	Cat.#
Factor Xa Protease	50 µg	V5581

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Description: Factor Xa Protease is purified from bovine plasma and activated by treatment with the activating enzyme from Russell's viper venom. Factor Xa Protease preferentially cleaves after the arginine residue in the amino acid sequence Ile-Glu-Gly-Arg.

Recommended Reaction Buffer: 20mM Tris-HCl (pH 7.4), 0.1M NaCl.

Storage Conditions: Store in aliquots at –20°C.

Protein Expression

Products tagged with the Helix® icon are available for distribution through our convenient on-site stocking program in a freezer, refrigerated unit or an ambient cabinet.

For more information visit: **www.promega.com/helix**

Available in the Helix® on-site stocking system

Cell-Based Protein Expression

Regulated Mammalian Expression System

Product	Size	Cat.#
Regulated Mammalian Expression System	1 system	C9470
Coumermycin A1	5 mg	C9451
Novobiocin Sodium Salt	1 g	C9461
Available Separately		
pReg neo Vector	20 µg	C9421
pF12A RM Flexi® Vector	20 µg	C9431
pF12K RM Flexi® Vector	20 µg	C9441

C9421, C9470, C9431, C9451, C9441 For Research Use Only. Not for Use in Diagnostic Procedures. C9461 For Research Use Only. Not for Use in Therapeutic or Diagnostic Procedures.

Description: The Regulated Mammalian Expression System features low basal levels, robust and rapid induction, and downregulation of gene expression in mammalian cells. The Regulated Mammalian Expression System is based on a novel on/off switch that relies on the rapid and sensitive modulation by coumerin-related compounds of a chimeric transactivator protein. Nanomolar concentrations of the antibiotic coumermycin promote homodimerization of a chimeric transactivator that, in turn, binds to lambda operator sequences located upstream of a minimal promoter driving transcription of coding sequences for a protein of interest. The levels of protein expression can be regulated by adjusting the coumermycin concentration. More significantly, this expression can be promptly and effectively switched off by adding novobiocin, which acts as an antagonist by dissociating the dimerized transactivator protein.

The protein coding region of interest is cloned into either the pF12A RM Flexi® Vector or pF12K RM Flexi® Vector, both of which are specially designed for Regulated Mammalian (RM) protein expression. These vectors incorporate regulatory promoter sequences upstream of the protein-coding region and are compatible with the Flexi® Vector System. In transient transfection paradigms, the pF12A or pF12K RM Flexi® Vector containing the protein-coding region of interest is co-transfected into mammalian cells together with the pReg neo Vector. The pReg neo Vector is designed to express a chimeric transactivator protein that interacts with the regulatory promoter region in the pF12A and pF12K RM Flexi® Vectors in a regulated fashion in response to coumermycin and novobiocin. Additionally, the pReg neo Vector encodes a neomycin phosphotransferase gene that allows stable cell selection and generation with the antibiotic G-418.

Features:

- **Enhanced Data:** High level of controlled induction combined with low basal protein expression.
- **Regulated Expression:** Dose-response induction of protein expression; rapid and sensitive on/off switch for protein expression.
- **Versatility:** Compatible with other Flexi® Vectors.

Storage Conditions: Store at –20°C.

Single Step (KRX) Competent Cells

Product	Size	Cat.#
Single Step (KRX) Competent Cells	20 × 50 µl	L3002
L-Rhamnose Monohydrate	10 g	L5701
	50 g	L5702

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Single Step (KRX) Competent Cells are designed for efficient transformation and tightly controlled protein expression. These cells consolidate the best attributes of these two steps into one strain to evaluate protein expression in *E. coli*.

Transformation efficiencies are greater than 10^8 cfu/µg, similar to other highly competent cells. The single step cells are available in single transformation size (50µl). KRX also can be used for blue/white screening.

Single Step (KRX) is an *E. coli* K strain that contains a chromosomal copy of the T7 RNA polymerase driven by a rhamnose promoter (rhaBAD) to provide dramatic control of the proteins expressed via a T7 promoter. Pre-induced expression protein levels are significantly lower than those of BL21(DE3)-derived strains. This feature facilitates cloning and expression of proteins toxic to *E. coli*.

Genotype: [F′, *tra*D36, Δ*ompP*, *pro*A$^+$B$^+$, *lacI*^{q}, Δ(*lacZ*)M15] Δ*ompT*, *end*A1, *rec*A1, *gyr*A96 (Nal^r), *thi*-1, *hsd*R17 (r_k^-, m_k^+), e14$^-$ (McrA$^-$), *rel*A1, *sup*E44, Δ(*lac-pro*AB), Δ(*rha*BAD)::T7 RNA polymerase.

Features:

- **Save Time:** In two days, you can transform your vector into the Single Step (KRX) Competent Cells and be ready for protein expression.
- **Controlled Protein Expression:** For overall expression of cloned proteins, the Single Step (KRX) Competent Cells provide dramatic control of expressed protein-coding regions.
- **Achieve High Yields:** Protein expression levels were shown to be as high as or higher than levels expressed in BL21(DE3)-derived strains.
- **Blue/White Screening:** Convenient method for detecting recombinant clones.

Storage Conditions: Always store competent cells at –70°C. Thaw on ice when ready for use. Do not refreeze thawed, unused aliquots.

BL21(DE3)pLysS Competent Cells

Product	Size	Cat.#
Single-Use BL21(DE3)pLysS Competent Cells	1 ml	L1195
BL21(DE3)pLysS Competent Cells, >10^6cfu/µg	1 ml	L1191

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: BL21(DE3)pLysS Competent Cells allow high-efficiency protein expression of any gene that is under the control of a T7 promoter and has a ribosome binding site. BL21(DE3)pLysS is lysogenic for λ-DE3, which contains the T7 bacteriophage gene I, encoding T7 RNA polymerase under the control of the *lac* UV5 promoter. BL21(DE3)pLysS also contains a plasmid, pLysS, which carries the gene encoding T7 lysozyme. T7 lysozyme lowers the background expression level of target genes under the control of the T7 promoter but does not interfere with the level of expression achieved following induction by IPTG. For researchers doing more than one transformation, competent cells are available in standard format (200µl aliquots). For added convenience, single-use competent cells (50µl aliquots) also are offered.

Genotype: F–, *ompT*, *hsdS*$_B$ (r_B–, m_B–), *dcm*, *gal*, λ(DE3), pLysS, Cm^r.

Features:

- **T7 RNA Polymerase Under the Control of the** *lac* UV5 Promoter: Inducible protein expression.
- **Deficient in Proteases lon and OmpT:** Increased stability of expressed protein.
- **pLysS Plasmid:** Lower background expression of target genes.

Storage Conditions: Store at –70°C.

Eukaryotic Cell-Free Protein Expression

TnT® T7 Insect Cell Extract Protein Expression System

Product	Size	Cat.#
TnT® T7 Insect Cell Extract Protein Expression System	10 reactions	L1101
	40 reactions	L1102
pF25A ICE T7 Flexi® Vector	20 µg	L1061
pF25K ICE T7 Flexi® Vector	20 µg	L1081

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The TnT® T7 Insect Cell Extract Protein Expression System is a convenient, quick, single-tube, coupled transcription/translation system for the cell-free expression of proteins. Protein synthesis reactions are initiated by the addition of a DNA template, eliminating the need for the time-consuming process of in vitro RNA synthesis.

The extract is made from the commonly used *Spodoptera frugiperda* Sf21 cell line. All components necessary for the transcription/translation are present in the TnT® T7 ICE Master Mix. To initiate protein synthesis, the only component that must be added is the DNA template. Reactions are incubated at 28–30°C and are complete within 4 hours.

Proteins are expressed from genes cloned downstream of the T7 promoter. Companion vectors have been designed to achieve optimal yield with this system (pF25A and pF25K). They contain untranslated region (UTR) sequences at the 5′ and 3′ ends of the gene coding region to enhance translation efficiency. Using the TnT® T7 Insect Cell Extract Protein Expression System and these vectors, 75µg/ml of functional protein can be produced.

Features:

- **Obtain Data Faster:** Protein is expressed in only 4 hours, not days as with cell-based expression.
- **Complete System:** No requirement to purchase additional reagents.
- **Achieve High Protein Yields:** Express up to 75µg/ml of protein for multiple applications.

Storage Conditions: Store at –70°C.

TnT® SP6 High-Yield Wheat Germ Protein Expression System

Product	Size	Cat.#
TnT® SP6 High-Yield Wheat Germ Protein Expression System	40 reactions	L3260
	10 reactions	L3261
Available Separately		
TnT® SP6 High-Yield Master Mix Minus Amino Acids	1 ml	X808X

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Description: The TnT® SP6 High-Yield Wheat Germ Protein Expression System, based on an optimized wheat germ extract, is a single-tube, coupled transcription/translation system designed to express proteins in only two hours. Protein synthesized, in the range of 10–100µg/ml, can be used in multiple proteomic-based applications, as well as in high-throughput analysis.

All components necessary for transcription/translation are provided in the extract, with the exception of the plasmid DNA or PCR template. Optional protein-labeling reagents must also be supplied by the user.

For custom wheat germ extract (depleted amino acids), order Cat.# X808X (see Products, Available Separately).

Features:

- **Save Time:** You can generate protein in only two hours, as compared to days when using cell-based (*E. coli*) systems.
- **Choose Your Format:** Use plasmid or PCR-generated templates to generate protein.
- **Achieve High Yields:** Generate 10- to 20-fold more protein (10–100µg/ml) when compared to other cell-free systems.
- **Generate Usable Protein:** Generate soluble, full-length protein and avoid problems associated with *E. coli* systems.

Storage Conditions: Store at –70°C.

Available in the Helix® on-site stocking system

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TnT® Quick Coupled Transcription/Translation System

Product	Size Conc.	Cat.#
TnT® T7 Quick Coupled Transcription/Translation System	40 reactions	L1170
TnT® T7 Quick Coupled Transcription/Translation System, Trial Size	5 reactions	L1171
TnT® SP6 Quick Coupled Transcription/Translation System	40 reactions	L2080
TnT® SP6 Quick Coupled Transcription/Translation System, Trial Size	5 reactions	L2081
Magnesium Acetate	100 µl 25 mM	L4581
Potassium Chloride	200 µl 2.5 M	L4591

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The TnT® Quick Systems are convenient single-tube, coupled transcription/translation reactions for eukaryotic cell-free protein expression. These cell-free expression systems combine the RNA Polymerase, nucleotides, salts, amino acids and Recombinant RNasin® Ribonuclease Inhibitor with the reticulocyte lysate solution to form a single TnT® Quick Master Mix.

The TnT® Quick Coupled Transcription/Translation System is available in two configurations for the expression of genes cloned downstream from either the T7 or SP6 RNA polymerase promoters. To use these cell-free expression systems, 0.2–2.0µg of circular plasmid DNA containing a T7 or SP6 promoter, or a PCR-generated fragment containing a T7 promoter, is added to an aliquot of the TnT® Quick Master Mix and incubated in a 50µl reaction volume for 60–90 minutes at 30°C. The expression reaction produces significant quantities of protein for a variety of applications including GST pull-downs and gel shift assays.

Features:

- **Obtain Data Faster:** Functional protein is expressed in only one hour, not days as with cell-based expression systems.
- **Multiple Applications with One System:** Use expressed protein for the characterization of protein:protein interaction, protein:nucleic acid interaction, protein modification and more.
- **Consistent, Reliable Results:** This mammalian-based system expresses soluble, functional proteins that are post-translationally modified, unlike *E. coli*-based systems.
- **Fewer Steps:** Expressed proteins can be used directly after expression; no requirement for additional purification.
- **Flexible Systems Available:** TnT® Systems for linear, circular or PCR templates are available.

Storage Conditions: Store at –70°C. Do not freeze-thaw the lysate more than two times.

TnT® Coupled Reticulocyte Lysate Systems

Product	Size	Cat.#
TnT® SP6 Coupled Reticulocyte Lysate System	40 reactions	L4600
TnT® SP6 Coupled Reticulocyte Lysate System, Trial Size	8 reactions	L4601
TnT® T7 Coupled Reticulocyte Lysate System	40 reactions	L4610
TnT® T7 Coupled Reticulocyte Lysate System, Trial Size	8 reactions	L4611
TnT® T3 Coupled Reticulocyte Lysate System	40 reactions	L4950
TnT® T7/T3 Coupled Reticulocyte Lysate System	40 reactions	L5010
TnT® T7/SP6 Coupled Reticulocyte Lysate System	40 reactions	L5020

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Description: The TnT® Coupled Reticulocyte Lysate Systems offer researchers an alternative for eukaryotic cell-free protein expression: a single-tube, coupled transcription/translation system. The TnT® Lysate Systems greatly simplify the process and reduce the time required to obtain in vitro translation results. Standard rabbit reticulocyte lysate translations commonly use RNA synthesized in vitro from SP6, T3 or T7 RNA polymerase promoters and require three separate reactions with several steps between each reaction. The TnT® Systems bypass many of these steps by incorporating transcription directly in the translation mix.

For optimal protein expression using the TnT® SP6 RNA polymerase, we recommend titrating magnesium acetate in 0.1mM increments between 0.1mM and 0.5mM. In some instances the addition of 0.2mM magnesium acetate has been shown to increase protein expression by 40%. Magnesium acetate is supplied only with Cat.# L4600 and L4601.

Features:

- **Use in Multiple Applications:** The TnT® Systems are widely used for protein:protein interaction, protein:nucleic acid interactions, and more.
- **Save Time:** Using a one-tube reaction, proteins are generated in one hour, not days, as with in vivo methods.
- **Complete System:** All the reagents you need are provided (except radioisotopes).
- **Reliable:** Eliminate solubility issues by using an in vitro mammalian system.
- **Dependability You Can Count On:** The TnT® Systems are rigorously quality controlled to ensure the highest level of performance.

Storage Conditions: Store the polymerase at –20 to –70°C. Store Luciferase Assay Wells at room temperature. Store the other components at –70°C. Do not freeze-thaw the lysate more than two times.

TnT® Coupled Wheat Germ Extract System

Product	Size	Cat.#
TnT® SP6 Coupled Wheat Germ Extract System	40 reactions	L4130
TnT® T7 Coupled Wheat Germ Extract System	40 reactions	L4140
TnT® T7/SP6 Coupled Wheat Germ Extract System	40 reactions	L5030

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The TnT® Coupled Wheat Germ Extract Systems offer researchers an alternative for eukaryotic cell-free protein expression: a one-tube, coupled transcription/translation system. The TnT® Extract Systems greatly simplify the process and reduce the time required to obtain in vitro translation results. Standard wheat germ extract translations commonly use RNA synthesized in vitro from SP6 or T7 RNA polymerase promoters. This entire process requires separate reactions with several steps between each reaction. The TnT® Extracts bypass many of these steps by incorporating transcription directly in the translation mix. Additionally, the TnT® Extract reactions often produce significantly more protein (two- to sixfold) in a 1.5-hour reaction than do standard in vitro wheat germ extract translations using RNA templates.

Magnesium Acetate, 25mM, and Potassium Chloride, 2.5M, can be used to optimize in vitro translation reactions in the TnT® T7 Quick Coupled Transcription/Translation System, Flexi® Rabbit Reticulocyte Lysate System and TnT® Coupled Wheat Germ Extract System.

Features:

- **Reliable:** The TnT® Systems are rigorously quality controlled to ensure the highest level of transcription/translation, whether your template is a linear (T7 only) or circular plasmid.
- **Convenient:** Single-tube procedure eliminates the time and effort required to prepare RNA for a standard wheat germ translation. Translation results can be visualized by autoradiography in 6–8 hours.
- **Versatile:** The T7 system will produce protein from linear DNA. The SP6 system will produce protein from circular DNA. For PCR templates use TnT® T7 Quick for PCR DNA (Cat.# L5540).
- **Controls Included:** Luciferase Control DNA and Luciferase Assay Reagents are included with the system as functional controls. Only full-length luciferase is active.

Storage Conditions: Store the polymerase at –20°C. Store the Luciferase Assay Wells at room temperature. Store the other components at –70°C. Avoid multiple freeze-thaw cycles.

TnT® Starter Bundle

Product	Size	Cat.#
TnT® T7 Quick Starter Bundle, Chemiluminescent	1 each	L1210
TnT® T7 Quick Starter Bundle, Colorimetric	1 each	L1215

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Description: Get the tools you need in one bundle to start cell-free expression and detection of your proteins of interest. Use the system for in vitro analysis of protein:protein or protein:nucleic acid interactions, or simply verify the ability of your clone to express protein. Purchase this special bundle, and get the popular TnT® T7 Quick Coupled Transcription/Translation System, your choice of Transcend™ Translation Detection System, and receive two cell-free expression-qualified expression vectors, pTnT™ and pCMVTnT™ Vectors, at no extra cost.

Features:

- **TnT® T7 Quick Coupled Transcription/Translation System:** Our most popular cell-free translation system—a simple one-hour, one-tube reaction. Requires only a protein coding sequence downstream of a T7 RNA polymerase promoter to produce protein. Produced protein may be used in a variety of applications including pull-downs, immunoprecipitations and gel shift assays. TnT® T7 Quick Coupled Transcription/Translation System Technical Manual #TM045.
- **Transcend™ Translation Detection Systems:** A simple addition of the Transcend biotin-labeled lysine tRNA to the TnT® T7 Quick reaction provides a simple means of tagging a protein for easy detection. Detect proteins through simple Western blotting techniques with either chemiluminescent or colorimetric techniques. Transcend™ Translation Detection Systems Technical Bulletin #TB182.
- **pTnT™ Vector:** Specifically designed to work with the TnT® Systems with added features to enhance cell-free expression. pTnT™ Vector Technical Bulletin #TB304.
- **pCMVTnT™ Vector:** Specifically designed to work with the TnT® Systems with added features to enhance cell-free expression. Go from cell-free expression to mammalian expression directly with built-in CMV promoter. pCMVTnT™ Vector Technical Bulletin #TB305.

Storage Conditions: Store the TnT® Quick System at –70°C. Do not freeze-thaw the lysate more than two times. Store the Transcend™ tRNA at –70°C. Do not subject the Transcend™ tRNA to more than five freeze-thaw cycles. Store all other Transcend™ System components at 4°C. Store the pTnT™ and pCMVTnT™ Vectors at –20°C.

Available in the Helix® on-site stocking system

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pCMVTNT™ and pTNT™ Vectors

Product	Size	Cat.#
pCMVTNT™ Vector	20 µg	L5620
pTNT™ Vector	20 µg	L5610
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Description: The pCMVTNT™ and pTNT™ Vectors are designed for onvenient expression of cloned genes in vitro or in vivo. SP6 and T7 promoters allow expression from SP6- or T7-based coupled in vitro transcription/translation systems. The presence of RNA phage promoters also allows highly efficient synthesis of RNA in vitro. Both vectors contain a 5′ β-globin leader sequence and synthetic poly(A)30 tail, which have been shown to enhance expression of certain genes.

For in vivo expression, the pCMVTNT™ Vector contains a CMV enhancer/promoter region, which allows strong constitutive expression in many cell types.

Features:

- **Flexible:** Tandem SP6 and T7 phage promoters allow use in the appropriate in vitro translation or transcription system.
- **Convenient:** Multiple cloning site provides a selection of restriction sites.
- **In Vivo Expression:** The CMV enhancer/promoter region in the pCMVTNT™ Vector allows strong constitutive expression in many cell types.

Storage Conditions: Store at –20°C.

TNT® T7 Quick for PCR DNA

Product	Size	Cat.#
TNT® T7 Quick for PCR DNA	40 reactions	L5540
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: TNT® T7 Quick for PCR DNA is a rapid, convenient, coupled transcription/translation system designed for optimum protein expression from PCR templates. For most PCR templates, the TNT® T7 Quick for PCR DNA reactions produce up to 5 times more protein than other commercially available kits. The PCR-generated DNA can be used directly from the amplification reaction or purified by numerous commercially available kits and traditional methods.

Features:

- **Convenient:** Directly from PCR, no cleanup necessary.
- **High Yield:** Up to 5 times more expressed protein than standard translation reactions with linear templates.
- **Quick:** One-tube reaction.
- **Complete:** Reagents including Recombinant RNasin® Ribonuclease Inhibitor are included in the Quick Master Mix.
- **Good Value:** One-tube format means no leftover reagents.
- **Reliable:** The TNT® Systems are rigorously quality controlled to ensure the highest level of transcription/translation.

Storage Conditions: Store at –70°C. Do not freeze-thaw the Master Mix more than two times.

Rabbit Reticulocyte Lysate System, Nuclease Treated

Product	Size	Cat.#
Rabbit Reticulocyte Lysate System, Nuclease Treated	30 reactions	L4960
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Rabbit Reticulocyte Lysate Translation Systems are utilized in the identification of mRNA species, the characterization of their protein products and the investigation of transcriptional and translational control. Rabbit Reticulocyte Lysate is prepared from New Zealand white rabbits using a standard protocol that ensures reliable and consistent reticulocyte production in each lot. After the reticulocytes are lysed, the extract is treated with micrococcal nuclease to destroy endogenous mRNA and thus reduce background translation to a minimum. The lysate contains the cellular components necessary for protein synthesis (tRNA, ribosomes, amino acids, initiation, elongation and termination factors).

Features:

- **Consistent:** Reliable and consistent translation with each lot.
- **Optimized and Ready to Use:** The treated Rabbit Reticulocyte Lysate is optimized for translation and contains an energy-regenerating system (phosphocreatine/phosphocreatine kinase), a mixture of tRNAs (to expand the range of mRNAs that can be translated), hemin (to prevent inhibition of initiation), and potassium chloride and magnesium acetate.
- **Choose Your Configuration:** Learn more about our custom options for this product at: www.promega.com/custom/

Storage Conditions: Store at –70°C or below. Do not freeze-thaw the lysate more than two times.

Flexi® Rabbit Reticulocyte Lysate System

Product	Size	Cat.#
Flexi® Rabbit Reticulocyte Lysate System	30 reactions	L4540
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The Flexi® Rabbit Reticulocyte Lysate System allows translation reactions to be optimized for a wide range of parameters, including Mg^{2+} and K^{+} concentrations and the choice of adding DTT. To help optimize Mg^{2+} for a specific message, the endogenous Mg^{2+} concentration of each lysate batch is stated in the product information included with this product. The Flexi® System also offers the choice of three amino acid mixtures and includes a control RNA encoding the firefly luciferase gene.

Features:

- **Improved Efficiency:** In an optimized system, the quantity of protein produced can be increased as much as fourfold over that of a standard lysate reaction.
- **Easy Optimization:** To aid in optimizing magnesium concentrations, the endogenous magnesium concentration is provided for each lot of Flexi® Lysate.
- **Choice:** The Flexi® System contains three Amino Acid Mixtures, which enable different choices of radioisotopes.
- **Control Included:** Luciferase Control RNA and Luciferase Assay Reagent are included with the system as a functional control. Only full-length luciferase is active.

Storage Conditions: Store at –70°C, except Luciferase Assay Wells, which can be stored at room temperature. Do not freeze-thaw the lysate more than two times.

Rabbit Reticulocyte Lysate/Wheat Germ Extract Combination System

Product	Size	Cat.#
Rabbit Reticulocyte Lysate/Wheat Germ Extract Combination System	24 reactions	L4330
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The Rabbit Reticulocyte Lysate/Wheat Germ Extract Combination System contains both Rabbit Reticulocyte Lysate and Wheat Germ Extract for comparing in vitro translation systems. Reticulocyte Lysate is prepared from New Zealand white rabbits. The Wheat Germ Extract is prepared by grinding wheat germ in an extraction buffer followed by centrifugation to remove cellular debris. Both systems contain the cellular components necessary for protein synthesis. The systems have been treated with micrococcal nuclease, which destroys endogenous mRNA and results in minimal background translation.

Features:

- **Choice:** Test both Rabbit Reticulocyte Lysate and Wheat Germ Systems to find optimal translation systems.
- **Consistent:** Rigorous quality control ensures minimal lot-to-lot variability.
- **Optimal Expression:** Potassium Acetate is provided to enhance the Wheat Germ Extract System for a wide range of mRNAs.

Storage Conditions: Store at –70°C or below. Do not freeze-thaw the lysate more than two times.

Wheat Germ Extract

Product	Size	Cat.#
Wheat Germ Extract	5 × 200 µl	L4380
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Wheat Germ Extract contains the cellular components necessary for protein synthesis (tRNA, ribosomes, initiation, elongation and termination factors). Wheat Germ Extract is prepared by grinding wheat germ in an extraction buffer followed by centrifugation to remove cell debris. The supernatant is subjected to chromatography that separates endogenous amino acids and plant pigments from the extract. The extract is also treated with micrococcal nuclease to destroy endogenous mRNA and thus reduce background translation to a minimum.

Features:

- **Optimized:** Extract contains an energy-regenerating system (phosphocreatine/phosphocreatine kinase), spermidine (to stimulate the efficiency of chain elongation), magnesium acetate and potassium acetate.
- **Flexible:** Three Amino Acid Mixtures are provided, which enable different choices of radioisotopes.
- **Robust:** Potassium Acetate is provided to enhance translation for a wide range of mRNAs.
- **Choose Your Configuration:** Learn more about our custom options for this product at: www.promega.com/custom/

Storage Conditions: Store at –70°C or below. Avoid freeze-thaw cycles.

T7 Sample System

Product	Size	Cat.#
T7 Sample System	1 each	L5900
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The T7 Sample System is designed to facilitate the optimization of individual gene expression by offering four unique in vitro translation systems to evaluate. The system consists of samples of: TnT® T7 Quick for PCR DNA, TnT® T7 Quick Coupled Transcription/Translation System, TnT® Coupled Wheat Germ Extract System and *E. coli* T7 S30 Extract System for Circular DNA.

All of the coupled systems utilize RNA generated by a T7 phage promoter. Criteria such as post-translational modifications, ionic optimization and detection methods (i.e., non-isotopic) should be considered when choosing an in vitro system. In some cases only direct experimental results will confirm which system is best for specific genes.

Features:

- **Variety:** Four major in vitro translation systems to evaluate.
- **Value:** No requirement for the purchase of several large expensive systems.
- **Reliability:** Comprised of rigorously quality-controlled reagents to ensure the highest level of transcription/translation.
- **Optimization:** Determine which system is best for individual genes.

Storage Conditions: Store at –70°C.

Available in the Helix® on-site stocking system
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Available in the Helix® on-site stocking system

Rabbit Reticulocyte Lysate, Untreated

Product	Size	Cat.#
Rabbit Reticulocyte Lysate, Untreated	1 ml	L4151

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Untreated Rabbit Reticulocyte Lysate contains the cellular components necessary for protein synthesis (tRNA, ribosomes, amino acids, initiation, elongation and termination factors) but has not been treated with micrococcal nuclease. Untreated Lysate is used primarily for the isolation of these components and as an abundant source of endogenous globin mRNA. Untreated Lysate is prepared from New Zealand white rabbits in the same manner as treated lysates with the exception that it is not treated with micrococcal nuclease.

Features:

- **Reliable:** Consistent reticulocyte production in each lot.
- **Choose Your Configuration:** Learn more about our custom options for this product at: www.promega.com/custom/

Storage Conditions: Store at –70°C or below.

Luciferase Control RNA

Product	Size Conc.	Cat.#
Luciferase Control RNA	20 µg 1 mg/ml	L4561

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Luciferase Control RNA is a unique functional control for in vitro translation reactions. Luciferase Control RNA is an uncapped in vitro-transcribed RNA containing a 30-base poly(A) tail that produces functional luciferase when translated. Control reactions are monitored easily by a luciferase assay for the production of luminescence generated from the full-length luciferase.

Features:

- **Convenient:** Control reactions are easily monitored by a luciferase assay for luminescence.
- **Safe:** Non-radioactive format to monitor control activity.

Storage Conditions: Store at –70°C.

Luciferase SP6/T7 Control DNAs

Product	Size	Cat.#
Luciferase SP6 Control DNA	20 µg	L4741
Luciferase T7 Control DNA	20 µg	L4821

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Luciferase SP6 and T7 Control DNAs are used as functional controls in the TnT® Quick Coupled and TnT® Coupled Transcription/Translation Systems. The Control DNAs contain the gene for luciferase under transcriptional control of a phage RNA polymerase promoter. All constructs carry a 30-base pair poly[d(A)/d(T)] tail following the luciferase gene. Control reactions are monitored easily by the production of luminescence, which is generated from full-length luciferase and the addition of necessary components. Luciferase Control DNAs are supplied as 0.5mg/ml solutions in TE buffer.

Storage Conditions: Store at –20°C.

Canine Pancreatic Microsomal Membranes

Product	Size	Cat.#
Canine Pancreatic Microsomal Membranes	50 µl	Y4041

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Microsomal vesicles are used to study co-translational and initial post-translational processing of proteins. Processing events such as signal peptide cleavage, membrane insertion, translocation and core glycosylation can be examined by the translation of the appropriate mRNA in vitro in the presence of these microsomal membranes. In addition, processing and glycosylation events may be studied by the transcription/translation of the appropriate DNA in the TnT® Lysate Systems when used with Canine Pancreatic Microsomal Membranes. To assure consistent performance with minimal translational inhibition and background, microsomes have been isolated free from contaminating membrane fractions and stripped of endogenous membrane-bound ribosomes and mRNA. Membrane preparations are assayed for both signal peptidase and core glycosylation activities using two different control mRNAs. The two control mRNAs supplied with this system are the precursor for β-lactamase (or ampicillin resistance gene product) from *E. coli* and the precursor for α-mating factor (or α-factor gene product) from *S. cerevisiae*.

The Signal Sequence Control mRNA (*E. coli* β-lactamase) is transcribed by SP6 RNA polymerase from a plasmid bearing the coding region for the *E. coli* gene encoding the precursor to β-lactamase (the ampicillin resistance gene product). The RNA is synthesized without a cap analog. This control mRNA is used to assay for signal peptidase activity and is supplied with the Canine Pancreatic Microsomal Membranes System.

The Core Glycosylation Control mRNA (*S. cerevisiae* α-factor) is transcribed by SP6 RNA polymerase from a plasmid bearing the coding region for the *S. cerevisiae* α-mating factor. The RNA is synthesized without a cap analog. This control mRNA is used to assay for core glycosylation activity and is supplied with the Canine Pancreatic Microsomal Membranes System.

Features:

- **Reliable:** Microsomes are stripped of endogenous membrane-bound ribosomes and mRNA to ensure consistent performance with minimal translational inhibition and background. Performance tested in rabbit reticulocyte lysate.

Storage Conditions: Store at –70°C or below. Membranes are stable at –70°C for 1 year. After thawing, unused portions should be rapidly refrozen in liquid nitrogen. No detectable loss of activity results after two freeze-thaw cycles.

Amino Acid Mixtures

Product	Size Conc.	Cat.#
Amino Acid Mixture, Complete	175 µl 1 mM	L4461
Amino Acid Mixture Minus Cysteine	175 µl 1 mM	L4471
Amino Acid Mixture Minus Methionine and Cysteine	175 µl 1 mM	L5511
Amino Acid Mixture Minus Leucine	175 µl 1 mM	L9951
Amino Acid Mixture Minus Methionine	175 µl 1 mM	L9961

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Amino Acid Mixture, Complete, is an aqueous solution containing 1mM each of the 20 essential amino acids. This mixture is compatible for use in the Flexi® Lysate, TnT® Lysate and standard Rabbit Reticulocyte Lysate Systems as well as in the Wheat Germ Extract and *E. coli* S30 Systems. Amino Acid Mixtures are also available lacking cysteine, methionine and cysteine, leucine or methionine.

Storage Conditions: Store at –70°C.

Prokaryotic Cell-Free Protein Expression

S30 T7 High-Yield Protein Expression System

Product	Size	Cat.#
S30 T7 High-Yield Protein Expression System	24 reactions	L1110
	8 reactions	L1115

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The *E. coli* S30 T7 High-Yield Protein Expression System is designed to express up to 500µg/ml of protein in 1 hour from plasmid vectors containing a T7 promoter and a ribosome binding site. The protein expression system provides an extract that contains T7 RNA polymerase for transcription and is deficient in OmpT endoproteinase and Ion protease activity. All other necessary components in the system are optimized for protein expression. This results in greater stability and enhanced expression of target proteins.

Features:

- **Obtain Data Faster:** Protein expression in only one hour, not days as with cell-based expression.
- **Complete System:** No requirement to purchase additional reagents.
- **Achieve High Protein Expression:** Express up to 500µg/ml of protein for multiple applications.
- **Scalable:** Convenient screening protocol for high-throughput protein expression.
- **Flexible:** Detect expressed proteins by Coomassie® staining or incorporation of a fluorescence or biotinylated modified tRNA.

Storage Conditions: Store at –70°C.

E. coli T7 S30 Extract System for Circular DNA

Product	Size	Cat.#
E. coli T7 S30 Extract System for Circular DNA	30 reactions	L1130

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The *E. coli* T7 S30 Extract System for Circular DNA simplifies the transcription/translation of DNA sequences cloned in plasmid or λ vectors containing a T7 promoter by providing an extract that contains T7 RNA polymerase for transcription and all components needed for translation. The investigator only supplies cloned DNA containing a T7 promoter and a ribosome binding site. This product is prepared by modifications of the method described by Zubay from an *E. coli* strain B deficient in *Omp*T endoproteinase and *lon* protease activity. This results in greater stability of expressed proteins that would otherwise be degraded by proteases if expressed in vivo.

Features:

- **Flexible:** Can translate using any clone that has a T7 promoter and a ribosome binding site. Other S30 extracts require an *E. coli* promoter.
- **Greater Stability:** Reduced chance of expressed proteins degrading.
- **Complete:** Contains all components needed for coupled transcription/translation.
- **Low Background:** Synthesizes very low levels of endogenous proteins.
- **Optimized:** Premix is optimized for each lot of S30 Extract and contains all other required components (except amino acids), such as ribonucleotides, tRNAs, PEP (phosphoenol pyruvate) and salts.
- **Choose Your Configuration:** Learn more about our custom options for this product at: www.promega.com/custom/

Storage Conditions: Store extract at –70°C. Check individual components for storage temperatures.

E. coli S30 Extract System for Linear Templates

Product	Size	Cat.#
E. coli S30 Extract System for Linear Templates	30 reactions	L1030

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The *E. coli* S30 Extract System for Linear Templates is prepared using minor modifications of the protocol described by Lesley and colleagues and allows successful transcription/translation of linear DNA templates. The investigator need only provide linear DNA containing a prokaryotic *E. coli*-like promoter (such as *lac*UV5, *tac*, λPL (con) and λ-P_R). A ribosome binding site is required to direct the synthesis of proteins in vitro. In vitro-generated RNA from DNA templates lacking an *E. coli* promoter may also be used in this system, but protein yields will be decreased to 1–10% of that produced from linear DNA templates.

Features:

- **Flexible:** Many templates can be used: DNA fragments, PCR-synthesized DNA, ligated overlapping oligonucleotides, in vitro-generated RNA and prokaryotic RNA.
- **Greater Stability:** Reduced chance of expressed proteins degrading.
- **Complete:** Contains all necessary components for coupled transcription/translation.
- **Low Background:** System synthesizes very low levels of endogenous proteins.
- **Optimized:** Premix is optimized for each lot of S30 Extract and contains all other required components (except amino acids), such as ribonucleotides, tRNAs, PEP (phosphoenol pyruvate) and salts.
- **Choose Your Configuration:** Learn more about our custom options for this product at: www.promega.com/custom/

Storage Conditions: Store at –70°C.

Available in the Helix® on-site stocking system

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E. coli S30 Extract System for Circular DNA

Product	Size	Cat.#
E. coli S30 Extract System for Circular DNA	30 reactions	L1020
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The *E. coli* S30 Extract for Circular DNA simplifies the transcription/translation of DNA sequences cloned in plasmid or λ vectors, providing a powerful tool for identifying and characterizing polypeptides. The investigator needs only to supply the cloned DNA containing the appropriate prokaryotic promoter and ribosome binding sites. The S30 Extract for Circular DNA Templates is prepared by modifications of the method described by Zubay from an *E. coli* strain B deficient in *Omp*T endoproteinase and *lon* protease activity. This results in a greater stability of expressed proteins that would otherwise be degraded by proteases if expressed in vivo. The S30 in vitro system also allows higher expression levels of proteins that are normally expressed at low levels in vivo due to the action of host-encoded repressors.

Features:

- **Greater Stability:** Reduced chance of expressed proteins degrading.
- **Complete:** Contains all necessary components for coupled transcription/translation.
- **Low Background:** System synthesizes very low levels of endogenous proteins.
- **Optimized:** Premix is optimized for each lot of S30 Extract and contains all other required components (except amino acids), such as ribonucleotides, tRNAs, PEP (phosphoenol pyruvate) and salts.
- **Choose Your Configuration:** Learn more about our custom options for this product at: www.promega.com/custom/

Storage Conditions: Store at –70°C.

pGEM® β-Gal Control DNA

Product	Size	Cat.#
pGEM® β-Gal Control DNA	20 µg	L4731
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: pGEM® β-Gal Control DNA contains the coding sequence of β-galactosidase downstream of an *E. coli* wildtype *lac*Z promoter. pGEM® β-Gal Control DNA can be used as a positive control in the *E. coli* S30 Extract System for Circular DNA. The wildtype *lac*Z promoter is not efficient for initiating transcription from a linear DNA template. Supplied as a 0.5mg/ml solution in TE buffer.

Storage Conditions: Store at –20°C.

Protease Inhibitor Cocktail

Product	Size	Cat.#
Protease Inhibitor Cocktail, 50X	1 ml	G6521
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Protease Inhibitor Cocktail is used to prevent protein degradation after lysing cells. The product is a mixture of six different protease inhibitors with different target protease specificities. The inhibitor cocktail is EDTA-free and provided as a powder, ready for reconstitution in 1ml of either 100% ethanol or DMSO to obtain a 50X working solution.

Features:

- **Broad Specificity:** Inhibitor cocktail is effective against a diverse number of proteases.
- **Great Potency:** Reagent provides the best-in-class level of protease inhibition.
- **Highly Compatible:** Works with a wide array of protein fusion tags (e.g., Flag®, His tag, GST tag) and capture technologies. It is ideally suited for HaloTag® Technology-based approaches.

Storage Conditions: Store powdered Protease Inhibitor Cocktail at –30 to –10°C. Reconstituted Protease Inhibitor Cocktail can be stored at 2–10°C for 12 months.

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Protein Quantitation and Detection

Products tagged with the Helix® icon are available for distribution through our convenient on-site stocking program in a freezer, refrigerated unit or an ambient cabinet.

For more information visit: **www.promega.com/helix**

Available in the Helix® on-site stocking system

Protein Quantitation

Nano-Glo® HiBiT Extracellular Detection System

Product	Size	Cat.#
Nano-Glo® HiBiT Extracellular Detection System	10ml	N2420
Nano-Glo® HiBiT Extracellular Detection System	100ml	N2421
Nano-Glo® HiBiT Extracellular Detection System	10 × 100ml	N2422

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Nano-Glo® HiBiT Extracellular Detection System quantitates cell-surface or secreted protein expression in minutes using a simple add-mix-read assay format. Using the nonlytic Nano-Glo® HiBiT Extracellular Detection Reagent, any proteins that are tagged with the 11-amino-acid HiBiT peptide and expressed outside of the cell can be specifically quantitated. The detection reagent contains the complementary polypeptide, LgBiT, which spontaneously interacts with the HiBiT tag to reconstitute the bright, luminescent NanoBiT® enzyme. Luminescence is proportional to the amount of HiBiT-tagged protein present outside of the cell over seven orders of magnitude.

Features:

- Specific, live-cell detection of extracellular expressed or secreted proteins.
- Simple add-mix-read assay format—no antibodies required.
- Quantitate over 7 logs of linear dynamic range.

Storage Conditions: Store at –30°C to –10°C.

Nano-Glo® HiBiT Lytic Detection System

Product	Size	Cat.#
Nano-Glo® HiBiT Lytic Detection System	10ml	N3030
Nano-Glo® HiBiT Lytic Detection System	100ml	N3040
Nano-Glo® HiBiT Lytic Detection System	10 × 100ml	N3050

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Nano-Glo® HiBiT Lytic Detection System quantifies cellular protein in minutes with high sensitivity and a broad dynamic range using a simple add-mix-read assay format. The 11-amino-acid HiBiT peptide tag can be added easily to a protein of interest and the total amount of HiBiT-tagged protein in cells measured by adding the Nano-Glo® HiBiT Lytic Detection Reagent. The detection reagent contains the complementing polypeptide LgBiT, which spontaneously interacts with the HiBiT tag to reconstitute the bright, luminescent NanoBiT® enzyme. The luminescence intensity is directly proportional to the amount of HiBiT-tagged protein in the cell lysate over seven orders of magnitude. The glow-type luminescent signal is stable for hours.

Features:

- Sensitive bioluminescent protein detection.
- Simple add-and-read assay—no antibodies required.
- Quantitate over 7 logs of linear dynamic range.

Storage Conditions: Store at –30°C to –10°C.

Nano-Glo® HiBiT Blotting System

Product	Size	Cat.#
Nano-Glo® HiBiT Blotting System	100ml	N2410

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Nano-Glo® HiBiT Blotting System visualizes HiBiT-tagged proteins on blots at subpicogram levels. The reaction uses a detection reagent containing LgBiT Protein, which complements the HiBiT tag to form the luminescent NanoBiT® enzyme. The blotting system requires as little as 5 minutes to detect HiBiT-tagged proteins on a nitrocellulose membrane. Standard antibody-based blotting protocols can take multiple hours to detect the protein of interest.

Features:

- Determine protein size and quantify expression on blots.
- Protocol requires only minutes, with few processing steps.
- Femtogram sensitivity proportional over five orders of magnitude.

Storage Conditions: Store at –30°C to –10°C.

pBiT3.1 HiBiT MCS Vectors

Product	Size	Conc.	Cat.#
pBiT3.1-N [CMV/HiBiT/Blast] Vector	20µg	1µg/µl	N2361
pBiT3.1-C [CMV/HiBiT/Blast] Vector	20µg	1µg/µl	N2371
pBiT3.1-secN [CMV/HiBiT/Blast] Vector	20µg	1µg/µl	N2381

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The three pBiT3.1 HiBiT Vectors are configured to append the 11-amino-acid HiBiT peptide tag to the amino or carboxy terminus of the target protein. These vectors contain a multiple cloning region to generate an in-frame HiBiT fusion protein. The pBiT3.1 Vectors can be used for both stable and transient gene expression and encode kanamycin resistance for bacterial selection and blasticidin resistance for mammalian selection. The flexible linker between the protein of interest and the HiBiT tag will vary in length, depending on the restriction enzyme used.

The pBiT3.1-N [CMV/HiBiT/Blast] Vector appends the HiBiT tag to the N terminus of the gene of interest. The insert should contain a stop codon at the 3´ end for termination of the translation.

The pBiT3.1-C [CMV/HiBiT/Blast] Vector adds the HiBiT tag to the N terminus of the gene of interest. **Note:** The insert should not encode a stop codon, and the gene of interest should contain proper translation initiation sequences, including an N-terminal ATG codon or Kozak sequence.

The pBiT3.1-secN [CMV/HiBiT/Blast] Vector attaches the HiBiT tag to the N terminus of the mature form of transmembrane or secreted proteins. This vector encodes the IL-6 secretion signal peptide N-terminal to the HiBiT tag for direct trafficking of HiBiT-tagged proteins to the plasma membrane of mammalian cells for cell surface expression or secretion. **Note:** The insert should also contain a stop codon at the 3´ end for termination of the translation.

The HiBiT peptide tag, in combination with the Nano-Glo® HiBiT Detection Systems, offers bioluminescent detection of the protein of interest. This results in quantitation of proteins using bioluminescence with no need for antibodies.

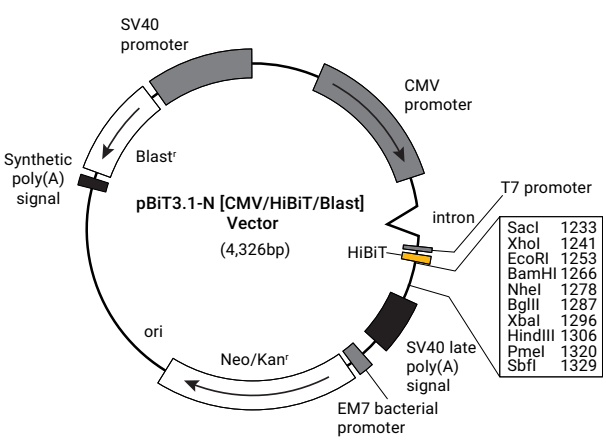
Notes:

1. Expression of the HiBiT-tagged protein will only occur when the proper reading frame is maintained between the HiBiT tag and the gene of interest.
2. The HiBiT peptide sequence is provided for reference only. To obtain rights to synthesize the HiBiT tag, please see the Terms and Conditions of Use at: **www.promega.com/HiBiT-Synthesis**

Features:

- Add an N- or C-terminal HiBiT tag to your protein of interest.
- Generate an N-terminal HiBiT-tagged transmembrane or secreted protein.
- Use for expression analysis and protein quantitation using luminescent detection reagents.

Storage Conditions: Store at –30°C to –10°C.



HiBiT CMV-Neo Flexi® Vectors

Product	Size	Conc.	Cat.#
pFC37K HiBiT CMV-neo Flexi® Vector	20µg	1µg/µl	N2391
pFN38K HiBiT CMV-neo Flexi® Vector	20µg	1µg/µl	N2401
pFN39K secHiBiT CMV-neo Flexi® Vector	20µg	1µg/µl	N2411

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The three HiBiT CMV-neo Flexi® Vectors are configured to facilitate simple, efficient transfer of the gene of interest into a vector designed for genetic attachment of the HiBiT peptide tag to the amino or carboxy terminus of the protein of interest using the Flexi® Cloning System (Cat.# C8640). The vectors can be used for both stable and transient gene expression and encode kanamycin resistance for bacterial selection and neomycin resistance for mammalian selection.

The pFC37K HiBiT CMV-neo Flexi® Vector appends the HiBiT to the C terminus of the gene of interest.

The pFN38K HiBiT CMV-neo Flexi® Vector adds the HiBiT tag to the N terminus of the gene of interest.

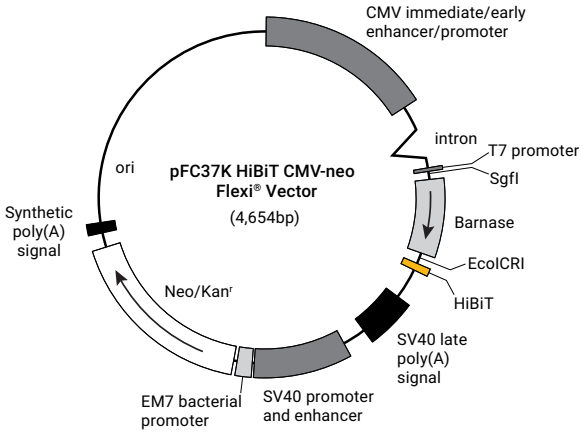
The pFN39K secHiBiT CMV-neo Flexi® Vector attaches the HiBiT tag to the N terminus of the gene of interest. This vector encodes the IL-6 secretion signal peptide N-terminal to the HiBiT tag for direct trafficking of HiBiT-tagged proteins to the plasma membrane of mammalian cells for cell surface expression and secreted proteins. **Note:** We recommend removing naturally encoded secretion signal sequences from the gene of interest for efficient cell-surface expression of the HiBiT-tagged protein.

The HiBiT peptide tag, in combination with the Nano-Glo® HiBiT Detection Systems, offers bioluminescent detection of the protein of interest. This results in quantitation of proteins using bioluminescence with no need for antibodies.

Features:

- Add an N- or C-terminal HiBiT tag to your protein of interest.
- Generate an N-terminal HiBiT-tagged transmembrane or secreted protein.
- Use with the Flexi® Cloning System to transfer ORF insert.

Storage Conditions: Store at –30°C to –10°C.



Available in the Helix® on-site stocking system

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Protease Assays

DPPIV-Glo™ Protease Assay

Product	Size	Cat.#
DPPIV-Glo™ Protease Assay	10 ml	G8350
	50 ml	G8351

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The DPPIV-Glo™ Protease Assay is a homogeneous, luminescent assay that measures dipeptidyl peptidase IV (DPPIV) activity. DPPIV is a serine protease that cleaves N-terminal dipeptides from polypeptides with L-proline or L-alanine at the penultimate position. The DPPIV-Glo™ Assay provides a proluminescent DPPIV substrate, Gly-Pro-aminoluciferin, in a buffer system optimized for DPPIV and luciferase activities. The addition of a single DPPIV-Glo™ Reagent in an "add-mix-measure" format results in DPPIV cleavage of the substrate and generation of a "glow-type" luminescent signal produced by the luciferase reaction. In this homogeneous, coupled-enzyme format, the signal is proportional to the amount of DPPIV activity present. The assay is designed for use with purified enzyme preparations.

Features:

- **Simplified Method:** The homogeneous "add-mix-measure" protocol makes the assay highly amenable to automation.
- **Greater Sensitivity:** The assay is more sensitive than fluorescent-based DPPIV assays. In contrast to fluorescent assays, the luminescent assay avoids inherent fluorescent background signals and thus provides excellent signal-to-background readings. The assay is linear over more than 3 logs of DPPIV concentration and can detect less than 1pg/ml enzyme.
- **Faster Results:** The maximum signal (and maximum sensitivity) of the assay is reached in as little as 30 minutes after reagent addition and, unlike fluorescent assays, is not dependent on accumulation of cleaved product.
- **Amenable to Batch Processing:** The stability of the signal means that plates can be read over an extended period of time.

Storage Conditions: Store components at –20°C protected from light.

Proteasome-Glo™ Assays

Product	Size	Cat.#
Proteasome-Glo™ Chymotrypsin-Like Assay	10 ml	G8621
	50 ml	G8622
Proteasome-Glo™ Trypsin-Like Assay	10 ml	G8631
	50 ml	G8632
Proteasome-Glo™ Caspase-Like Assay	10 ml	G8641
	50 ml	G8642
Proteasome-Glo™ 3-Substrate System	10 ml	G8531
	50 ml	G8532

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The **Proteasome-Glo™ Assays** are homogeneous, luminescent assays that individually measure the chymotrypsin-like, trypsin-like and caspase-like protease activities associated with the proteasome in a purified enzyme-based format. The 26S proteasome is a 2.5MDa multiprotein complex found in all eukaryotic cells. Adding the Proteasome-Glo™ Cell-Based Reagent in an "add-mix-measure" format results in proteasome cleavage of the substrate and rapid generation of a luminescent signal produced by the luciferase reaction.

The three luminogenic substrates used to monitor specific protease activities include: Suc-LLVY-aminoluciferin for chymotrypsin-like, Z-LRR-aminoluciferin for trypsin-like, and Z-nLPnLD-aminoluciferin for caspase-like activity. Each luminogenic substrate is added to a buffer system optimized for its specific proteasome activity and luciferase activity. The reagents are added to test samples containing proteasome enzyme that cleaves the substrates, releasing luciferin, which is consumed by luciferase, producing "glow-type" luminescence correlating to enzyme activity or inhibition.

The **Proteasome-Glo™ 3-Substrate System** consists of three homogeneous bioluminescent assays in an enzyme-based format (each of these three assays also is available separately).

The **Proteasome-Glo™ Cell-Based 3-Substrate System** consists of three homogeneous bioluminescent assays that measure the three proteolytic activities associated with the proteasome in a cell-based format (each of these three assays also is available separately).

Features:

- **Simplified Method:** The "add-mix-measure" protocol minimizes handling steps and makes the assays amenable to automation.
- **Faster Results:** Maximum sensitivity is reached 10–30 minutes after reagent addition.
- **Greater Sensitivity:** The luminescent assay format avoids inherent fluorescent background signals, providing excellent signal-to-background readings. The assays are miniaturizable to 384-well format.

Storage Conditions: Store the Proteasome-Glo™ Assay components at –20°C.

Cell-Based Proteasome-Glo™ Assays

Product	Size	Cat.#
Proteasome-Glo™ Chymotrypsin-Like Cell-Based Assay	10 ml	G8660
	5 × 10 ml	G8661
	2 × 50 ml	G8662
Proteasome-Glo™ Trypsin-Like Cell-Based Assay	10 ml	G8760
	5 × 10 ml	G8761
Proteasome-Glo™ Caspase-Like Cell-Based Assay	10 ml	G8860
	5 × 10 ml	G8861
Proteasome-Glo™ 3-Substrate Cell-Based Assay System	10 ml	G1180
	50 ml	G1200

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The **Proteasome-Glo™ Cell-Based Assays** are homogeneous, luminescent assays that individually measure the chymotrypsin-like, trypsin-like and caspase-like protease activities associated with the proteasome complex in cultured cells. The 26S proteasome is a 2.5MDa multiprotein complex found in all eukaryotic cells. Proteasome-Glo™ Cell-Based Assays provide luminogenic proteasome substrates in buffers optimized for cell permeabilization, proteasome activity and luciferase activity. Addition of the Proteasome-Glo™ Cell-Based Reagent in an "add-mix-measure" format results in proteasome cleavage of the substrate and rapid generation of a luminescent signal produced by the luciferase reaction.

The three luminogenic substrates used to monitor specific protease activities include: Suc-LLVY-aminoluciferin for chymotrypsin-like, Z-LRR-aminoluciferin for trypsin-like, and Z-nLPnLD-aminoluciferin for caspase-like activity. Each luminogenic substrate is added to a buffer system optimized for its specific proteasome activity and luciferase activity. The reagents are added to cells in culture, and the proteasome cleaves the substrates, releasing luciferin, which is consumed by luciferase, producing "glow-type" luminescence correlating to enzyme activity or inhibition.

The **Proteasome-Glo™ Cell-Based 3-Substrate System** consists of three homogeneous bioluminescent assays that measure the three proteolytic activities associated with the proteasome in a cell-based format (each of these three assays also is available separately).

The **Proteasome-Glo™ 3-Substrate System** consists of three homogeneous bioluminescent assays in a purified enzyme-based format (each of these three assays also is available separately).

Features:

- **More Biologically Relevant Results:** Obtain activity data directly from a cellular environment with the Proteasome-Glo™ Cell-Based Assay.
- **Simplified Method:** The "add-mix-measure" protocol minimizes handling steps and makes the assays amenable to automation.
- **Faster Results:** Maximum sensitivity is reached 10–30 minutes after reagent addition.
- **Greater Sensitivity:** The luminescent assay format avoids inherent fluorescent background signals, providing excellent signal-to-background readings. The assays are miniaturizable to 384-well format.

Storage Conditions: Store the Proteasome-Glo™ Assay components at –20°C.

Calpain-Glo™ Protease Assay

Product	Size	Cat.#
Calpain-Glo™ Protease Assay	10 ml	G8501
	50 ml	G8502

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Calpain-Glo™ Protease Assay is a homogeneous, luminescent assay that measures calpain 1 (μ) and 2 (m) activities. Calpains are a family of calcium-activated cysteine proteases involved in cleaving a wide variety of proteins. Calpains modulate the biological activities of their substrates via limited proteolysis.

The Calpain-Glo™ Protease Assay provides a succinyl, proluminescent calpain substrate, Suc-LLVY-aminoluciferin, in a buffer system optimized for calpain and luciferase activities. The addition of the calpain reagent in an "add-mix-measure" format results in calpain cleavage of the substrate and rapid development of a "glow-type" luminescent signal produced by the luciferase reaction. The signal is proportional to the amount of calpain activity present. The assay is designed for use with purified enzyme preparations.

Features:

- **Faster Results:** The homogeneous, enzyme-coupled format is especially well suited for rapidly autolysed enzymes like calpain; maximum sensitivity is reached in as little as 10 minutes, while the enzyme is fully active.
- **Simple Protocol:** The homogeneous "add-mix-measure" protocol makes the assay easy to automate.
- **Greater Sensitivity:** The assay is up to 1,000 times more sensitive than competitive fluorometric assays. The luminescent assay avoids inherent fluorescent background signals, providing excellent signal-to-background readings. The assay is linear over 4 logs of calpain concentration.

Storage Conditions: Store components at –20°C protected from light.

Available in the Helix® on-site stocking system

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Tryptase, Human, Recombinant, β

Product	Size	Cat.#
rhSkin β Tryptase	100 µg	G7061
rhLung β Tryptase	100 µg	G5631

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Tryptase is the predominant protein in mast cell granules and cleaves proteins at arginine and lysine residues. Tryptase is stored and released from mast cell granules upon activation. Mast cells are found in many tissues but are present in greater numbers along epithelial linings of the body, such as the skin, respiratory tract and gastrointestinal tract, as well as the perivascular tissue surrounding blood vessels. They are involved in a variety of physiological and pathophysiological states, including immediate hypersensitivity, delayed-type hypersensitivity, cell growth regulation, defense against neoplasia, and pain and itch sensation. They have also been implicated in chronic inflammatory states and are involved in neuroimmune interactions. The availability of recombinant human tryptase will aid in research directed toward a more complete understanding of the biological role(s) of tryptase and mast cells and the identification of tryptase in vivo targets.

Skin β_I Tryptase, Human, Recombinant (rhSkin β Tryptase) and Lung β_{II} Tryptase, Human, Recombinant (rhLung β Tryptase) are neutral serine proteases. The human β tryptase enzymes have been cloned and stably expressed in *Pichia pastoris* as fully active tetrameric enzymes and purified by affinity chromatography. The two enzymes differ in buffer formulation, enzyme concentration and glycosylation pattern. rhLung Tryptase is provided at a much higher concentration (2mg/ml) in minimal buffer without heparin for chromatographic studies and with glycosylation more closely resembling cadaveric enzyme as demonstrated by glycosidase digestion followed by Western analysis of the two recombinant enzymes and native lung tryptase.

Specific Activity: Measured as the rate of hydrolysis of 0.4mM Nα CBZ-L-Lysine Thiobenzyl Ester as substrate coupled with Ellman's Reagent [5,5′-Dithio-bis(5-Nitrobenzoic Acid)] in a final volume of 1ml, incubating for 1 minute at 25°C, and monitoring the absorbance change at 410nm. One unit is defined as 1.0 absorbance unit change per minute.

- rhSkin β Tryptase: >1,000 units/mg protein.
- rhLung β Tryptase: >1,200 units/mg protein.

Concentration:

- rhSkin β Tryptase: 200µg/ml.
- rhLung β Tryptase: 2mg/ml.

Features:

- **High Specific Activity:** Specific activity is consistently 130–150% higher than native lung tryptase.
- **Consistent:** Recombinant protein expression results in uniform enzyme from batch to batch.
- **Safe:** Void of human pathogens associated with native cadaveric tryptase.
- **Pure:** Skin β and Lung β Tryptase are free of other contaminating proteases, providing more active enzyme per milligram of protein and eliminating extraneous protein interactions observed with native tryptase.

Storage Conditions: Store at –20°C.

Protein Labeling

HaloTag® Ligands for Super Resolution Microscopy

Product	Size	Cat.#
Janelia Fluor® 549 HaloTag® Ligand	5µg	GA1110
	3 × 5µg	GA1111
Janelia Fluor® 646 HaloTag® Ligand	5µg	GA1120
	3 × 5µg	GA1121

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Janelia Fluor® 549 HaloTag® Ligand and Janelia Fluor® 646 HaloTag® Ligand enable characterization of HaloTag® fusions in endogenous cellular settings. The enhanced brightness of the dyes associated with the HaloTag® ligands enables their use in detection and single-molecule imaging studies in live cells via: FACS, standard confocal imaging and in-gel detection with a fluoroimager.

Features:

- Single-molecule labeling
- Rapid cell labeling
- High signal-to-noise ratio and specificity

Storage Conditions: Store at –30°C to –10°C.

HaloTag® Fluorescent Ligands

Product	Size Conc.	Cat.#
HaloTag® TMR Ligand	30 µl 5 mM	G8251
	15 µl 5 mM	G8252
HaloTag® Oregon Green® Ligand	30 µl 1 mM	G2801
	15 µl 1 mM	G2802
HaloTag® diAcFAM Ligand	30 µl 1 mM	G8272
	15 µl 1 mM	G8273
HaloTag® Coumarin Ligand	30 µl 10 mM	G8581
	15 µl 10 mM	G8582
HaloTag® Alexa Fluor® 488 Ligand	30 µl 1 mM	G1001
	15 µl 1 mM	G1002
HaloTag® Alexa Fluor® 660 Ligand	30 µl 3.5 mM	G8471
	15 µl 3.5 mM	G8472
HaloTag® TMRDirect™ Ligand	30 µl 0.1 mM	G2991
HaloTag® R110Direct™ Ligand	30 µl 0.1 mM	G3221
HaloTag® Biotin Ligand	30 µl 5 mM	G8281
	15 µl 5 mM	G8282
HaloTag® PEG-Biotin Ligand	30 µl 5 mM	G8591
	15 µl 5 mM	G8592

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Description: The HaloTag® Fluorescent Ligands can carry a variety of functionalities, including fluorescent labels, affinity tags and attachments to a solid phase. The covalent bond forms rapidly under general physiological conditions, is highly specific and essentially irreversible. The HaloTag® Fluorescent Ligands allow researchers to apply the chloroalkane group that HaloTag® protein reacts with to any compound or surface with a compatible chemical group, creating endless possible applications.

HaloTag® Fluorescent Ligands for Cellular Imaging

Cell-permeant fluorescent ligands (rapid labeling protocol):

- HaloTag® TMR Ligand ($555_{Ex}/585_{Em}$)
- HaloTag® Oregon Green® Ligand ($496_{Ex}/516_{Em}$)
- HaloTag® diAcFAM Ligand ($494_{Ex}/526_{Em}$)
- HaloTag® Coumarin Ligand ($353_{Ex}/434_{Em}$)

Cell-impermeant fluorescent ligands for cell-surface labeling (rapid labeling protocol):

- HaloTag® Alexa Fluor® 488 Ligand ($494_{Ex}/517_{Em}$)
- HaloTag® Alexa Fluor® 660 Ligand ($663_{Ex}/690_{Em}$)

Cell-permeant fluorescent ligands (“no wash” protocol):

- HaloTag® TMRDirect™ Ligand ($555_{Ex}/585_{Em}$)
- HaloTag® R110Direct™ Ligand ($502_{Ex}/527_{Em}$)

The Alexa Fluor® 488 Ligand is impermeable to cell membranes and, therefore, used to label cell surface proteins. The TMR Ligand, Oregon Green® Ligand, diAcFAM Ligand and Coumarin Ligand readily cross the cell membrane and, therefore, can be used to label intracellular proteins.

HaloTag® Ligands for Protein Detection

The HaloTag® Biotin Ligand consists of a 12-atom linker arm to biotin and is used as an affinity tag to capture the HaloTag® protein-based fusion construct using the strong biotin-streptavidin interaction.

The HaloTag® PEG-Biotin Ligand contains a spacer not found in the HaloTag® Biotin Ligand. This provides a significantly longer and more flexible linker between streptavidin and the HaloTag® protein, which may be advantageous in preserving the activity of a HaloTag® fusion partner protein upon immobilization or derivatization.

Features:

- **Label in Solution or on a Solid Support:** The HaloTag® Ligands bind to the HaloTag® protein or protein fusions with high specificity and affinity.
- **Label Your HaloTag® Protein in Live Cells:** The HaloTag® TMR, diAcFAM, Coumarin and Biotin Ligands readily cross the cell membrane.
- **Pull Down Protein Complexes:** The spacer and reactive linker of the HaloTag® PEG-Biotin Ligand provide ideal pull-down capabilities. Alternatively, pull down directly with the HaloLink™ Resin.
- **Image Fixed Cells:** The covalent bond is stable, allowing imaging of fixed cells and analysis of the labeled protein under stringent conditions.
- **Introduce Novel Functionalities or Perform Sequential Labeling:** The open architecture of the technology enables the use of different ligands for multiple applications.
- **Design Only One Genetic Construct for Multiple Experiments:** Obtain new functionality by using a different HaloTag® Ligand without having to design and clone a new expression construct.
- **Analyze Labeled Fusion Proteins Using SDS-PAGE, Mass Spectrometry:** The bound ligand is stable under denaturing conditions.

Available in the Helix® on-site stocking system

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HaloTag® Ligand Building Blocks

Product	Size	Cat.#
HaloTag® Amine (04) Ligand	5 mg	P6741
HaloTag® Amine (02) Ligand	5 mg	P6711
HaloTag® Iodoacetamide (04) Ligand	5 mg	P6771
HaloTag® Succinimidyl Ester (04) Ligand	5 mg	P6751
HaloTag® Succinimidyl Ester (02) Ligand	5 mg	P1691

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The HaloTag® Ligand Building Blocks can carry a variety of functionalities, including fluorescent labels, affinity tags and attachments to a solid phase. The covalent bond forms rapidly under general physiological conditions, is highly specific and essentially irreversible. The HaloTag® Ligand Building Blocks allow researchers to apply the chloroalkane group that HaloTag® protein reacts with to any compound or surface with a compatible chemical group, creating endless possible applications.

The HaloTag® Succinimidyl Ester (04) Ligand contains a reactive succinimidyl ester (SE) group connected to an alkyl chloride separated by three ethylene glycol repeats (04). The HaloTag® Succinimidyl Ester (04) Ligand can be successfully conjugated to any reporter group, protein, or nucleic acid derivative containing an amine, forming stable amide bond linkages. The ligand with functional group can then be used with the HaloTag® protein for any application of interest.

The HaloTag® Succinimidyl Ester (O2) Ligand contains a reactive succinimidyl ester (SE) group connected to an alkylchloride separated by an ethylene glycol repeat (O2). The HaloTag® Succinimidyl Ester (O2) Ligand can be successfully conjugated to any reporter group, protein, or nucleic acid derivative containing an amine, forming stable amide bond linkages. The ligand with functional group can then be used with the HaloTag® protein for any application of interest.

The HaloTag® Amine (04) Ligand contains a reactive amine group connected to an alkyl chloride, separated by an ethylene glycol repeat (04). The HaloTag® Amine (04) Ligand can be successfully conjugated to any reporter group, protein, or nucleic acid derivative containing an activated carboxylic acid, sulfonyl halide or isocyanate. Examples of activated carboxylic acids are succinimidyl esters, STP esters, acid halides, and TFP esters. The ligand with functional group can then be used with the HaloTag® protein for any application of interest.

The HaloTag® Amine (O2) Ligand contains a reactive amine group connected to an alkylchloride, separated by an ethylene glycol repeat (O2). The HaloTag® Amine (O2) Ligand can be successfully conjugated to any reporter group, protein, or nucleic acid derivative containing an activated carboxylic acid, sulfonyl halide or isocyanate. Examples of activated carboxylic acids are succinimidyl esters, STP esters, acid halides and TFP esters. The ligand with functional group can then be used with the HaloTag® protein for any application of interest.

The HaloTag® Iodoacetamide (04) Ligand contains a reactive iodoacetamide group connected an alkyl chloride separated by an ethylene glycol repeat (04). The HaloTag® Iodoacetamide (04) Ligand has been designed to rapidly react with sulfhydryl-containing molecules (see figure), whether small organic compounds, peptides or proteins. The ligand with functional group can then be used with the HaloTag® protein for any application of interest.

Storage Conditions: Store Cat.# P1691 and P6751 at or below –70°C under inert atmosphere. Store Cat.# P6711 and P6741 at or below –20°C in an air-tight container in the absence of light. Store Cat.# P6771 at or below –20°C under inert atmosphere in the absence of light. See Promega Product Information for additional details on individual products.

HaloTag® Fusion (C-Terminal) Mammalian Expression Vectors

Product	Size	Cat.#
pHTC HaloTag® CMV-neo Vector	20 µg	G7711
pFC27A HaloTag® CMV-neo Flexi® Vector	20 µg	G8421
pFC27K HaloTag® CMV-neo Flexi® Vector	20 µg	G8431
pFC14A HaloTag® CMV Flexi® Vector	20 µg	G9651
pFC14K HaloTag® CMV Flexi® Vector	20 µg	G9661
pFC15A HaloTag® CMV*d1* Flexi® Vector	20 µg	G1611
pFC15K HaloTag® CMV*d1* Flexi® Vector	20 µg	G1601
pFC16A HaloTag® CMV*d2* Flexi® Vector	20 µg	G1591
pFC16K HaloTag® CMV*d2* Flexi® Vector	20 µg	G1571
pFC17A HaloTag® CMV*d3* Flexi® Vector	20 µg	G1551
pFC17K HaloTag® CMV*d3* Flexi® Vector	20 µg	G1321
Available Separately		
HaloTag® Cloning Starter System	1 each	G6050
HaloTag® Flexi® Vectors—CMV Deletion Series Sample Pack	9 × 2 µg	G3780
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: These vectors are designed for expression of C-terminal-tagged HaloTag® fusion proteins in mammalian cells. Once expressed, the HaloTag® fusion protein may be used for cell imaging of protein localization or trafficking in conjunction with the fluorescent HaloTag® Ligands. In addition, the HaloTag® fusion protein can be purified or pulled down as a complex with its protein partners.

We offer two types of HaloTag® fusion vectors to accommodate your cloning preferences:

- **pHT Vector Series:** Simple Multiple Cloning Site (MCS) plasmids for traditional cloning.
- **pF Vector Series**: Flexi® Vector Cloning System—a directional cloning method for protein-coding sequences. It is based on two rare-cutting restriction enzymes, SgfI and PmeI, and provides a rapid, efficient and high-fidelity way to transfer protein-coding regions between a variety of Flexi® Vectors without the need to resequence.

Note: Flexi® Vectors contain the lethal barnase gene to reduce background colonies without inserts during the subcloning procedure. Using the Flexi® Vector Cloning System replaces the barnase gene with your insert. These vectors, as purchased, cannot be cultured in normal laboratory strains of *E. coli* without an insert.

Features:

- **Versatility:** You can choose between a variety of initial applications (e.g., bacterial protein, mammalian, or cell-free protein expression) and then transfer to others as required.
- **Time Savings:** Efficient transfer allows direct use of recombinant clones, minimizing time wasted screening background colonies.
- **Enhanced Productivity:** Adaptable to high-throughput formats for large screening projects.
- **Easy Access:** No licensing fees or complicated transfer restrictions.

Storage Conditions: Store vectors at –20°C.

HaloTag® Fusion (N-Terminal) Mammalian Expression Vectors

Product	Size	Cat.#
pHTN HaloTag® CMV-neo Vector	20 µg	G7721
pFN28A HaloTag® CMV-neo Flexi® Vector	20 µg	G8441
pFN28K HaloTag® CMV-neo Flexi® Vector	20 µg	G8451
pFN21A HaloTag® CMV Flexi® Vector	20 µg	G2821
pFN21K HaloTag® CMV Flexi® Vector	20 µg	G2831
pFN22A HaloTag® CMV*d1* Flexi® Vector	20 µg	G2841
pFN22K HaloTag® CMV*d1* Flexi® Vector	20 µg	G2851
pFN23A HaloTag® CMV*d2* Flexi® Vector	20 µg	G2861
pFN23K HaloTag® CMV*d2* Flexi® Vector	20 µg	G2871
pFN24A HaloTag® CMV*d3* Flexi® Vector	20 µg	G2881
pFN24K HaloTag® CMV*d3* Flexi® Vector	20 µg	G2981
Available Separately		
HaloTag® Cloning Starter System	1 each	G6050
HaloTag® Flexi® Vectors—CMV Deletion Series Sample Pack	9 × 2 µg	G3780
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: These vectors are designed for expression of N-terminal-tagged HaloTag® fusion proteins in mammalian cells. Once expressed, the HaloTag® fusion protein may be used for cell imaging of protein localization or trafficking in conjunction with the fluorescent HaloTag® Ligands. In addition, the HaloTag® fusion protein can be purified or pulled down as a complex with its protein partners.

We offer two types of HaloTag® fusion vectors to accommodate your cloning preferences:

- **pHT Vector Series:** Simple Multiple Cloning Site (MCS) plasmids for traditional cloning.
- **pF Vector Series**: Flexi® Vector Cloning System—a directional cloning method for protein-coding sequences. It is based on two rare-cutting restriction enzymes, SgfI and PmeI, and provides a rapid, efficient and high-fidelity way to transfer protein-coding regions between a variety of Flexi® Vectors without the need to resequence.

Note: Flexi® Vectors contain the lethal barnase gene to reduce background colonies without inserts during the subcloning procedure. Using the Flexi® Vector Cloning System replaces the barnase gene with your insert. These vectors, as purchased, cannot be cultured in normal laboratory strains of *E. coli* without an insert.

Features:

- **Versatility:** You can choose between a variety of initial applications (e.g., bacterial protein, mammalian, or cell-free protein expression) and then transfer to others as required.
- **Time Savings:** Efficient transfer allows direct use of recombinant clones, minimizing time wasted screening background colonies.
- **Enhanced Productivity:** Adaptable to high-throughput formats for large screening projects.
- **Easy Access:** No licensing fees or complicated transfer restrictions.

Storage Conditions: Store vectors at –20°C.

Available in the Helix® on-site stocking system

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Available in the Helix® on-site stocking system

HaloTag® Vectors for *E. coli* and Cell-Free Protein Expression

Product	Size	Cat.#
pH6HTN His_6HaloTag® T7 Vector	20 µg	G7971
pH6HTC His_6HaloTag® T7 Vector	20 µg	G8031
pF1A T7 Flexi® Vector	20 µg	C8441
pF1K T7 Flexi® Vector	20 µg	C8451
pFN18A HaloTag® T7 Flexi® Vector	20 µg	G2751
pFN18K HaloTag® T7 Flexi® Vector	20 µg	G2681
pFN19A HaloTag® T7 SP6 Flexi® Vector	20 µg	G1891
pFN19K HaloTag® T7 SP6 Flexi® Vector	20 µg	G1841
pFC20A HaloTag® T7 SP6 Flexi® Vector	20 µg	G1681
pFC20K HaloTag® T7 SP6 Flexi® Vector	20 µg	G1691
pFN29A His_6HaloTag® T7 Flexi® Vector	20 µg	G8261
pFN29K His_6HaloTag® T7 Flexi® Vector	20 µg	G8331
pFC30A His_6HaloTag® T7 Flexi® Vector	20 µg	G8321
pFC30K His_6HaloTag® T7 Flexi® Vector	20 µg	G8381

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The following vectors are used for inducible expression of HaloTag® fusion proteins in *E. coli* and cell-free systems using the T7 RNA polymerase promoter. Expression levels depend highly on the nature of the protein, but in general the N-terminal HaloTag® fusion protein (e.g., pFN18A/K, Cat.# G2751, G2681) can increase expression level, enhance refolding and boost solubility of the expressed protein. HaloTag® vectors are supplied in two formats: as multiple cloning site (MCS) vectors for traditional cloning and as Flexi® System vectors.

The Flexi® Vector System is a simple, directional cloning method for protein-coding sequences. It is based on two rare-cutting restriction enzymes, SgfI and PmeI, and provides a rapid, efficient and high-fidelity way to transfer protein-coding regions between a variety of Flexi® Vectors without the need to resequence. Direct transfers can only occur between two N-terminal tagged vectors or from an N-terminal to a C-terminal vector. The MCS vectors and several Flexi® system vectors contain a His_6-HaloTag® dual tag. The dual tag enables protein purification with the reusable Ni-resin while retaining the HaloTag® covalent labeling properties.

Multiple Cloning Site (MCS) Vectors

pH6HTN His_6HaloTag® T7 Vector (Cat.# G7971) is designed for protein expression with an N-terminal His_6-HaloTag® dual tag in *E. coli* and T7 cell-free expression systems.

pH6HTC His_6HaloTag® T7 Vector (Cat.# G8031) is designed for protein expression with a C-terminal His_6-HaloTag® dual tag in *E. coli* and T7 cell-free expression systems.

Flexi® System Vectors

pF1A/K T7 Flexi® Vectors (Cat.# C8441, C8451) are designed for untagged protein expression.

pFN18A/K HaloTag® T7 Flexi® Vectors (Cat.# G2751, G2681) are designed for protein expression with an N-terminal HaloTag® in *E. coli* and T7 cell-free expression systems.

pFN19A/K HaloTag® T7 SP6 Flexi® Vectors (Cat.# G1891, G1841) are designed for protein expression with an N-terminal HaloTag® in T7 and SP6 cell-free expression systems. These vectors are optimized for cell-free expression systems.

pFC20A/K HaloTag® T7 SP6 Flexi® Vectors (Cat.# G1681, G1691) are designed for protein expression with a C-terminal HaloTag® in *E. coli* and SP6 cell-free expression systems. These vectors are optimized for cell-free expression systems.

pFN29A/K His_6HaloTag® T7 Flexi® Vectors (Cat.# G8261, G8331) are designed for protein expression with an N-terminal His_6-HaloTag® dual tag in *E. coli* T7 cell-free expression systems.

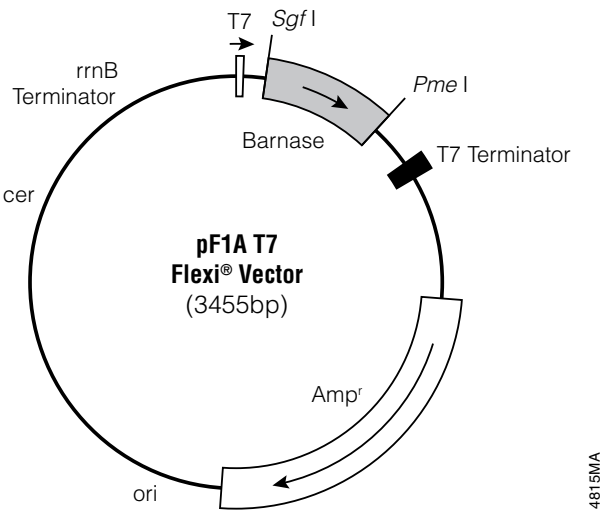
pFC30A/K His_6HaloTag® T7 Flexi® Vectors (Cat.# G8321, G8381) are designed for protein expression with a C-terminal His_6-HaloTag® dual tag in *E. coli* T7 cell-free expression systems.

Note: Flexi® Vectors contain the lethal barnase gene to reduce background colonies without inserts during the subcloning procedure. Using the Flexi® Vector Cloning System replaces the barnase gene with your insert. These vectors, as purchased, cannot be cultured in normal laboratory strains of *E. coli* without an insert.

Features:

- **Choice of Systems:** Choose between traditional (MCS) and Flexi® cloning to get the benefits of HaloTag® technology.
- **Dual Tag:** Couple the protein solubility and labeling benefits of HaloTag® technology with the reusability and the throughput of Ni-affinity technology.
- **Versatile Cloning:** Choose from a variety of expression systems and fusion tag orientations and then transfer to others as required (for Flexi® system).
- **Time Savings:** Barnase insert (Flexi® system) decreases the number of background colonies, allowing efficient transfer of genetic constructs.

Storage Conditions: Store vectors at –20°C.



FluoroTect™ Green$_{Lys}$ in vitro Translation Labeling System

Product	Size	Cat.#
FluoroTect™ Green$_{Lys}$ in vitro Translation Labeling System	40 reactions	L5001

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The FluoroTect™ Green$_{Lys}$ in vitro Translation Labeling System allows the fluorescent labeling and detection of proteins synthesized in vitro. The system is based on a lysine-charged tRNA that is labeled at the ε position of the lysine with the fluorophore BODIPY®-FL. Fluorescent lysine residues will be incorporated into synthesized proteins during in vitro translation reactions, eliminating the need for radioactivity.

Detection of the labeled proteins is accomplished in 2–5 minutes directly "in-gel" by use of a laser-based fluorescent gel scanner. This eliminates any requirements for protein gel manipulation such as fixing/drying or any safety, regulatory and waste disposal issues associated with the use of radioactively labeled amino acids use. The convenience of "in-gel" detection also avoids the time-consuming electroblotting and detection steps of conventional non-isotopic systems.

Features:

- **Fast:** Data can be obtained in minutes, eliminating overnight exposures associated with radioactive-based systems or time-consuming steps utilized by traditional non-isotopic methodologies.
- **Convenient:** Results based on "in-gel" detection. No requirement to transfer, fix, or dry gels.
- **Non-Radioactive:** No safety, regulatory or waste disposal issues associated with radioactivity.
- **Flexible:** The modified charged tRNA can be used with a variety of Promega translation systems including: Rabbit Reticulocyte Lysate, TNT® Coupled Transcription/Translation System, Wheat Germ Extract and *E. coli* S30 Extract.

Storage Conditions: Store at –70°C.

Transcend™ Non-Radioactive Translation Detection Systems

Product	Size	Cat.#
Transcend™ Colorimetric Translation Detection System	30 reactions	L5070
Transcend™ Chemiluminescent Translation Detection System	30 reactions	L5080
Available Separately		
Transcend™ tRNA	30 µl	L5061

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Transcend™ Non-Radioactive Translation Detection Systems allow non-radioactive detection of proteins synthesized in vitro. Using these systems, biotinylated lysine residues are incorporated into nascent proteins during translation, eliminating the need for labeling with [^{35}S]methionine or other radioactive amino acids. This biotinylated lysine is added to the translation reaction as a precharged ε-labeled biotinylated lysine-tRNA complex (Transcend™ tRNA) rather than a free amino acid. After SDS-PAGE and electroblotting, the biotinylated proteins can be visualized by binding either Streptavidin-Alkaline Phosphatase (Streptavidin-AP) or Streptavidin-Horseradish Peroxidase (Streptavidin-HRP), followed either by colorimetric or chemiluminescent detection. Typically, these methods can detect 0.5–5ng of protein within 3–4 hours after gel electrophoresis. This sensitivity is equivalent to that achieved with [^{35}S]methionine incorporation and autoradiographic detection 6–12 hours after gel electrophoresis.

Features:

- **Sensitive:** The biotin tag allows detection of 0.5–5ng of translated protein.
- **Safe:** No radioisotope handling, storage or disposal is required.
- **Fast:** Labeled proteins can be detected 3–4 hours after gel electrophoresis.
- **Flexible:** Results can be visualized by using colorimetric or chemiluminescent detection.

Storage Conditions: Store Transcend™ tRNA at –70°C. Do not subject the Transcend™ tRNA to more than five freeze-thaw cycles. Store all other components at 4°C.

Available in the Helix® on-site stocking system

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ECL Western Blotting Substrate

Product	Size	Cat.#
ECL Western Blotting Substrate	250 ml	W1001
	500 ml	W1015

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ECL Western Blotting Substrate is a highly sensitive non-radioactive, enhanced luminol-based chemiluminescent substrate for the detection of horseradish peroxidase (HRP) conjugates on immunoblots. The ECL Western Blotting Substrate detects and visualizes the presence of picogram (pg) amounts of antigen through the use of photographic or other suitable chemiluminescent imaging methods.

Features:

- **High Sensitivity:** Detect picogram levels of protein with minimal background.
- **Save Time:** No optimization required; you can switch from other entry-level ECL substrates.

Storage Conditions: Store at 2–8°C.

TMB One Solution

Product	Size	Cat.#
TMB One Solution	100 ml	G7431

For Research Use Only. Not for Use in Diagnostic Procedures.

For additional information see page 72.

AttoPhos® AP Fluorescent Substrate System

Product	Size	Cat.#
AttoPhos® AP Fluorescent Substrate System	3 × 36 mg	S1000
AttoPhos® AP Fluorescent Substrate System Trial Size	1 × 36 mg	S1001
Available Separately		
AttoPhos® Substrate	36 mg	S1011
	100 mg	S1012
	1 g	S1013
AttoPhos® Buffer	60 ml	S1021
	240 ml	S1022

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: AttoPhos® AP Fluorescent Substrate System contains a highly sensitive fluorescent alkaline phosphatase (AP) substrate.

Features:

- **Sensitivity:** Low fluorescence signal until enzymatically acted upon, yielding detection of AP to 0.1 attomole.
- **Low Background:** Low fluorescence from interfering biological molecules.
- **Linearity:** Linear kinetics over five orders of magnitude of AP concentration.
- **Additional Features:** Excitation at 435nm, emission at 555nm and large Stokes' shift (≈120nm).

Storage Conditions: Store at 4°C.

Blocking Agents

Product	Size Conc.	Cat.#
Blot-Qualified BSA	10 g	W3841
Tween® 20	2.5 ml 100 %	W3831
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: This BSA (bovine serum albumin) has been tested and qualified for optimum performance in immunoblotting applications with alkaline phosphatase antibody conjugates. It is shown to be alkaline phosphatase-free.

Tween® 20 is a nonionic detergent used as a buffer component for immunoscreening. In addition to blocking agents such as BSA, which saturate excess sites of antibody binding on membranes, this detergent acts in solution to dissociate nonspecific interactions with an antibody probe.

Western Blue® Stabilized Substrate for Alkaline Phosphatase

Product	Size	Cat.#
Western Blue® Stabilized Substrate for Alkaline Phosphatase	100 ml	S3841
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 280.

TMB Stabilized Substrate for Horseradish Peroxidase

Product	Size	Cat.#
TMB Stabilized Substrate for Horseradish Peroxidase	200 ml	W4121
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 279.

BCIP/NBT Color Development Substrate (5-bromo-4-chloro-3-indolyl-phosphate/nitro blue tetrazolium)

Product	Size	Cat.#
BCIP/NBT Color Development Substrate	1.25/2.5 ml	S3771
For Laboratory Use.		

For additional information see page 270.

Available in the Helix® on-site stocking system

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Available in the Helix® on-site stocking system

ISOQUANT® Isoaspartate Detection Kit

Product	Size	Cat.#
ISOQUANT® Isoaspartate Detection Kit	100 assays	MA1010
Not For Medical Diagnostic Use.		

Description: The ISOQUANT® Isoaspartate Detection Kit is intended for quantitative detection of isoaspartic acid residues in proteins and peptides, which can result from the gradual, nonenzymatic deamidation of asparagine or rearrangement of aspartic acid residues during storage or handling. Because the kit does not depend on the monitoring of charge differences for detection, charge heterogeneity does not interfere with the assay. The ISOQUANT® Kit can be used on peptides or proteins such as monoclonal antibodies.

Features:

- **Great Efficiency:** Simple procedure with a test time of less than one hour. Automation possible with HPLC autosampler capability.
- **Economical:** HPLC detection eliminates cost and inconvenience of radioactive materials handling.
- **Analytical:** Quantitative results available.
- **Versatile:** Perform individual samples or batches. Small sample size makes the assay suitable for research, analytical methods, formulations and process development work.
- **Robust:** Not affected by common buffer components.
- **HPLC Detection Method:** Fits with existing equipment and expertise.
- **Sensitive:** Detects isoaspartate resulting from aspartic acid rearrangement as well as deamidation of asparagine.

Storage Conditions: Store at –20°C.

Protein Interactions

Products tagged with the Helix® icon are available for distribution through our convenient on-site stocking program in a freezer, refrigerated unit or an ambient cabinet.

For more information visit: **www.promega.com/helix**

Available in the Helix® on-site stocking system

Live-Cell Protein Interactions

NanoBiT® PPI Starter Systems

Product	Size	Cat.#
NanoBiT® PPI MCS Starter System	1 each	N2014
NanoBiT® PPI Flexi® Starter System	1 each	N2015
Available Separately	**Size**	**Cat.#**
NanoBiT® PPI Control Pair (FKBP, FRB)	1 each	N2016

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: NanoLuc® Binary Technology (NanoBiT) is a two-subunit system based on NanoLuc® luciferase that can be applied to the intracellular detection of protein:protein interactions (PPIs) in live cells. The NanoBiT® system is composed of two small subunits, Large BiT (LgBiT; 18kDa) and Small BiT (SmBiT; 11 amino acid peptide), that are expressed as fusions to target proteins of interest. The LgBiT and SmBiT subunits have been independently optimized for stability and minimal self-association. Interaction of the target proteins facilitates subunit complementation to give a bright, luminescent enzyme.

The NanoBiT® PPI Starter Systems provide the vectors required to create the LgBiT and SmBiT protein fusions, a PRKACA:PRKAR2A constitutively interacting positive control pair and a negative control vector. Starter systems also include the Nano-Glo® Live Cell Assay System, a single-addition, nonlytic detection reagent used for monitoring NanoBiT® luminescence in living cells. The reagent is prepared by diluting the Nano-Glo® Live Cell Substrate with the Nano-Glo® LCS Dilution Buffer to make the Nano-Glo® Live Cell Reagent. Both substrate and buffer solutions are optimized to provide enhanced stability and reduce autoluminescence in the presence or absence of serum, increasing the sensitivity for detection of low levels of NanoBiT® luminescence. The FKBP:FRB pair is provided separately as an inducible positive control.

Expression is driven by HSV-TK promoter, providing constitutive, low-level expression in mammalian cells. Using the NanoBiT® MCS Starter System, you can generate N- and C-terminal LgBiT and SmBiT fusions to proteins of interest using traditional cloning with a multiple cloning site (MCS). Using the NanoBiT® Flexi® Starter System, you can generate N- and C-terminal LgBiT and SmBiT fusions using the Flexi® Vector Cloning System, a directional cloning method based on two rare-cutting restriction enzymes, SgfI and PmeI, that provides a rapid, efficient and high-fidelity way to transfer protein-coding regions between Flexi® Vectors without the need to resequence. To obtain your ORF clones already in Flexi® format for simple creation of fusions, visit: **www.promega.com/findmygene**

Features:

- **Obtain Greater Sensitivity:** Bright signal and reduced background improve sensitivity, signal:background ratio and dynamic range.
- **More Accurately Model PPI Biology:** Minimize artifacts with small tags and low, natural expression levels; perform real-time kinetic analysis in live cells.
- **Precisely Measure Interaction Dynamics:** Low affinity of tags minimizes spontaneous LgBiT:SmBiT association; complementation is easily reversible allowing accurate analysis of protein association and disassociation.
- **Perform Simple Measurement:** Bright luminescent output is ideal for any luminometer with no specific filter or injector requirements.
- **Scale Your Assays:** Assays can be scaled from bench to HTS, allowing use with any plate size up to 1,536-well format; detection reagent has been optimized for benchtop stability.

Storage Conditions: Nano-Glo® LCS Dilution Buffer may be thawed and stored at room temperature. Store all other components at –30°C to –10°C.

Nano-Glo® Live Cell Assay System

Product	Size	Cat.#
Nano-Glo® Live Cell Assay System	100 assays	N2011
	1,000 assays	N2012
	10,000 assays	N2013

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Nano-Glo® Live Cell Assay System is a single-addition, nonlytic detection reagent used to measure NanoBiT® or NanoLuc® luminescence from living cells. The reagent is prepared by diluting the Nano-Glo® Live Cell Substrate with the Nano-Glo® LCS Dilution Buffer to make the Nano-Glo® Live Cell Reagent, a 5X stock that is added directly to cell culture medium. Both substrate and buffer solutions are optimized to provide enhanced stability. The Nano-Glo® Live Cell Reagent is designed to reduce autoluminescence in the presence or absence of serum, increasing the sensitivity for detection of low levels of NanoBiT® or NanoLuc® luminescence. The Nano-Glo® Live Cell Assay System can be used to monitor luminescence at a user-defined time point or continuously for up to 2 hours without compromising cell viability.

Storage Conditions: Nano-Glo® LCS Dilution Buffer may be thawed and stored at room temperature. Store all other components at –30°C to –10°C.

NanoBRET™ Bromodomain/Histone Interaction Assays

Product	Size	Cat.#
NanoBRET™ BRD4/Histone H3.3 Interaction Assay	1 each	N1830
NanoBRET™ BRD4/Histone H4 Interaction Assay	1 each	N1890
NanoBRET™ BRD9/Histone H3.3 Interaction Assay	1 each	N1840
NanoBRET™ BRD9/Histone H4 Interaction Assay	1 each	N1900
NanoBRET™ BRPF1/Histone H3.3 Interaction Assay	1 each	N1860
NanoBRET™ BRPF1/Histone H4 Interaction Assay	1 each	N1910
Available Separately		
NanoBRET™ Positive Control	2 × 20 µg	N1581
NanoBRET™ PPI Control Pair (p53, MDM2)	2 × 20 µg	N1641
NanoBRET™ Nano-Glo® Detection System	200 assays	N1661
	1,000 assays	N1662
	10,000 assays	N1663

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Description: Bromodomain (BRD)-containing proteins are critical components of nuclear protein complexes involved in the recruitment of chromatin-modifying enzymes and transcriptional regulation of acetylated chromatin. The protein:protein interaction (PPI) of the BRD-containing proteins with acetylated histones is an important method of epigenetic regulation critical for cell health and development and is of great interest for drug targeting because dysfunction in BRD modulation has been implicated as a critical event in disease formation. The NanoBRET™ Bromodomain Interaction Assays enable interaction studies of BRD-containing proteins with full-length histones in the context of natural chromatin. In addition to the full-length BRD protein, the BRD fragment alone is also included for users that may want to understand the interaction of this isolated domain.

NanoBRET™ assay technology is dependent upon energy transfer from a luminescent donor (NanoLuc® luciferase) to a fluorescent acceptor (HaloTag® NanoBRET™ 618 Ligand). NanoLuc® luciferase HaloTag® protein are fused to the target proteins of interest and fusion proteins expressed at low cellular levels, enabling monitoring and screening studies of protein interactions that reflect true cellular physiology. The NanoBRET™ assay is fully reversible, enabling studies of both induction and inhibition of protein interactions.

Features:

- **Understand Real Biology:** Measure bromodomain/histone interactions in live cells in the context of natural chromatin using full-length proteins or domains.
- **Monitor Changes:** Reversible assay technology allows you to study both induction and disruption of chromatin interactions.
- **See Improved Assay Performance:** Bright, blue-shifted donor signal and red-shifted acceptor create optimal spectral overlap, increased signal and lower background compared to conventional BRET assays.
- **Scale Your Assays:** Assays can be performed in 96- or 384-well formats with low variability and high reproducibility, ideal for screening applications.
- **Enjoy Convenience:** Fully optimized assays provide a sensitive and specific method to study chromatin modulators; proven performance on GloMax® Discover System.

Storage Conditions: Store at –20°C.

NanoBRET™ Transcriptional Protein Assays

Product	Size	Cat.#
NanoBRET™ cMyc/MAX Interaction Assay	1 each	N1870
Available Separately		
NanoBRET™ Positive Control	2 × 20 µg	N1581
NanoBRET™ PPI Control Pair (p53, MDM2)	2 × 20 µg	N1641
NanoBRET™ Nano-Glo® Detection System	200 assays	N1661
	1,000 assays	N1662
	10,000 assays	N1663

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: NanoBRET™ Transcriptional Protein Assays are sensitive, reproducible live-cell assays designed for monitoring or screening the interaction of proteins involved in transcriptional regulation. Interactions between proteins are key events in the regulation of gene expression with protein homodimers and heterodimers interacting on DNA elements to regulate transcriptional events required for a variety of cellular responses. The NanoBRET™ cMyc/MAX Interaction Assay measures the specific interaction between the human cMyc and MAX transcription factors within their natural cellular context. The cMyc/MAX heterodimer regulates transcription related to cell proliferation, differentiation and apoptosis, making it an important candidate for drug targeting.

NanoBRET™ assay technology is dependent upon energy transfer from a luminescent donor (NanoLuc® luciferase) to a fluorescent acceptor (HaloTag® NanoBRET™ 618 Ligand). NanoLuc® luciferase and HaloTag® protein are fused to the target proteins of interest and fusion proteins expressed at low cellular levels, enabling monitoring and screening studies of protein interactions that reflect true cellular physiology. The NanoBRET™ assay is fully reversible, enabling studies of both induction and inhibition of protein interactions.

Features:

- **Understand Real Biology:** Live-cell assay allows you to detect transcriptional protein interactions in real time using full-length proteins or fragments.
- **Monitor Changes:** Reversible assay technology allows you to study both induction and inhibition of protein interactions.
- **See Improved Assay Performance:** Bright, blue-shifted donor signal and red-shifted acceptor create optimal spectral overlap, increased signal and lower background compared to conventional BRET assays.
- **Scale Your Assays:** Assays can be performed in 96- or 384-well formats with low variability and high reproducibility, ideal for screening applications.
- **Enjoy Convenience:** Fully optimized assays provide a sensitive and specific method to detect interactions of transcriptional target proteins of interest; proven performance on GloMax® Discover System.

Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system

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NanoBRET™ PPI Starter Systems

Product	Size	Cat.#
NanoBRET™ PPI MCS Starter System	1 each	N1811
NanoBRET™ PPI Flexi® Starter System	1 each	N1821
Available Separately		
NanoBRET™ Positive Control	2 × 20 µg	N1581
NanoBRET™ PPI Control Pair (p53, MDM2)	2 × 20 µg	N1641
NanoBRET™ Nano-Glo® Detection System	200 assays	N1661
	1,000 assays	N1662
	10,000 assays	N1663

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: NanoBRET™ technology is an improved bioluminescence resonance energy transfer (BRET)-based technology that uses NanoLuc® luciferase as the BRET energy donor and HaloTag® protein labeled with the NanoBRET™ 618 fluorescent ligand as the energy acceptor to measure the interaction of two binding partners in live cells. NanoBRET™ Protein:Protein Interaction (PPI) Assays use NanoLuc® Luciferase and HaloTag® protein fused to target proteins of interest to enable sensitive, reproducible detection of protein interactions in the natural cellular environment. The use of full-length proteins expressed at low levels enables PPI monitoring and screening studies that reflect true cellular physiology.

For more details on using NanoBRET™ technology for protein:protein interaction studies visit: NanoBRET™ Technology for Protein Interactions.

The NanoBRET™ PPI Starter Systems provide the vectors required to create NanoLuc® Luciferase and HaloTag® protein fusions to target proteins of interest, the NanoBRET™ PPI Positive Control Pair (p53, MDM2) and the NanoBRET™ Nano-Glo® Detection System, which contains the NanoBRET™ Nano-Glo® Substrate used by NanoLuc® Luciferase to generate the donor signal and the HaloTag® NanoBRET™ 618 Ligand for the fluorescent energy acceptor.

- **MCS Starter System:** Generate N- and C-terminal NanoLuc® Luciferase and HaloTag® protein fusions to target proteins using traditional cloning with a multiple cloning site (MCS).
- **Flexi® Starter System:** Generate N- and C-terminal NanoLuc® Luciferase and HaloTag® protein fusions using the Flexi® Vector Cloning System, a directional cloning method based on two rare-cutting restriction enzymes, SgfI and PmeI, that provides a rapid, efficient and high-fidelity way to transfer protein-coding regions between Flexi® Vectors without the need to resequence. Utilize Find My Gene™ to obtain your ORF clones already in Flexi® format for simple creation of fusions.

Features:

- **Understand Real Biology:** Live-cell reagents allow you to detect protein:protein interactions in real time using full-length proteins or fragments.
- **Monitor Changes:** Reversible assay technology allows you to study both induction and inhibition of protein interactions.
- **See Improved Assay Performance:** Bright, blue-shifted donor signal and red-shifted acceptor create optimal spectral overlap, increased signal and lower background compared to conventional BRET assays.
- **Scale Your Assays:** Assays can be performed in 96- or 384-well formats with low variability and high reproducibility.
- **Enjoy Convenience:** The NanoBRET™ Nano-Glo® Starter Systems provide all of the components required to design and optimize a NanoBRET™ PPI assay for your protein interactions of choice.

Storage Conditions: Store at –30°C to –10°C.

NanoBRET™ Signaling Protein Assays

Product	Size	Cat.#
NanoBRET™ KRas/BRaf Interaction Assay	1 each	N1880
Available Separately		
NanoBRET™ Positive Control	2 × 20 µg	N1581
NanoBRET™ PPI Control Pair (p53, MDM2)	2 × 20 µg	N1641
NanoBRET™ Nano-Glo® Detection System	200 assays	N1661
	1,000 assays	N1662
	10,000 assays	N1663

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: NanoBRET™ Signaling Protein Assays are sensitive, reproducible live-cell assays designed for monitoring or screening the interaction of proteins involved in cell signaling events. Interactions between proteins are key events in normal cellular signal transduction pathways, and modulation of these interactions has been implicated in disease formation, making them important candidates for drug targeting. The NanoBRET™ KRas/BRaf Interaction Assay measures the specific interaction between mutant KRas (G12C) and BRaf human proteins in their natural cellular context. In epidermal growth factor receptor (EGFR) pathway-associated oncogenesis, mutations in KRas result in constitutive binding to BRaf even in the absence of growth factor, resulting in cell proliferation and suppressed apoptosis.

NanoBRET™ assay technology is dependent upon energy transfer from a luminescent donor (NanoLuc® luciferase) to a fluorescent acceptor (HaloTag® NanoBRET™ 618 Ligand). NanoLuc® luciferase and HaloTag® protein are fused to the target proteins of interest and fusion proteins expressed at low cellular levels, enabling monitoring and screening studies of protein interactions that reflect true cellular physiology. The NanoBRET™ assay is fully reversible, enabling studies of both induction and inhibition of protein interactions.

Features:

- **Understand Real Biology:** Live-cell assay allows you to measure signaling protein interactions in natural cellular context using full-length proteins expressed at low cellular levels.
- **Monitor Changes:** Reversible assay technology allows you to study both induction and inhibition of protein interactions.
- **See Improved Assay Performance:** Bright, blue-shifted donor signal and red-shifted acceptor create optimal spectral overlap, increased signal and lower background compared to conventional BRET assays.
- **Scale Your Assays:** Assays can be performed in 96- or 384-well formats with low variability and high reproducibility, ideal for screening applications.
- **Enjoy Convenience:** Fully optimized assays provide a sensitive and specific method to detect interactions of signaling protein targets; proven performance on GloMax® Discover System.

Storage Conditions: Store at –20°C.

NanoBRET™ Nano-Glo® Detection System

Product	Size	Cat.#
NanoBRET™ Nano-Glo® Detection System	200 assays	N1661
	1,000 assays	N1662
	10,000 assays	N1663
Available Separately		
NanoBRET™ Nano-Glo® Substrate	50 µl	N1571
	5 × 50 µl	N1572
	2 × 1.25 ml	N1573
HaloTag® NanoBRET™ 618 Ligand	20 µl	G9801

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Description: The NanoBRET™ assay is a bioluminescence resonance energy transfer (BRET)-based assay that uses NanoLuc® Luciferase as the BRET energy donor and HaloTag® protein labeled with the HaloTag® NanoBRET™ 618 fluorescent Ligand as the energy acceptor to measure the interaction of two binding partners in live cells. The NanoBRET™ Nano-Glo® Detection System provides the NanoBRET™ Nano-Glo® Substrate used by NanoLuc® Luciferase to generate the donor signal and the HaloTag® NanoBRET™ 618 Ligand for the fluorescent energy acceptor. The HaloTag® NanoBRET™ 618 Ligand is added directly to the cells during plating, and the NanoBRET™ Nano-Glo® Substrate is added to the sample just prior to measuring donor and acceptor emission.

Features:

- **Understand Real Biology:** Live-cell reagents allow you to detect protein:protein interactions in real time using full-length proteins or fragments.
- **Monitor Changes:** Reversible assay technology allows you to study both induction and inhibition of protein interactions.
- **See Improved Assay Performance:** Bright, blue-shifted donor signal and red-shifted acceptor create optimal spectral overlap, increased signal and lower background compared to conventional BRET assays.
- **Scale Your Assays:** Assays can be performed in 96- or 384-well formats with low variability and high reproducibility.
- **Enjoy Convenience:** The NanoBRET™ Nano-Glo® Detection System is compatible with a diverse set of pre-built or custom NanoBRET™ PPI Assays.

Storage Conditions: Store at –30°C to –10°C, protected from light.

Protein:DNA Interactions

HaloCHIP™ System

Product	Size	Cat.#
HaloCHIP™ System	20 reactions	G9410

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The HaloCHIP™ System is a novel method designed for the covalent capture of intracellular protein:DNA complexes without the use of antibodies and offers an efficient and robust alternative to the standard chromatin immunoprecipitation (ChIP) method. Proteins of interest are expressed in cells as HaloTag® fusion proteins, crosslinked to DNA with formaldehyde and then captured on HaloLink™ Resin, which forms a highly specific, covalent interaction with the HaloTag® portion of the fusion protein. Stringent washing removes nonspecific proteins and DNA, and heating reverses the crosslinks between the DNA and the fusion protein and releases the captured DNA fragment, which subsequently can be purified.

Features:

- **No Requirement for Antibody:** No need to make your own or purchase expensive, qualified antibodies.
- **Obtain Results Faster:** Obtain data in 24–48 hours with fewer steps to minimize potential experimental errors.
- **Improved Signal-to-Noise Ratios:** Enables detection of small changes in protein binding patterns using a minimal number of cells.

Storage Conditions: The TE Buffer (pH 8.0), Reversal Buffer and Nuclease-Free Water may be stored at room temperature. Store the HaloLink™ Resin, Mammalian Lysis Buffer and High Salt Wash Buffer at 4°C. Store the HaloCHIP™ Blocking Ligand at –20°C.

Available in the Helix® on-site stocking system

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Gel Shift Assay Systems

Product	Size	Cat.#
Gel Shift Assay Core System	100 reactions	E3050
Gel Shift Assay System	100 reactions	E3300
Available Separately		
HeLaScribe® Nuclear Extract, Gel Shift Assay Grade	3 × 40 µl	E3521
Gel Shift Binding 5X Buffer	5 × 200 µl	E3581

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Description: The gel shift or electrophoretic mobility shift assay provides a simple and rapid method for detecting DNA-binding proteins. This method is widely used to study sequence-specific DNA-binding proteins such as transcription factors. The assay is based on the observation that complexes of protein and DNA migrate through a nondenaturing polyacrylamide gel more slowly than free DNA fragments or double-stranded oligonucleotides. The gel shift assay is performed by incubating a purified protein or a complex mixture of proteins (such as nuclear or cell extract preparations) with a ^{32}P end-labeled DNA fragment containing the putative protein binding site. The reaction products are then analyzed on a nondenaturing polyacrylamide gel. The specificity of the DNA-binding protein for the putative binding site is established by competition experiments using unlabeled DNA fragments or oligonucleotides containing a binding site for the protein of interest or other unrelated DNA sequences.

The Core System (Cat.# E3050) includes HeLa Nuclear Extract and SP1 and AP2 Consensus Oligos that can be used as positive controls and serve as a reliable system for obtaining experience with gel shift assays. In addition, the Core System contains T4 Polynucleotide Kinase and Kinase 10X Buffer for labeling oligonucleotides as well as Gel Shift Binding 5X Buffer. Cat.# E3300 contains all of the above plus consensus oligos for AP1, OCT1, CREB, NF-κB, and TFIID.

Features:

- **Positive Controls:** The Gel Shift Assay Core System includes a HeLa Nuclear Extract and consensus oligonucleotides for AP2 and SP1.
- **Versatile:** Oligonucleotides can be 5′ end-labeled and used as protein-specific probes or used as unlabeled oligonucleotides in competition assays.

Storage Conditions: Store HeLa Nuclear Extract at –70°C. Store other components at –20°C.

Pull-Down and Two-Hybrid Systems

Magne™ HaloTag® Beads

Product	Size	Cat.#
Magne™ HaloTag® Beads, 20% Slurry	1 ml	G7281
	5 ml	G7282

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Description: The Magne™ HaloTag® Beads provide a convenient method to covalently capture HaloTag® fusion proteins with magnetic particles for protein pull-downs and purification. These magnetic beads offer a high binding capacity (≥20mg/ml) for purified HaloTag® fusion proteins with low nonspecific protein binding. The magnetic handling properties allow streamlined protein purification and eliminate the need for multiple centrifugation steps, facilitating automated applications on robotic platforms.

The Magne™ HaloTag® Beads (Cat.# G7281 and G7282) are the recommended replacement for the discontinued HaloLink™ Magnetic Beads (Cat.# G9311).

Features:

- **Maximize Recovery of HaloTag® Fusion Proteins:** Binding capacity ≥20mg of purified HaloTag® fusion protein per milliliter of settled particles.
- **Experience Superior Magnetic Handling for High-Throughput Applications:** Magnetic particles encapsulated with macroporous cellulose.

Storage Conditions: Store at 2–10°C.

MagneGST™ Pull-Down System

Product	Size	Cat.#
MagneGST™ Pull-Down System	80 reactions	V8870

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The MagneGST™ Pull-Down System is designed for detection of protein interactions between GST-fusion proteins expressed in bacterial lysates and prey proteins expressed in the TNT® Systems. Prey protein synthesized in the TNT® Quick Coupled Transcription/Translation Reaction is captured using bait protein (GST-fusion protein) immobilized on MagneGST™ Particles. Nonspecifically bound proteins are then washed away, and the prey protein is analyzed. Prey proteins can be detected by incorporating radioactively labeled methionine in the TNT® Quick reaction, followed by SDS-PAGE and autoradiography or by incorporating the supplied non-radioactive methionine in the TNT® reaction and detecting by Western blotting with protein-specific antibodies.

Storage Conditions: Store the TNT® T7 Quick Master Mix and Methionine at –70°C. Store the RQ1 RNase-Free DNase at –20°C. Store the Nuclease-Free Water, MagneGST™ Glutathione Particles, MagneGST™ Binding/Wash Buffer and Cell Lysis Reagent at 4°C.

HaloTag® Mammalian Pull-Down Systems

Product	Size	Cat.#
HaloTag® Complete Pull-Down System	1 each	G6509
HaloTag® Mammalian Pull-Down and Labeling System	24 reactions	G6500
HaloTag® Mammalian Pull-Down System	24 reactions	G6504
HaloTag® Control Vector	20 µg	G6591
Available Separately		
Protease Inhibitor Cocktail, 50X	1 ml	G6521
Mammalian Lysis Buffer	40 ml	G9381

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The HaloTag® Mammalian Pull-Down Systems (Cat.# G6500, G6504 and G6509) are designed to capture and purify intracellular binary and higher order protein complexes, including transient or weakly interacting partners.

HaloTag® Mammalian Pull-Down System (Cat.# G6504) includes buffers and resin necessary to perform a HaloTag® pull-down.

HaloTag® Mammalian Pull-Down and Labeling System (Cat.# G6500) includes everything in G6504 *plus* the HaloTag® TMRDirect™ Ligand, which allows correlative cellular localization and real-time imaging studies.

HaloTag® Complete Pull-Down System (Cat.# G6509) includes everything in G6500 *plus* a starter cloning system, Wizard® SV Gel and PCR Clean-Up System, and FuGENE® HD Transfection Reagent.

The **HaloTag® Control Vector** provides protein expression of the HaloTag® protein in mammalian cells, *E. coli* or in vitro expression systems dependent on human cytomegalovirus (CMV) intermediate early enhancer, T7 or SP6 RNA polymerase promoters. It can be used as a control for any HaloTag® experimental system and can be used for both stable and transient HaloTag® expression in mammalian cells; for stable expression, co-transfection with a vector containing a selectable marker is required.

The **Protease Inhibitor Cocktail, 50X**, is a mixture of six different protease inhibitors with different target protease specificities. This product is provided in a freeze-dried format and can be reconstituted using either 100% ethanol or DMSO.

The **Mammalian Lysis Buffer** is designed for use with HaloTag® Mammalian-based expression systems such as the HaloTag® Mammalian Pull-Down and Labeling Systems (referenced here) as well as the HaloCHIP™ System (Cat.# G9410). Formulation consists of 50mM Tris-HCl, 150mM NaCl, 1% Triton® X-100 and 0.1% sodium deoxycholate (pH 7.5).

Related Services: Mass Spec Services.

Features:

- **Rapid, Efficient and Covalent Capture of Binary and Higher Order Complexes Directly from Lysates:** Improved capture of protein partners, including transient interactions.
- **High Purity and Low Background:** Improved accuracy in identification of proteins; covalent attachment allows bait protein to remain behind if desired.
- **Ability to Fluorescently Label the Same Genetic Fusion:** Correlate complex capture with cellular localization.
- **Compatibility with All Downstream Methods of Analysis:** Freedom to identify complexes in variety of applications including mass spectrometry.

Storage Conditions: Store the 10X TBS Buffer and SDS Elution Buffer at room temperature. Store the HaloLink™ Resin and Mammalian Lysis Buffer at 4°C. Store the HaloTag® TMRDirect™ Ligand and powdered Protease Inhibitor Cocktail at –30 to –10°C. Reconstituted Protease Inhibitor Cocktail can be stored at 2–10°C for 12 months.

HaloLink™ Resin

Product	Size	Cat.#
HaloLink™ Resin	1.25 ml	G1912
	2.5 ml	G1913
	10 ml	G1914
	25 ml	G1915

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The HaloLink™ Resin provides a method for covalent and oriented attachment of HaloTag® fusion proteins onto a solid surface. The resin consists of a HaloTag® ligand bound to Sepharose® beads that specifically and rapidly binds HaloTag® fusion proteins. HaloLink™ Resin has high binding capacity. Due to covalent linkage, HaloTag® fusion proteins cannot be eluted from the resin, allowing extensive washing to remove nonspecifically bound protein without the danger of eluting HaloTag® fusion proteins. The binding rate is very rapid and equivalent to biotin-streptavidin.

The HaloLink™ Resin can be used in a variety of applications including: detection and analysis of protein:protein interactions (in vivo and in vitro), detection of enzymatic activity of immobilized HaloTag® fusions and one-step purification of fusion protein in conjunction with proteolytic cleavage. A variety of vectors for the expression of HaloTag® fusion proteins in bacterial, mammalian or cell-free systems are available. Please see the HaloTag® Technology Products page for more information.

The HaloTag® technology offers a quick and convenient way to test protein expression of HaloTag® fusion proteins as well as monitor the efficiency of immobilization to HaloLink™ Resin by labeling with fluorescent HaloTag® TMR Ligand followed by SDS-PAGE analysis. Guidelines can be found in the *HaloLink™ Resin Technical Manual* #TM250.

Features:

- **Covalent Attachment:** Enables stringent washing, minimizing nonspecific background without dissociation of bound HaloTag® fusion proteins.
- **Fast Binding Kinetics:** Enhances the detection of protein:protein interactions and enables binding of proteins at low concentrations.
- **Oriented Immobilization:** Allows maximal enzyme activity of bound protein.
- **High Binding Capacity:** One milliliter of settled resin binds >7mg of HaloTag® fusion proteins.

Storage Conditions: Store at 4°C.

Available in the Helix® on-site stocking system

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CheckMate™ Mammalian Two-Hybrid System

Product	Size	Cat.#
CheckMate™ Mammalian Two-Hybrid System	1 system	E2440
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Two-hybrid systems are extremely powerful methods for detecting protein:protein interactions in vivo. The basis of two-hybrid systems is the modular domains found in some transcription factors: a DNA-binding domain, which binds to a specific DNA sequence, and a transcriptional activation domain, which interacts with the basal transcriptional machinery. A transcriptional activation domain in association with a DNA-binding domain will promote the assembly of RNA polymerase II complexes at the TATA box and increase transcription. In the CheckMate™ Mammalian Two-Hybrid System the DNA-binding domain and the transcriptional activation domain, produced by separate plasmids, are closely associated when one protein ("X") fused to a DNA-binding domain interacts with a second protein ("Y") fused to a transcriptional activation domain. In this system, interaction between proteins X and Y results in transcription of a reporter gene.

Features:

- **Mammalian System:** Interactions can be studied in the cell line of choice. Proteins are more likely to be in their native conformation. Post-translational modifications, such as glycosylation, phosphorylation and acylation, are better maintained.
- **Convenient Quantitation:** The Dual-Luciferase® Reporter Assay System is used for detection.
- **Internal Control:** *Renilla* luciferase normalizes transfection efficiency.
- **Fast Transient Assay:** Results obtained two days after transfection, as compared to 3–4 days with the yeast system.
- **Stable Transfectants:** The pACT Vector contains the neomycin phosphotransferase gene, which allows selection of stable transfectants.

Storage Conditions: Store at –20°C.

CheckMate™/Flexi® Vector Mammalian Two-Hybrid System

Product	Size	Cat.#
CheckMate™/Flexi® Vector Mammalian Two-Hybrid System	1 each	C9360
Available Separately		
pFN10A (ACT) Flexi® Vector	20 µg	C9331
pFN11A (BIND) Flexi® Vector	20 µg	C9341
pGL4.31[*luc2P/GAL4*UAS/Hygro] Vector	20 µg	C9351
CheckMate™ Positive Control Vectors	1 set	C9370
CheckMate™ Negative Control Vectors	1 set	C9380
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The CheckMate™/Flexi® Vector Mammalian Two-Hybrid System provides a means to confirm, validate and study suspected interactions between two proteins or domains and can also be used to generate stable cell lines for cell-based assays. Developed primarily for mammalian proteins of interest, the system can allow protein expression and post-translational modifications in an environment mimicking the native cell milieu. It is patterned on the yeast two-hybrid system with one protein of interest ("X") fused to a DNA-binding domain and the other protein ("Y") fused to a transcriptional activation domain.

The system relies upon three plasmids that are co-transfected into mammalian cells, each plasmid having unique features. The pFN10A (ACT) Flexi® Vector contains a herpes simplex virus VP16 transcriptional activation domain upstream of the cloning site, and the pFN11A (BIND) Flexi® Vector contains the yeast GAL4DNA-binding domain upstream of the cloning site. The pFN11A (BIND) Flexi® Vector also expresses the *Renilla reniformis* luciferase under the control of the SV40 promoter, allowing normalization for differences in transfection efficiency. The third vector, pGL4.31[*luc2P/GAL4*UAS/Hygro] Vector, contains five GAL4 binding sites upstream of a minimal TATA box, which is upstream of a firefly luciferase gene that acts as a reporter for interactions between proteins X and Y.

This system differs from the original CheckMate™ Mammalian Two-Hybrid System in that the vectors are compatible with the Flexi® Vector System, which allows directional cloning and rapid, efficient and high-fidelity transfer of protein coding regions between a variety of Flexi® Vectors.

Features:

- **Mammalian-Based System:** Interactions can be studied in the cell line of choice. Proteins are more likely to be in their native conformation. Post-translational modifications, such as glycosylation, phosphorylation and acylation, are better maintained.
- **Versatile:** Vectors are based on the Flexi® Cloning technology, enabling convenient transfer of protein-coding regions for additional functional proteomics applications.
- **Convenient:** The Dual-Luciferase® Reporter Assay System is used for detection.

Storage Conditions: Store at –20°C.

Protease Inhibitor Cocktail

Product	Size	Cat.#
Protease Inhibitor Cocktail, 50X	1 ml	G6521
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Protease Inhibitor Cocktail is used to prevent protein degradation after lysing cells. The product is a mixture of six different protease inhibitors with different target protease specificities. The inhibitor cocktail is EDTA-free and provided as a powder, ready for reconstitution in 1ml of either 100% ethanol or DMSO to obtain a 50X working solution.

Features:

- **Broad Specificity:** Inhibitor cocktail is effective against a diverse number of proteases.
- **Great Potency:** Reagent provides the best-in-class level of protease inhibition.
- **Highly Compatible:** Works with a wide array of protein fusion tags (e.g., Flag®, His tag, GST tag) and capture technologies. It is ideally suited for HaloTag® Technology-based approaches.

Storage Conditions: Store powdered Protease Inhibitor Cocktail at –30 to –10°C. Reconstituted Protease Inhibitor Cocktail can be stored at 2–10°C for 12 months.

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Sensitive enough to operate beyond the limits of other protein tags. Bright enough to detect and quantify proteins at endogenous levels. *The HiBiT Protein Tagging System* allows direct detection of protein abundance in cells or at the cell surface with a simple bioluminescent signal—no antibodies and no overexpression required.

Glo where none have glowed before:
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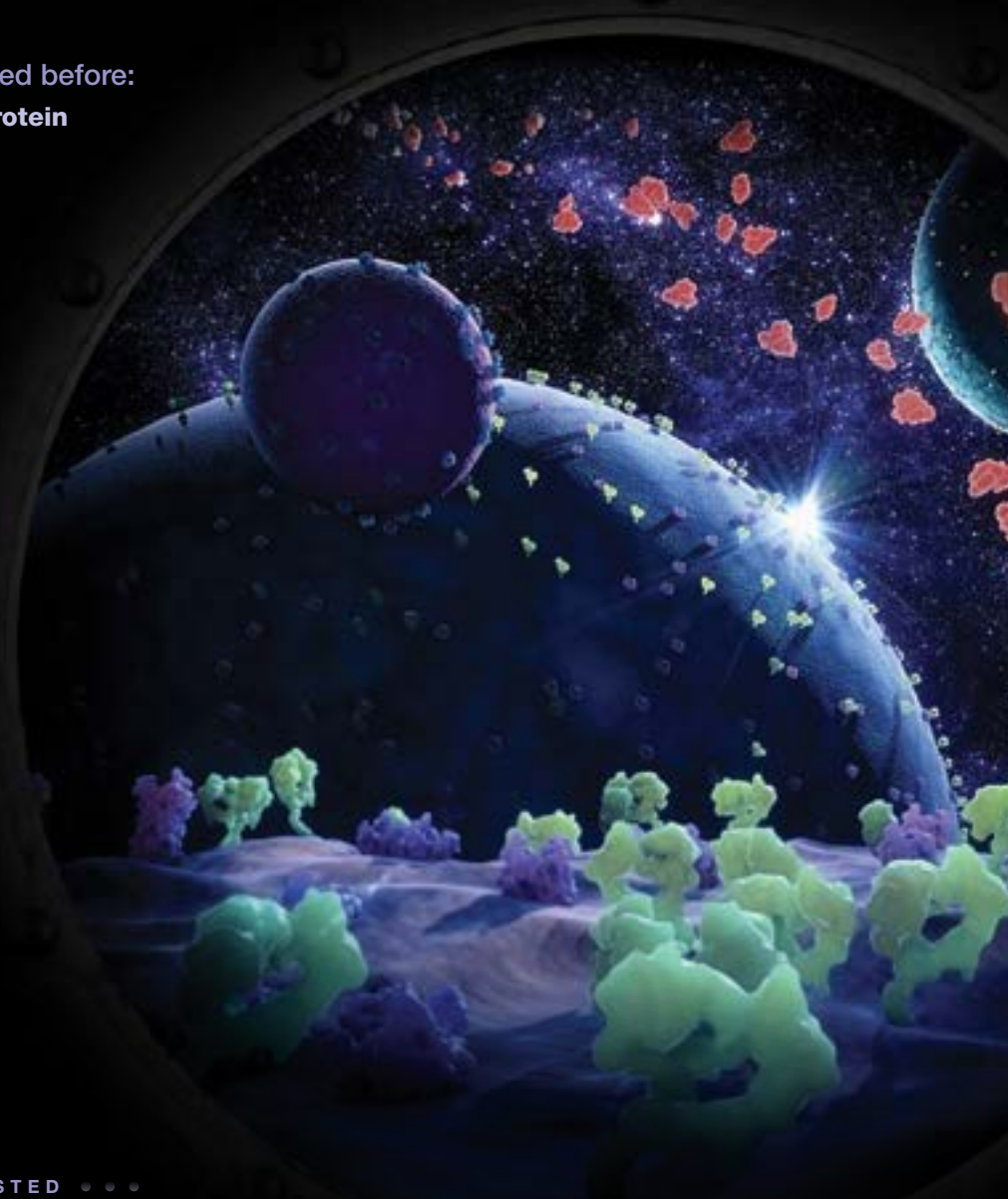

PERFORMANCE TESTED

- CRISPR Knock-Ins
- GPCR Trafficking
- Protein Degradation

Protein Purification

Products tagged with the Helix® icon are available for distribution through our convenient on-site stocking program in a freezer, refrigerated unit or an ambient cabinet.

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Available in the Helix® on-site stocking system

Antibody Purification

High Capacity Magne® Streptavidin Beads and Goat Anti-Human Biotinylated IgG

Product	Size	Cat.#
High Capacity Magne® Streptavidin Beads	3 ml	V7820
Goat Anti-Human Biotinylated IgG	4 ml	V7830

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: High Capacity Magne® Streptavidin Beads are magnetic affinity beads with high specificity and high capacity for binding biotinylated antibodies and proteins. The magnetic beads are composed of iron encapsulated by macroporous cellulose, resulting in low nonspecific binding and making them ideal for use with complex biological samples. The beads also have excellent magnetic properties for rapid and efficient capture using a variety of magnetic stands.

The affinity of biotin for streptavidin ($K_d = 10^{-15}$) is one of the strongest and most stable interactions in biology; hence, the biotin-streptavidin interaction cannot be reversed under non-denaturing conditions. Therefore, we do not recommend the use of beads for applications in which the biotinylated molecules need to be recovered from the beads.

High Capacity Magne® Streptavidin Beads are well suited for pharmacokinetics studies of therapeutic antibodies during preclinical studies. For example, biotinylated anti-human IgG bound to the High Capacity Magne® Streptavidin Beads can be used for enrichment of Human IgG from serum or plasma samples of non-primate animals and analyzed using mass spectrometry. The high capacity of the beads enables enrichment of antibodies over a wide concentration range using small amount of beads. Enrichment can be automated for high throughput and scaled up to handle various sample volumes.

Goat Anti-Human Biotinylated IgG is provided at a concentration of 0.5mg/ml in phosphate-buffered saline (pH 7.4) with 0.1% sodium azide.

Features:

- **Improve Your Results:** High binding capacity and low non-specific binding.
- **Use in High-Throughput Formats with Robotics:** Rapid magnetic response.
- **Characterize Large Dynamic Range:** High binding capacity.

Storage Conditions: Store at 4°C. Do not freeze the solution or let it dry during storage or use.

Magne™ Protein G and Magne™ Protein A Beads

Product	Size	Cat.#
Magne™ Protein G Beads, 20% Slurry	1 ml	G7471
	5 ml	G7472
	50 ml	G7473
Magne™ Protein A Beads, 20% Slurry	1 ml	G8781
	5 ml	G8782
	50 ml	G8783

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Magne™ Protein G and Magne™ Protein A Beads are magnetic affinity beads with high specificity and high capacity for purification of immunoglobulins from cell culture media, ascites and serum samples. These paramagnetic beads are composed of iron encapsulated in macroporous cellulose with low nonspecific binding. The magnetic beads use a novel attachment chemistry to immobilize recombinant Protein G or Protein A protein molecules in the same orientation on the surface of the bead. The oriented attachment is known to improve the functionality of immobilized proteins. These beads offer a convenient method for achieving high purity and high recovery of monoclonal and polyclonal antibodies from a variety of biological samples. The superb magnetic properties of Magne™ Protein G and Magne™ Protein A Beads allow rapid and efficient capture of antibodies either with manually processed samples or in a high-throughput manner using the Promega ReliaPrep™ LV 32 HSM Instrument or a robotic platform such as the Beckman Coulter Biomek® FX.

Features:

- **High Capacity:** Binding capacities in excess of 25mg per milliliter of settled beads are observed depending on antibody species and isotype.
- **Ease of Handling:** Minimize losses during purification and increase sample throughput due to exceptional magnetic properties.
- **High Purity:** Ensure high-quality purification because of low nonspecific binding on beads.
- **Optimized Performance:** Use validated antibody purification methods for small (20µl) to medium (50ml) sample volumes.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at 4°C. Do not freeze. Do not allow beads to dry during storage or use.

Protein Purification Kits

HaloTag® Protein Purification System

Product	Size	Cat.#
HaloTag® Protein Purification System	1 each	G6280
HaloTag® Protein Purification System Sample Pack	1 each	G6270

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The HaloTag® Protein Purification System is designed to purify proteins fused to the HaloTag® protein tag that enhances the expression and solubility of recombinant proteins. HaloTag® Technology enables the covalent, efficient and specific capture of a protein of interest onto HaloLink™ Resin, thus overcoming the equilibrium-based limitations associated with affinity tags (i.e., poor capture of proteins expressed at low levels and protein loss during washing of the purification resin).

HaloTag® technology offers a quick and convenient way to test expression of HaloTag® fusion proteins as well as monitor the efficiency of immobilization to HaloLink™ Resin by labeling with fluorescent HaloTag® TMR Ligand followed by SDS-PAGE analysis. Guidelines can be found in the *HaloLink™ Resin Technical Manual* #TM250, the *HaloLink™ Protein Array Technical Manual* #TM310 and the *HaloCHIP™ System Technical Manual* #TM075.

Outline of Procedure

The HaloTag® protein, a 34kDa mutated hydrolase, covalently attaches to HaloLink™ Resin via an immobilized chloroalkane ligand. TEV Protease cleaves the target protein from the HaloLink™ Resin. The TEV Protease, which has an N-terminal (HQ) tag, is removed from the protein of interest using HisLink™ Resin, and the purified protein of interest is recovered. The appropriate vector that encodes the HaloTag® protein and expresses protein optimally in *E. coli* is pFN18A HaloTag® T7 Flexi® Vector (G2751) or pFN18K HaloTag® T7 Flexi® Vector (G2681). These vectors can be purchased separately.

Features:

- **Experience Superior Yield, Purity and Specific Activity of Soluble, Functional Proteins Compared to His-Tag, GST and MBP Affinity Tags:** Specific and covalent HaloTag® fusion protein capture and immobilization on HaloLink™ Resin.
- **Achieve Enhanced Target Protein Expression in Prokaryotic, Mammalian and Cell-Free Systems:** Proteins are expressed as HaloTag® fusion proteins.
- **Purify Poorly Expressed Fusion Proteins:** Rapid, specific and covalent capture of HaloTag® protein onto HaloLink™ Resin is a nonequilibrium process.
- **Efficiently Recover Tag-Free Target Protein using TEV Protease Cleavage:** Optimized TEV protease recognition site within the interconnecting polypeptide separating the HaloTag® protein and the fusion partner. HaloTag® protein remains immobilized on the resin due to covalent capture.
- **Save Time:** One buffer compatible with downstream applications for all purification steps.
- **Perform Easy In-Gel Detection and Quantification of Protein Expression Levels with Fluorescent HaloTag® Ligands:** Highly stable HaloTag® protein-ligand interaction permits boiling with SDS sample buffer followed by resolving on SDS-PAGE.

Storage Conditions: Store the HaloLink™ Resin and HisLink™ Resin at 4°C. Do not freeze the resins. Store the TEV Protease at –20°C.

HaloTag® Mammalian Protein Purification System

Product	Size	Conc.	Cat.#
HaloTag® Mammalian Protein Detection and Purification System	1 each		G6795
HaloTag® Mammalian Protein Purification System	1 each		G6790
HaloTag® Mammalian Protein Detection and Purification System Sample Pack	1 each		G6799
Available Separately	**Size**	**Conc.**	**Cat.#**
HaloTEV Protease	200 µl	5 u/µl	G6601
	800 µl	5 u/µl	G6602
HaloTag® TMRDirect™ Ligand	30 µl	0.1 mM	G2991
Protease Inhibitor Cocktail, 50X	1 ml		G6521

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The HaloTag® Mammalian Protein Purification System (Cat.# G6790) is an optimized kit for purification of HaloTag® fusion proteins from mammalian cell culture lysates. HaloTag® fusion proteins form a highly specific and covalent bond with the HaloLink™ Resin. The covalent binding coupled with the low nonspecific binding of the HaloLink™ Resin provides superior purity and recovery of recombinant proteins from cultured mammalian cells, even at low expression levels. The HaloTag® Mammalian Protein Detection and Purification System (Cat.# G6795) also includes HaloTag® TMRDirect™ Ligand. The simple-to-use fluorescent detection of the HaloTag® fusion facilitates rapid optimization of expression and purification conditions.

Features:

- **Purify More Protein:** HaloLink™ Resin covalently binds >7mg/ml of HaloTag® fusion protein (10X more capacity compared to FLAG®). Recovery is highly efficient, commonly >75%.
- **Higher Purity:** Covalent capture allows extensive and/or stringent washes without loss of bound protein, resulting in very low (<0.1%) nonspecific binding and a highly pure protein.
- **Easily Scalable:** Scale up and down, important for obtaining mg-plus quantities.
- **Optimized for Mammalian Protein Expression:** The HaloTag® platform allows flexibility to move between purification, pull-downs and cellular imaging with a single construct.

Storage Conditions: Store Spin Columns at room temperature. Store HaloLink™ Resin at 4°C. Store HaloTEV Protease below –65°C. Store HaloTag® TMRDirect™ Ligand and powdered Protease Inhibitor Cocktail at –30 to –10°C. Reconstituted Protease Inhibitor Cocktail can be stored at 2–10°C for 12 months.

Available in the Helix® on-site stocking system

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Magne™ HaloTag® Beads

Product	Size	Cat.#
Magne™ HaloTag® Beads, 20% Slurry	1 ml	G7281
	5 ml	G7282

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Magne™ HaloTag® Beads provide a convenient method to covalently capture HaloTag® fusion proteins with magnetic particles for protein pull-downs and purification. These magnetic beads offer a high binding capacity (≥20mg/ml) for purified HaloTag® fusion proteins with low nonspecific protein binding. The magnetic handling properties allow streamlined protein purification and eliminate the need for multiple centrifugation steps, facilitating automated applications on robotic platforms.

The Magne™ HaloTag® Beads (Cat.# G7281 and G7282) are the recommended replacement for the discontinued HaloLink™ Magnetic Beads (Cat.# G9311).

Features:

- **Maximize Recovery of HaloTag® Fusion Proteins:** Binding capacity ≥20mg of purified HaloTag® fusion protein per milliliter of settled particles.
- **Experience Superior Magnetic Handling for High-Throughput Applications:** Magnetic particles encapsulated with macroporous cellulose.

Storage Conditions: Store at 2–10°C.

HaloTag® Standard Protein

Product	Size	Cat.#
HaloTag® Standard Protein	30µg	G4491

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The HaloTag® Standard Protein is a 61kDa purified HaloTag®-GST fusion protein supplied at a concentration of 3.0mg/ml. HaloTag® Standard Protein can be used to estimate the expression level of your HaloTag® fusion protein.

Features:

- 61kDa purified HaloTag®-GST fusion protein
- Supplied at a concentration of 3.0mg/ml
- Estimate the expression level of your HaloTag® fusion protein

Storage Conditions: Store at –20°C.

Magne™ Protein G and Magne™ Protein A Beads

Product	Size	Cat.#
Magne™ Protein G Beads, 20% Slurry	1 ml	G7471
	5 ml	G7472
	50 ml	G7473
Magne™ Protein A Beads, 20% Slurry	1 ml	G8781
	5 ml	G8782
	50 ml	G8783

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Magne™ Protein G and Magne™ Protein A Beads are magnetic affinity beads with high specificity and high capacity for purification of immunoglobulins from cell culture media, ascites and serum samples. These paramagnetic beads are composed of iron encapsulated in macroporous cellulose with low nonspecific binding. The magnetic beads use a novel attachment chemistry to immobilize recombinant Protein G or Protein A protein molecules in the same orientation on the surface of the bead. The oriented attachment is known to improve the functionality of immobilized proteins. These beads offer a convenient method for achieving high purity and high recovery of monoclonal and polyclonal antibodies from a variety of biological samples. The superb magnetic properties of Magne™ Protein G and Magne™ Protein A Beads allow rapid and efficient capture of antibodies either with manually processed samples or in a high-throughput manner using the Promega ReliaPrep™ LV 32 HSM Instrument or a robotic platform such as the Beckman Coulter Biomek® FX.

Features:

- **High Capacity:** Binding capacities in excess of 25mg per milliliter of settled beads are observed depending on antibody species and isotype.
- **Ease of Handling:** Minimize losses during purification and increase sample throughput due to exceptional magnetic properties.
- **High Purity:** Ensure high-quality purification because of low nonspecific binding on beads.
- **Optimized Performance:** Use validated antibody purification methods for small (20µl) to medium (50ml) sample volumes.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at 4°C. Do not freeze. Do not allow beads to dry during storage or use.

MagneGST™ Pull-Down System

Product	Size	Cat.#
MagneGST™ Pull-Down System	80 reactions	V8870

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The MagneGST™ Pull-Down System is designed for detection of protein interactions between GST-fusion proteins expressed in bacterial lysates and prey proteins expressed in the TnT® Systems. Prey protein synthesized in the TnT® Quick Coupled Transcription/Translation Reaction is captured using bait protein (GST-fusion protein) immobilized on MagneGST™ Particles. Nonspecifically bound proteins are then washed away, and the prey protein is analyzed. Prey proteins can be detected by incorporating radioactively labeled methionine in the TnT® Quick reaction, followed by SDS-PAGE and autoradiography or by incorporating the supplied non-radioactive methionine in the TnT® reaction and detecting by Western blotting with protein-specific antibodies.

Storage Conditions: Store the TnT® T7 Quick Master Mix and Methionine at –70°C. Store the RQ1 RNase-Free DNase at –20°C. Store the Nuclease-Free Water, MagneGST™ Glutathione Particles, MagneGST™ Binding/Wash Buffer and Cell Lysis Reagent at 4°C.

HaloTEV Protease

Product	Size	Conc.	Cat.#
HaloTEV Protease	200 µl	5 u/µl	G6601
	800 µl	5 u/µl	G6602

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: HaloTEV Protease (81kDa) is a fusion between the HaloTag® protein and TEV protease, a highly specific proteolytic enzyme that cleaves at a specific TEV site, a specific seven-amino-acid sequence (ENLYFQ(G/S)). HaloTEV Protease allows covalent immobilization on HaloLink™ Resin and removal from a cleavage reaction in a single-step purification. The covalent capture of HaloTEV Protease improves purity of the final target protein and assures the improved recovery of the TEV protease.

Features:

- **Improve Final Protein Purity:** Covalently remove HaloTEV from your purified protein with HaloLink™ Resin.
- **Optimized for HaloTag® Purifications:** Proteins can be purified tag-free in a single step as the HaloLink™ Resin will bind both HaloTag® protein tag and the HaloTEV protease.

Storage Conditions: Store below –65°C.

Streptavidin

Product	Size	Cat.#
Streptavidin	1 mg	Z7041

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Promega Streptavidin is purified by affinity chromatography and is of the highest quality available.

Storage Conditions: Store at –20°C.

Streptavidin Alkaline Phosphatase

Product	Size	Cat.#
Streptavidin Alkaline Phosphatase	0.5 ml	V5591

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Streptavidin Alkaline Phosphatase is used for the detection of biotinylated molecules.

Composition: Conjugated Streptavidin Alkaline Phosphatase in PBS, 1mg/ml BSA, 1mM $MgCl_2$, 0.1mM $ZnCl_2$ and 0.02% sodium azide.

Features:

- **Quality Tested:** Streptavidin Alkaline Phosphatase is quality tested to ensure optimal performance for the detection of biotinylated molecules.

Storage Conditions: Store at 4°C. **Do not freeze!**

MagZ™ Protein Purification System

Product	Size	Cat.#
MagZ™ Protein Purification System	30 reactions	V8830

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The MagZ™ Protein Purification System provides a simple, rapid and reliable method for the purification of expressed polyhistidine- or HQ-tagged proteins, which are 99% free of hemoglobin contamination, from rabbit reticulocyte lysate. Based on the use of proprietary, paramagnetic precharged particles, polyhistidine- or HQ-tagged protein can be isolated from 50–500µl of TnT® Coupled Transcription/Translation reactions. Polyhistidine- or HQ-tagged proteins bind to the particles in minutes, while unbound proteins are washed away, and the target protein is eluted with imidazole.

Features:

- **Specific:** Minimal hemoglobin (<0.1%) binding to the MagZ™ Binding Particles.
- **Quick:** No long incubations are required.
- **Versatile:** Binding/wash and elution conditions can be further optimized for individual polyhistidine- or HQ-tagged proteins.

Storage Conditions: Store at 4°C.

Available in the Helix® on-site stocking system

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HisLink™ Protein Purification Systems

Product	Size	Cat.#
HisLink™ Spin Protein Purification System	25 reactions	V1320
HisLink™ Protein Purification Resin	5 ml	V8823
	50 ml	V8821

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: HisLink™ Protein Purification System is designed for purification of polyhistidine (His)-tagged or HQ-tagged proteins directly from culture medium containing bacterial cells expressing the tagged protein of interest. The product uses the HisLink™ Protein Purification Resin, a macroporous silica resin derivatized with a high level of tetradentate-chelated nickel (>20mmol Ni/ml settled resin). The resin performs well in either column, batch or vacuum-based methods with a binding capacity of >15mg/ml of resin. The HisLink™ Protein Purification Resin is useful in all general immobilized metal affinity chromatography (IMAC) applications matrix as well as in low- to medium-pressure liquid chromatography systems.

The bacterial cells are lysed using the FastBreak™ Cell Lysis Reagent (Cat.# V8573), and the crude lysate is combined with the HisLink™ Resin. The addition of these reagents results in simultaneous bacterial lysis and binding of the polyhistidine- or HQ-tagged proteins. The samples are transferred to user-provided columns or to included Spin Columns, where the untagged proteins are washed away and the His-tagged protein is recovered by elution with imidazole. If desired, the resin may be used in vacuum filtration devices (e.g., Vac-Man® Vacuum Manifold [Cat.# A7231]) to rapidly process simultaneous samples.

Features:

- **Save Time:** No centrifugation (pre-clearing) required; polyhistidine- or HQ-tagged proteins are purified directly from cleared or crude cell lysates.
- **Quick:** No long lysozyme incubations are required for cell lysis.
- **Flexible and Versatile:** Perform purification manually in batch, using a vacuum manifold, using liquid chromatography or liquid handling platform.

Storage Conditions: Store the system and resin at 4°C. Plates may be stored at 4°C or room temperature. Store Spin Columns, Collection Tubes and FastBreak™ Cell Lysis Reagent at room temperature. After reconstitution, store the DNase I in aliquots at –20°C.

MagneGST™ Protein Purification System

Product	Size	Cat.#
MagneGST™ Protein Purification System	40 reactions	V8600
	200 reactions	V8603
MagneGST™ Glutathione Particles	4 ml	V8611
	20 ml	V8612

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The MagneGST™ Protein Purification System provides a simple, rapid and reliable method for the purification of glutathione-S-transferase (GST) fusion proteins. Immobilized glutathione paramagnetic particles (MagneGST™ Particles) are used to isolate GST-tagged protein directly from a crude or cleared lysate using either a manual or automated procedure and requires use of a magnetic stand. GST-tagged proteins can be purified on a small scale from 1ml of culture or on a large scale using more than 50ml of culture. Samples also can be processed using a robotic platform. MagneGST™ particles are supplied as a 25% slurry and have a binding capacity of 5–10mg of GST protein per 1ml of settled resin.

Features:

- **Simple:** One-step purification of multiple samples with easy handling.
- **Quick:** After cell lysis, no requirement for high-speed centrifugation to clear lysate.
- **Scalable:** Scalable protocol using 1–50ml of cell culture.
- **Efficient:** Achieve high yields with little or no nonspecific background.

Storage Conditions: The complete system consists of two individual parts, each with a different storage condition. Store individual boxes at specified temperatures of 4°C and –70°C.

FastBreak™ Cell Lysis Reagent

Product	Size	Cat.#
FastBreak™ Cell Lysis Reagent, 10X	15 ml	V8571
	60 ml	V8572
	100 ml	V8573

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: FastBreak™ Cell Lysis Reagent is designed for the efficient, gentle lysis of *E. coli* cultures without the need for centrifugation or mechanical cell disruption. The reagent is provided as a 10X concentrate and contains a proprietary nonionic detergent to facilitate lysis. Add the reagent directly to *E. coli* cultures. Following a brief incubation, the cells are disrupted, and the protein of interest is released. Recombinant proteins can be directly screened in the cell extract or purified by the addition of the appropriate affinity matrix such as the MagneHis™ Protein Purification System. This product is suitable for both manual and automated protocols.

Features:

- **Save Time:** Eliminate centrifugation or mechanical disruption.
- **Easy to Use:** Add and incubate.
- **Flexible:** Use manually or on a robotic platform.

Storage Conditions: Store at 4–25°C.

MagneHis™ Protein Purification System

Product	Size	Cat.#
MagneHis™ Protein Purification System	65 reactions	V8500
	325 reactions	V8550
MagneHis™ Ni-Particles	2 ml	V8560
	10 ml	V8565

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The MagneHis™ Protein Purification System provides a simple, rapid and reliable method for the purification of polyhistidine- or HQ-tagged, expressed proteins. Paramagnetic precharged nickel particles (MagneHis™ Ni-Particles) are used to isolate polyhistidine- or HQ-tagged protein directly from a crude cell lysate using either a manual (requires use of a magnetic stand) or automated procedure. Using a tube format, polyhistidine- or HQ-tagged protein can be purified on a small scale using less than 1ml of culture or on a large scale using more than 1 liter of culture. Samples can be processed in a high-throughput manner using a robotic platform such as the Beckman Coulter Biomek® 2000 or FX or Tecan Genesis® RSP.

Features:

- **Simple:** No centrifugation or vacuum is required once the cells are lysed.
- **Flexible:** MagneHis™ Ni-Particles are compatible with a variety of common buffers.
- **Efficient:** Binding capacity is up to 1mg of polyhistidine-tagged protein per 1ml of MagneHis™ Ni-Particles.

Storage Conditions: Store at 4°C.

PinPoint™ Xa Protein Purification System

Product	Size	Cat.#
PinPoint™ Xa Protein Purification System	1 system	V2020

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The PinPoint™ Xa Protein Purification System is designed for the production and purification of fusion proteins that are biotinylated in vivo. The DNA coding for the protein of interest is cloned into a PinPoint™ Vector downstream of a sequence encoding a peptide that becomes biotinylated in vivo. Biotinylated fusion proteins are produced in *E. coli* and are affinity-purified using the SoftLink™ Soft Release Avidin Resin. This proprietary resin allows elution of the fusion protein under nondenaturing conditions. The PinPoint™ Vectors feature the encoded endoproteinase Factor Xa (pronounced "ten a") proteolytic site that provides a way to separate the purification tag from the native protein, and the vectors carry a convenient multiple cloning region for ease in construction of fusion proteins.

The system contains vectors in all possible sense reading frames, an avidin-conjugated resin, Streptavidin-Alkaline Phosphatase, a purification column and biotin. The PinPoint™ Xa Control Vector contains the chloramphenicol acetyltransferase (CAT) gene and is provided as a means of monitoring protein expression, purification and processing conditions. The system generally yields 1–5mg of protein per liter of culture.

Features:

- **In vivo Biotinylation Tag:** Allows purification of fusion proteins; many proteins produced have been soluble.
- **Easy to Use:** Purification of biotinylated proteins with the SoftLink™ Resin can be performed by column or batch purification.
- **Easy Detection:** Streptavidin Alkaline Phosphatase can be used to detect the biotinylated fusion protein in a pseudo-Western format to monitor purification.
- **Flexible:** PinPoint™ Vectors are supplied for all reading frames.
- **Gentle Release Conditions:** SoftLink™ Resin allows release of the fusion protein under nondenaturing conditions.
- *tac* Promoter: Allows tightly regulated expression.

Storage Conditions: Store the PinPoint™ Purification Column at room temperature. Store all remaining components at 4°C. The vectors may be stored at –20°C.

Available in the Helix® on-site stocking system

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Available in the Helix® on-site stocking system

SoftLink™ Soft Release Avidin Resin

Product	Size	Cat.#
SoftLink™ Soft Release Avidin Resin	1 ml	V2011
	5 ml	V2012

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: SoftLink™ Avidin Resin can be used for the isolation and purification of biotinylated molecules. SoftLink™ Resin is a rigid, methacrylate polymeric gel filtration matrix, functionalized with covalently bound, monomeric avidin. Monomeric avidin binds biotin with a K_d value of 10^{-7}M, allowing reversible binding of bound biotinylated proteins under mild elution conditions. Native, or tetrameric, avidin binds biotin with a very strong affinity ($K_d = 10^{-15}$M), which in turn requires strong denaturing conditions for eluting bound material. Monomeric avidin allows the specificity of capture but also the mildness of release appropriate for the purification of sensitive biological materials.

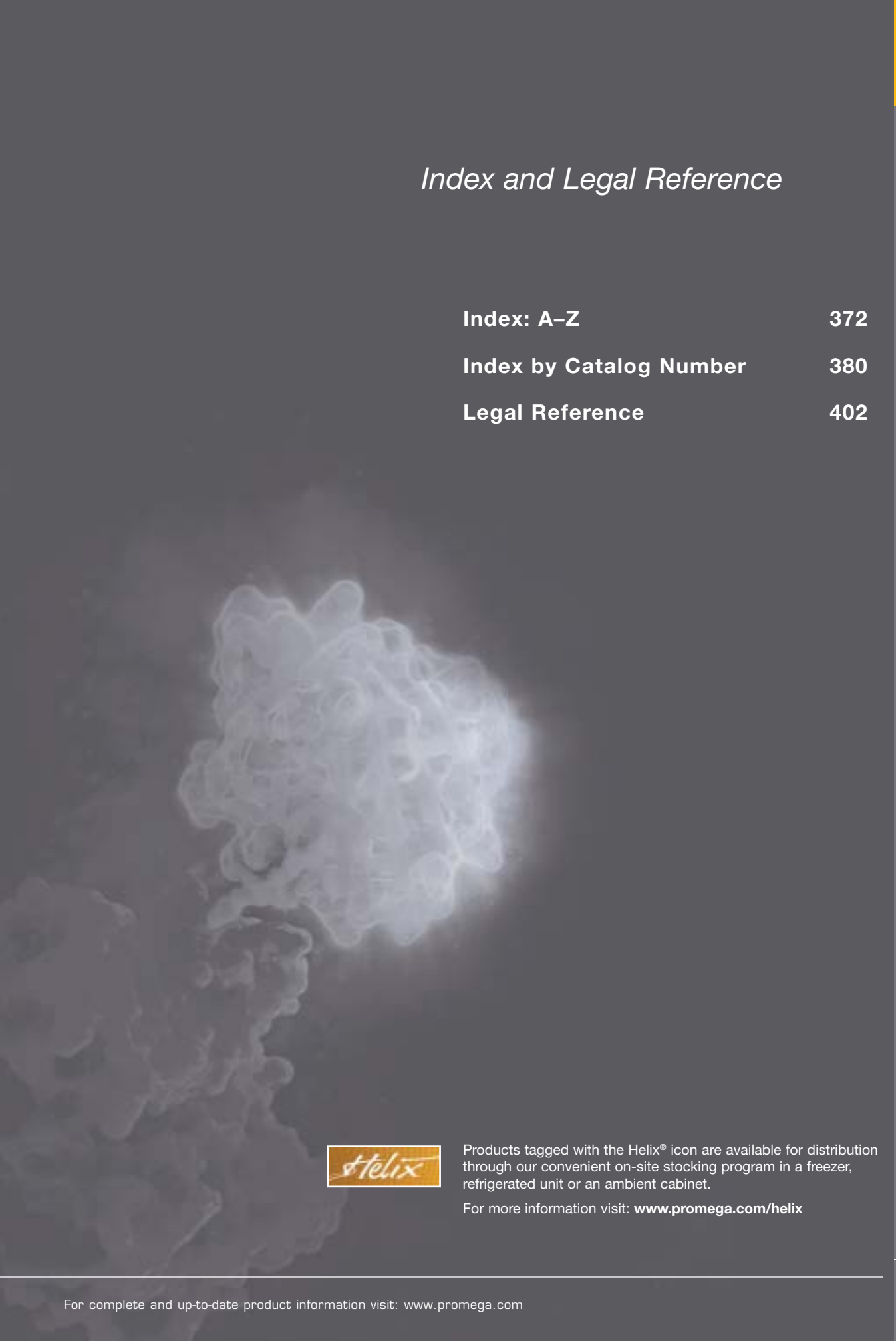
Features:

- **Sensitive:** Binds 20–40nmol of biotinylated protein per milliliter of resin.
- **Easy to Use:** Bound biotinylated molecules can be eluted under mild nondenaturing conditions (5mM biotin).
- **Versatile:** Retains biotin binding ability following exposure to a wide range of pH, low or high ionic strength, 6M guanidine and 1% SDS.
- **Reusable:** Regenerates at least 10 times without loss of binding capacity.
- **Robust:** Supports high flow rates (300cm/hour) and centrifugal forces (1,500 × *g*) in batch applications.
- **Flexible:** Purifications by batch or column method.

Storage Conditions: Store at 4°C.

Promega

27 Index and Legal Reference



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G4521	50bp DNA Step Ladder	90 µg	99
G5021	rhEGF	100 µg	53
G5071	rhFGF, Basic	25 µg	53
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G5241	rhTNFα	10 µg	53
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G5440	CellTiter 96® AQ_{ueous} Non-Radioactive Cell Proliferation Assay	50,000 assays	23
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G7360	DeadEnd™ Colorimetric TUNEL System	20 reactions	17
G7431	TMB One Solution	100 ml	72
G7451	Anti-Luciferase pAb	200 µg	70
G7461	CaspACE™ FITC-VAD-FMK In Situ Marker	50 µl	16
G7462	CaspACE™ FITC-VAD-FMK In Situ Marker	125 µl	16
G7471	Magne™ Protein G Beads, 20% Slurry	1 ml	243, 246, 364, 366
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G7531	BenchTop PCR Markers	300 µl	98
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G7572	CellTiter-Glo® Luminescent Cell Viability Assay	100 ml	20
G7573	CellTiter-Glo® Luminescent Cell Viability Assay	10 × 100 ml	20
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G7791	Apo-ONE® Homogeneous Caspase-3/7 Assay	100 ml	16
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G8092	Caspase-Glo® 3/7 Assay	100 ml	14
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G8202	Caspase-Glo® 8 Assay	100 ml	15
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G8272	HaloTag® diAcFAM Ligand	30 µl	64, 345
G8273	HaloTag® diAcFAM Ligand	15 µl	64, 345
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G8421	pFC27A HaloTag® CMV-neo Flexi® Vector	20 µg	65, 68, 347
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G8462	CellTiter-Glo® One Solution Assay	500 ml	20
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G8591	HaloTag® PEG-Biotin Ligand	30 µl	64, 345
G8592	HaloTag® PEG-Biotin Ligand	15 µl	64, 345
G8621	Proteasome-Glo™ Chymotrypsin-Like Assay	10 ml	342
G8622	Proteasome-Glo™ Chymotrypsin-Like Assay	50 ml	342
G8631	Proteasome-Glo™ Trypsin-Like Assay	10 ml	342
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G8742	CellTox™ Green Cytotoxicity Assay	50 ml	26
G8743	CellTox™ Green Cytotoxicity Assay	100 ml	26
G8760	Proteasome-Glo™ Trypsin-Like Cell-Based Assay	10 ml	343
G8761	Proteasome-Glo™ Trypsin-Like Cell-Based Assay	5 × 10 ml	343
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G9291	CytoTox-Glo™ Cytotoxicity Assay	5 × 10 ml	27
G9292	CytoTox-Glo™ Cytotoxicity Assay	2 × 50 ml	27
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G9835	pHAb Thiol Reactive Dye	4 × 250 µg	244
G9841	pHAb Amine Reactive Dye	1 × 250 µg	244
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P1181	Transcription Optimized 5X Buffer	200 µl	165
P1193	Nuclease-Free Water	50 ml	165, 275
P1195	Nuclease-Free Water	150 ml	119, 148, 151, 275
P1196	Nuclease-Free Water	150ml	134, 256
P1197	Nuclease-Free Water	500 ml	136, 200, 275
P1199	Nuclease-Free Water	1,000 ml	136, 200, 275
P1221	rATP, rCTP, rGTP, rUTP, each at 10mM in separate tubes	0.5 ml	165, 195
P1231	ViviRen™ In Vivo *Renilla* Luciferase Substrate	0.37 mg	67
P1232	ViviRen™ In Vivo *Renilla* Luciferase Substrate	3.7 mg	67
P1241	pSP64 Poly(A) Vector	20 µg	130
P1280	RiboMAX™ Large Scale RNA Production System—SP6	1 system	164
P1300	RiboMAX™ Large Scale RNA Production System—T7	1 system	164
P1320	T7 RiboMAX™ Express Large Scale RNA Production System	1 system	164
P1420	Riboprobe® System—SP6	1 system	164
P1430	Riboprobe® System—T3	1 system	164
P1440	Riboprobe® System—T7	1 system	164
P1450	Riboprobe® Combination System—T3/T7 RNA Polymerase	1 system	165
P1460	Riboprobe® Combination System—SP6/T7 RNA Polymerase	1 system	165
P1691	HaloTag® Succinimidyl Ester (O2) Ligand	5 mg	66, 346
P1700	T7 RiboMAX™ Express RNAi System	50 × 20µl reactions	168
P1711	Ribo m^7G Cap Analog	10 A_{254} units	165
P1712	Ribo m^7G Cap Analog	25 A_{254} units	165
P1781	VivoGlo™ Caspase-3/7 Substrate (Z-DEVD-Aminoluciferin, Sodium Salt)	50 mg	66
P1782	VivoGlo™ Caspase-3/7 Substrate (Z-DEVD-Aminoluciferin, Sodium Salt)	5 × 50 mg	66
P2075	T7 RNA Polymerase	1,000 u	117
P2077	T7 RNA Polymerase	5,000 u	117
P2083	T3 RNA Polymerase	1,000 u	117
P2151	pGEM®-3Z Vector	20 µg	127
P2161	pGEM®-4Z Vector	20 µg	128
P2191	pSP72 Vector	20 µg	131
P2221	pSP73 Vector	20 µg	131
P2241	pGEM®-5Zf(+) Vector	20 µg	128
P2251	pGEM®-7Zf(+) Vector	20 µg	129
P2261	pGEM®-3Zf(–) Vector	20 µg	127
P2271	pGEM®-3Zf(+) Vector	20 µg	127
P2301	Bacterial Strain NM522, Glycerol Stock	500 µl	132
P2371	pGEM®-7Zf(–) Vector	20 µg	129
P2391	pGEM®-9Zf(–) Vector	20 µg	129
P2411	pGEM®-11Zf(+) Vector	20 µg	130
P2561	pGEM® Express Positive Control Template	10 µg	165
P4024	T3 RNA Polymerase (HC)	2,500 u	117
P4074	T7 RNA Polymerase (HC)	10,000 u	117
P4084	SP6 RNA Polymerase (HC)	2,500 u	116
PS5000	PowerSeq™ Quant MS System	500 reactions	266
P6711	HaloTag® Amine (O2) Ligand	5 mg	66, 346
P6741	HaloTag® Amine (O4) Ligand	5 mg	66, 346
P6751	HaloTag® Succinimidyl Ester (O4) Ligand	5 mg	66, 346
P6771	HaloTag® Iodoacetamide (O4) Ligand	5 mg	66, 346
P9751	Bacterial Strain JM109, Glycerol Stock	500 µl	132
P9801	Bacterial Strain JM109(DE3), Glycerol Stock	500 µl	132
PQ5002	PowerQuant™ System	200 reactions	258
PQ5008	PowerQuant™ System	800 reactions	258
Q4461	pTARGET™ Sequencing Primer	2 µg	198
Q5011	SP6 Promoter Primer	2 µg	117
Q5401	pUC/M13 Primer, Reverse (17mer)	2 µg	214
Q5601	pUC/M13 Primer, Forward (24mer)	2 µg	214
Q5761	pALTER®-MAX Vector	20 µg	126, 217
Q6131	Bacterial Strain ES1301 *mut*S, Glycerol Stock (noncompetent)	200 µl	132
Q6321	Bacterial Strain BMH 71-18 *mut*S, Glycerol Stock (noncompetent)	500 µl	132
R1851	10X Flexi® Enzyme Blend (SgfI & PmeI)	25 µl	123
R1852	10X Flexi® Enzyme Blend (SgfI & PmeI)	100 µl	123
R1901	Carboxy Flexi® Enzyme Blend (SgfI & EcoICRI)	50 µl	123
R3961	Bovine Serum Albumin, Acetylated	1 ml	114, 271
R4014	EcoRI (HC)	25,000 u	107
R4024	BamHI (HC)	12,500 u	105
R4374	RsaI (HC)	5,000 u	112
R6011	EcoRI	5,000 u	107
R6017	EcoRI	15,000 u	107
R6021	BamHI	2,500 u	105
R6025	BamHI	12,500 u	105

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