

# NANOVEX

## Biotechnologies

### CATALOGUE 2019



ER-0676/2018

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**NANOVEX**

**Biotechnologies**

Nanovex Biotechnologies is an innovative technology based spin-off founded in 2014 that provides a wide range of products and services in the nanobiotechnology field.

Our specialized team has great experience in the design, development, modification, functionalization and characterization of nanovesicles and metallic nanoparticles for multiple applications.



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# PRODUCTS



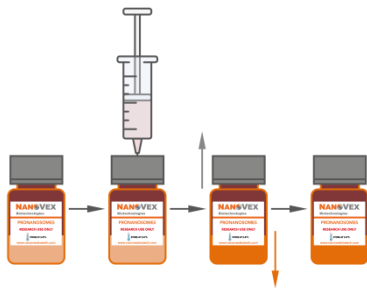
# PRONANOSOMES





Nanovesicles are closed bilayer structures able to entrap a wide range of compounds providing several advantages such as: **encapsulated compound protection, increased bioavailability, controlled delivery, target delivery, great stability and masking undesired tastes, among others.**

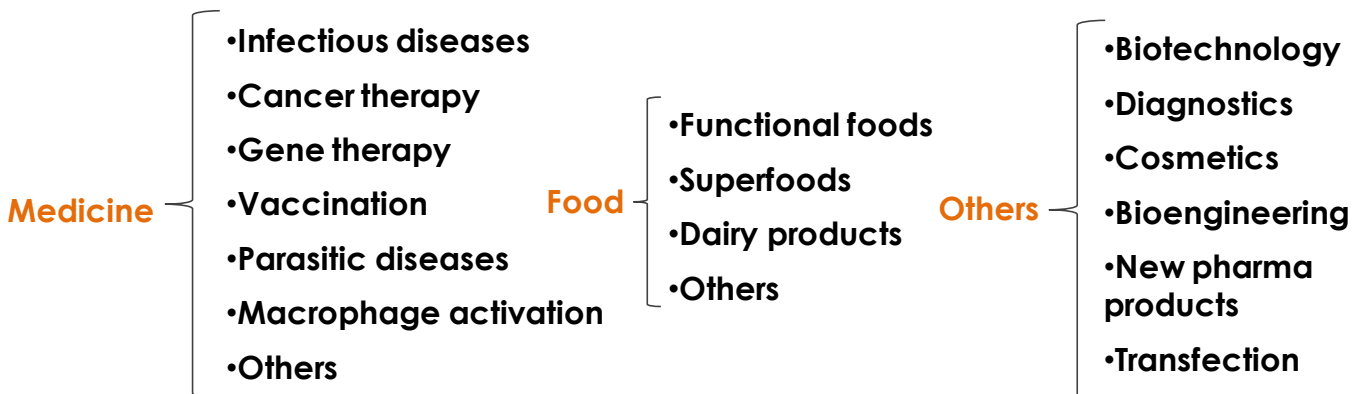
Pronanosomes are ready-to-use formulations to obtain nanovesicles which are able to encapsulate different compounds (Hydrophilic and lipophilic molecules, peptides, proteins,...) in a fast and simple way:

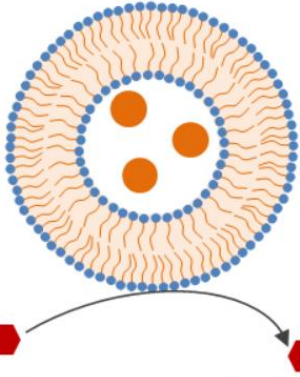


1. **Load**
2. **Shake**
3. **Nanovesicles are ready to use**

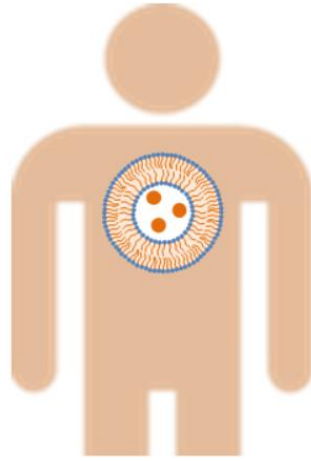
*Size and distribution can be reduced by using vortex or homogenizer. Small Unilamellar Vesicles (SUV) with smaller sizes and narrower distributions are obtained after sonication of the product.*

**Applications**

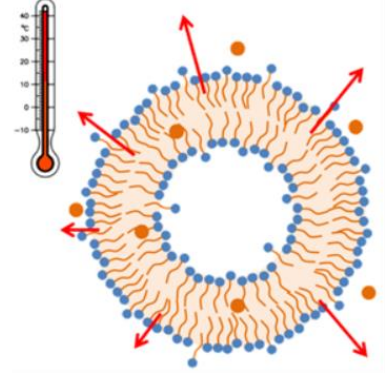




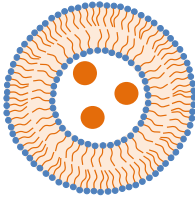
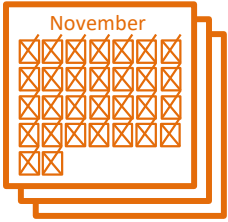
**Encapsulated compound protection**



**Increased bioavailability**



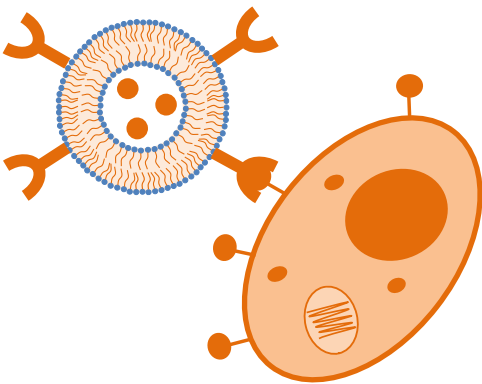
**Controlled delivery**



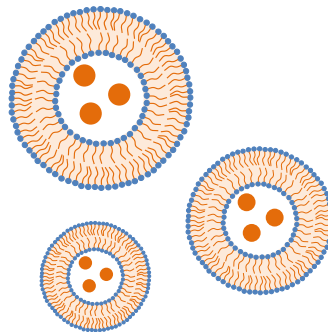
**Great stability**



**Masking undesired tastes**



**Targeted delivery**

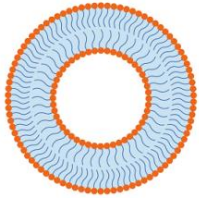


**Size control**



**Easy and fast**

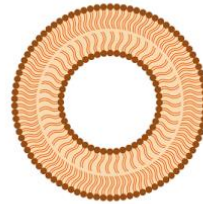
## STANDARD PRONANOSOMES



### PRONANOSOME NIO-N

#### Niosomes

- Stability
- Versatile



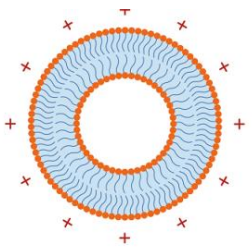
### PRONANOSOME LIPO-N

#### Liposomes

- Natural products

Our standard Pronanosomes are formulated to obtain niosomes or liposomes able to encapsulate different compounds and to be used in multiple applications

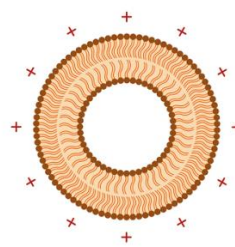
## INTRACELLULAR DELIVERY PRONANOSOMES



### PRONANOSOME NIO-CAT

#### Cationic niosomes

- Positive Z-potential
- Intracellular release



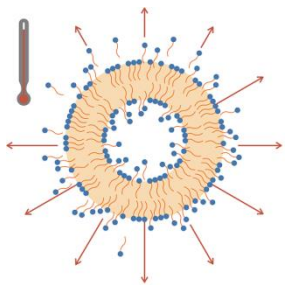
### PRONANOSOME LIPO-CAT

#### Cationic liposomes

- Positive Z-potential
- Intracellular release

Our intracellular delivery Pronanosomes are formulated to obtain niosomes or liposomes able to deliver the encapsulated drug intracellularly

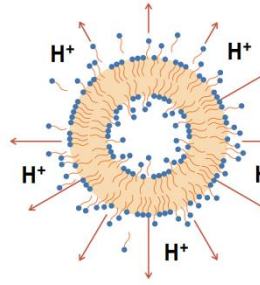
## CONTROLLED DELIVERY PRONANOSOMES



### PRONANOSOME THERMO

#### Thermosensitive

- Controlled released with T



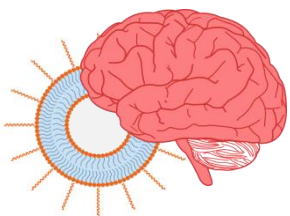
### PRONANOSOME pH

#### Sensitive to pH

- Controlled release with pH

Our controlled delivery Pronanosomes are formulated to obtain nanovesicles able to control the delivery of the encapsulated drug with the temperature or pH.

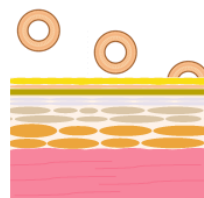
## SPECIFIC APPLICATIONS PRONANOSOMES



### PRONANOSOME-BBB

#### Blood Brain Barrier transcytosis

- Improve brain delivery



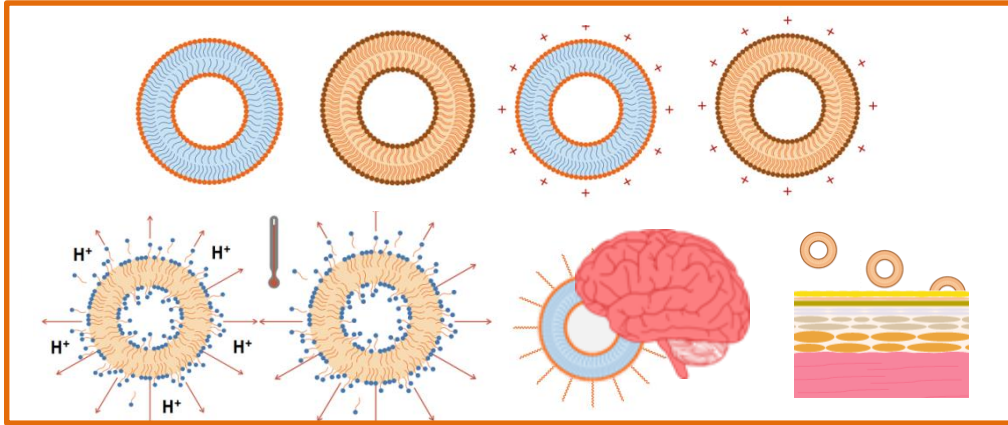
### PRONANOSOME-DERMAL

#### Dermal delivery

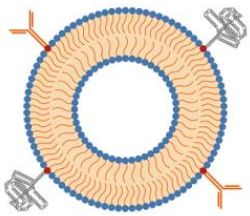
- Improve (trans)dermal delivery

Our Pronanosomes BBB and dermal are formulated to obtain nanovesicles able to vehiculate compounds through the BBB or through the skin, respectively.





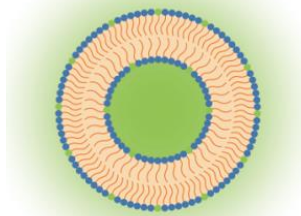
# PRONANOSOME<sup>®</sup>



## BIOCONJUGABLE

All nanovesicles

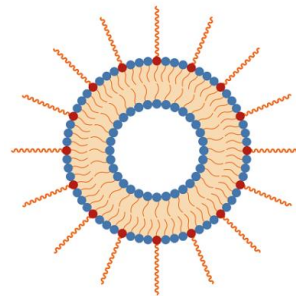
Ready to be  
bioconjugated



## FLUORESCENT

All nanovesicles

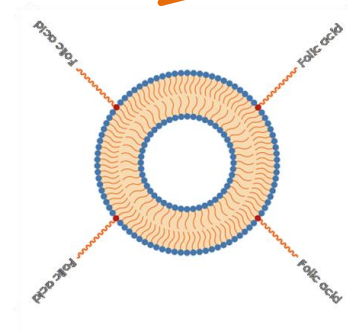
Fluorescent labeled  
nanovesicles



## PEGYLATED

All nanovesicles

PEGylated  
nanovesicles



## FOLIC ACID

All nanovesicles

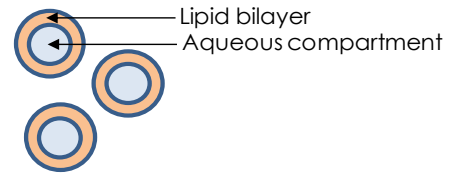
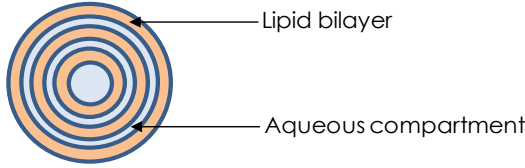
Ready to be  
PEGylated

All our Pronanosomes can be ordered with other extra characteristics shown above (From 1 to 4 simultaneously) to suit the needs of our customers

**IN VITRO TESTED**

**IN VIVO TESTED**

**PRONANOSOME – HOW TO USE?**

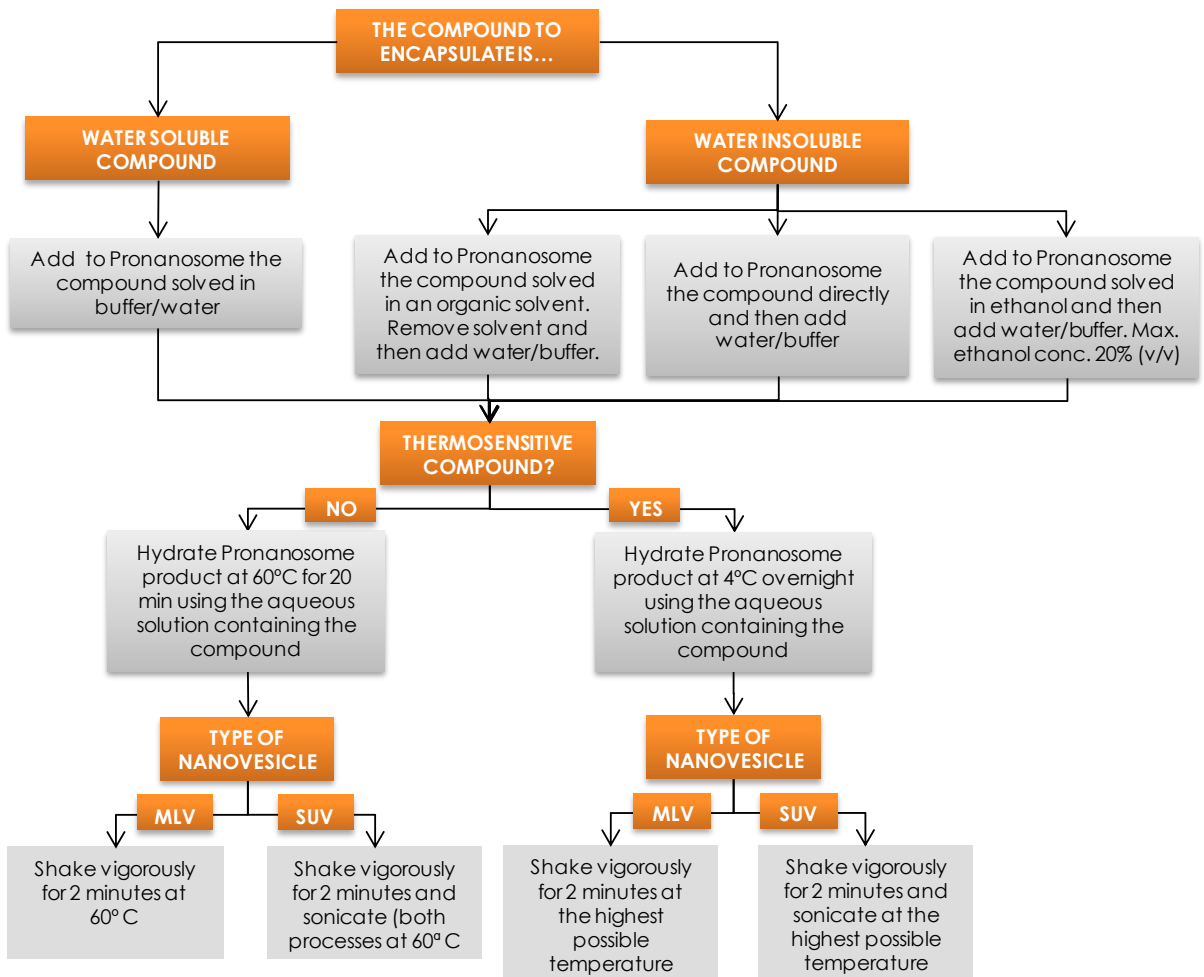


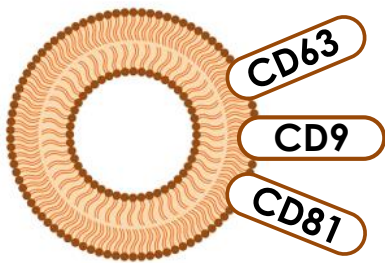
**MultiLamellar Vesicles (MLV)**

**Small Unilamellar Vesicles (SUV)**

- Characteristics
- High encapsulation efficiency
  - Heterogeneous size
  - Easy to obtain
  - Cleared rapidly by the reticulo-endothelial system (RES)

- Characteristics
- High Lipid/Water ratio
  - Relatively easy access to the cells of tissue
  - Homogeneous size
  - Low encapsulation efficiency in aqueous phase

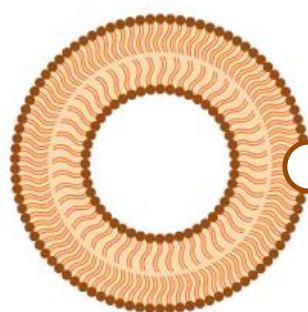




# SYNTHETIC EXOSOMES



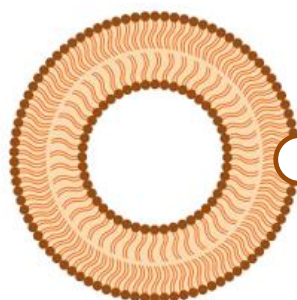
**Synthetic exosomes** are a very interesting tool to use as a standard in different applications such as the validation of exosome isolation tools or detection systems, among others.



**CD9**

### SINEX-CD9

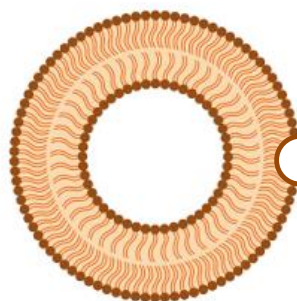
**CD9 Synthetic exosomes** based on liposomes with a composition similar to that of natural exosomes. **Fully characterized. Available with green or red fluorescence.**



**CD63**

### SINEX-CD63

**CD63 Synthetic exosomes** based on liposomes with a composition similar to that of natural exosomes. **Fully characterized. Available with green or red fluorescence.**

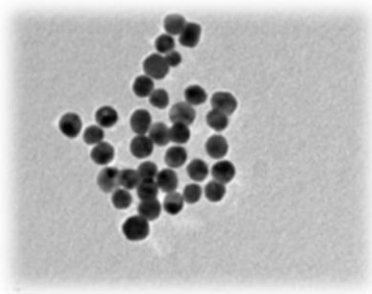


**CD81**

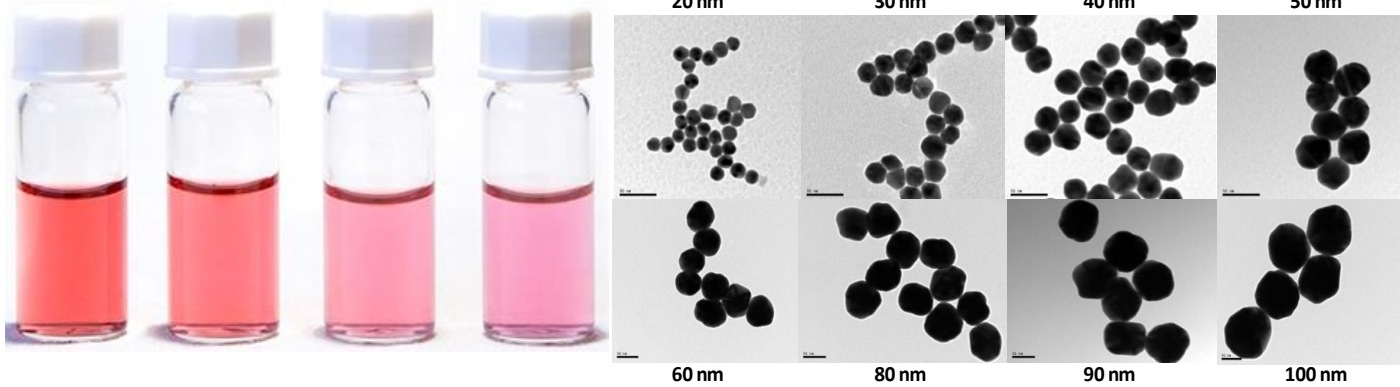
### SINEX-CD81

**CD81 Synthetic exosomes** based on liposomes with a composition similar to that of natural exosomes. **Fully characterized. Available with green or red fluorescence.**

# METALLIC NANOPARTICLES



Nanovex Biotechnologies offers **SPHERICAL** gold nanoparticles which are citrate capped.

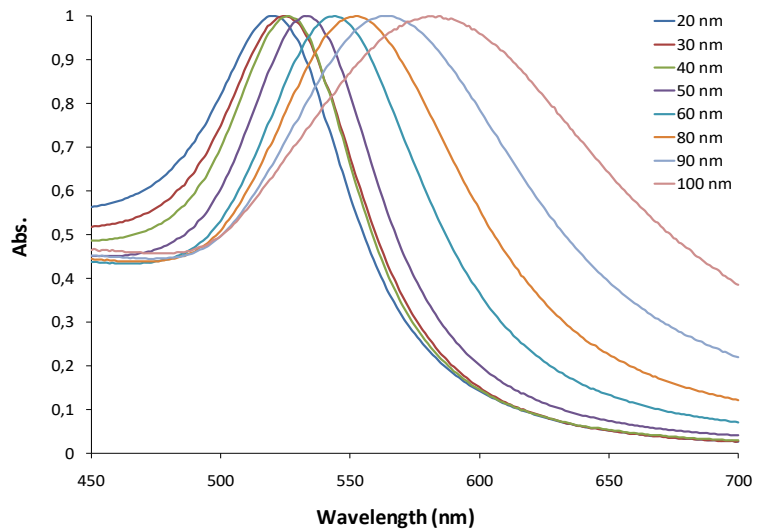


Our gold nanoparticles are available in different sizes ranging from 15 to 100 nm.

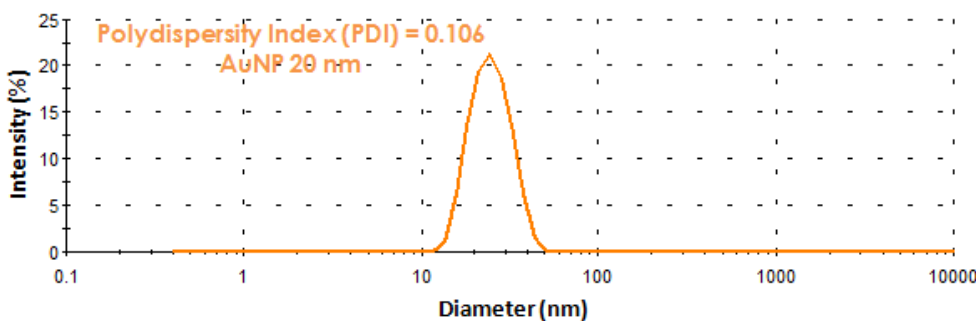


UV-Vis spectra showing optical properties of gold nanoparticles of different sizes.

SIZE	PEAK (nm)
20 nm	521
30 nm	524
40 nm	526
50 nm	533
60 nm	542
80 nm	553
90 nm	564
100 nm	583



DLS spectra showing gold nanoparticles of 20 nm from Nanovex Biotechnologies.



SIZE	PDI
20 nm	0.106
30 nm	0.189
40 nm	0.176
50 nm	0.156
60 nm	0.179
80 nm	0.188
90 nm	0.178
100 nm	0.148

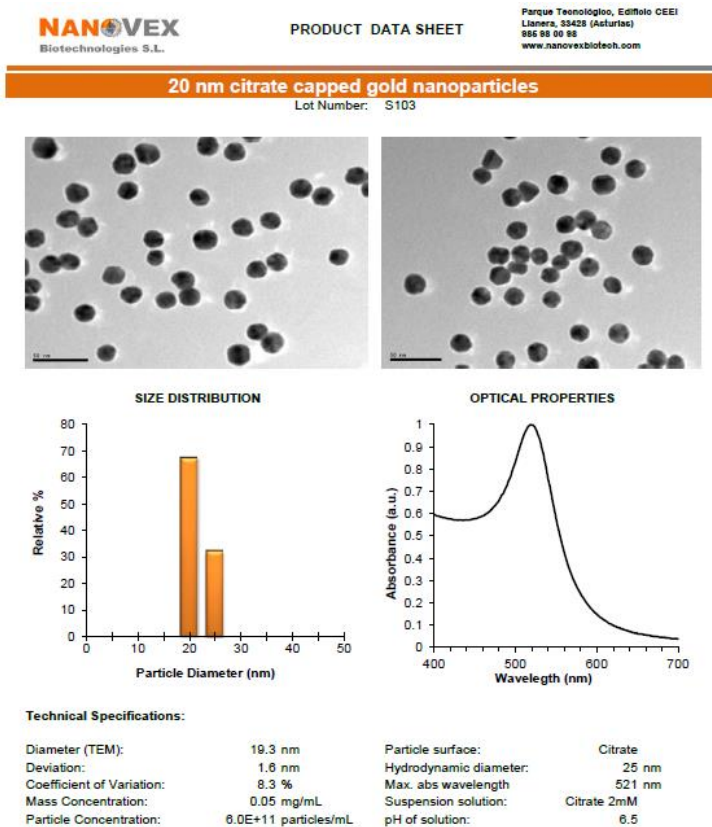
Nanovex **Gold nanoparticles** have an excellent **QUALITY**:



- Narrow size distribution (*typical CV values  $\leq 15\%$* ).
- Batch-to-batch consistency (*typical CV values  $\leq 10\%$* ).
- Full characterization data with all products.
- Product Quality Guarantee.
- Support and service from our nanomaterials experts.



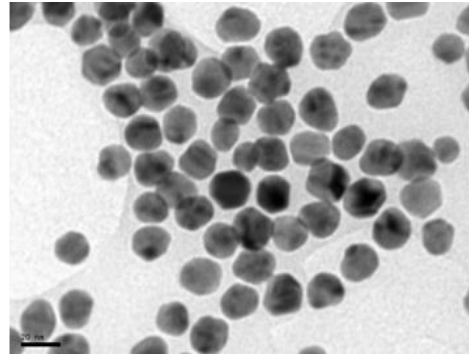
As gold nanoparticles properties are size and shape dependant, Nanovex Biotechnologies guarantee the quality of the supplied nanoparticles providing its customers detailed information of each batch.



**VERSATILITY:** Gold nanoparticles can be used in a wide range of applications

Application	Size (nm)	Surface Functionalization
Protein conjugation	15-100	Citrate, streptavidine, COOH
Modification with thiolated ligands	15-100	Citrate
Western blot/ dot blot	15	Streptavidine
Immunohistochemistry	15-40	Streptavidine
Flow cytometry	50-100	Citrate
Celular uptake	30-60	Citrate
Lateral flow immunoassays	30-80	Citrate, streptavidine, COOH
ELISA	15-30	Streptavidine
Microscopy	50-100	Streptavidine

Nanovex Biotechnologies offers **SPHERICAL silver nanoparticles** which are tannic acid capped.



**NANOVEX**  
Biotechnologies S.L.

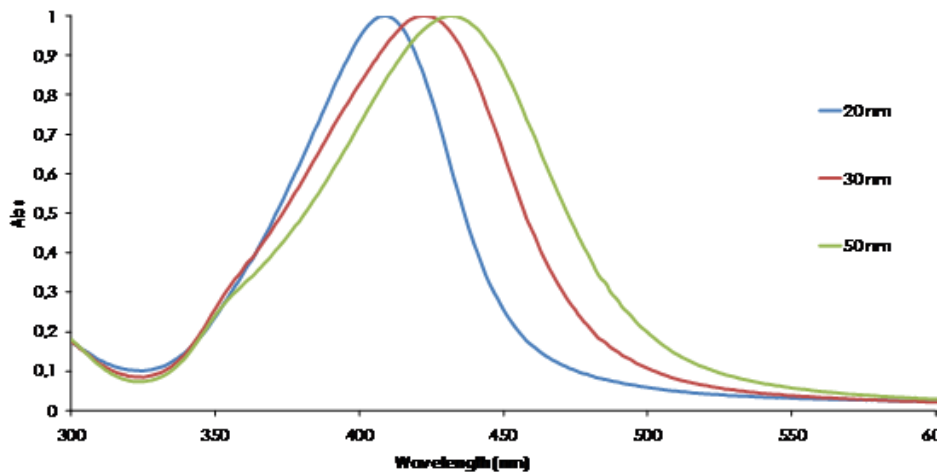
Our silver nanoparticles are available in different sizes: 20, 30 and 50 nm.

20 nm

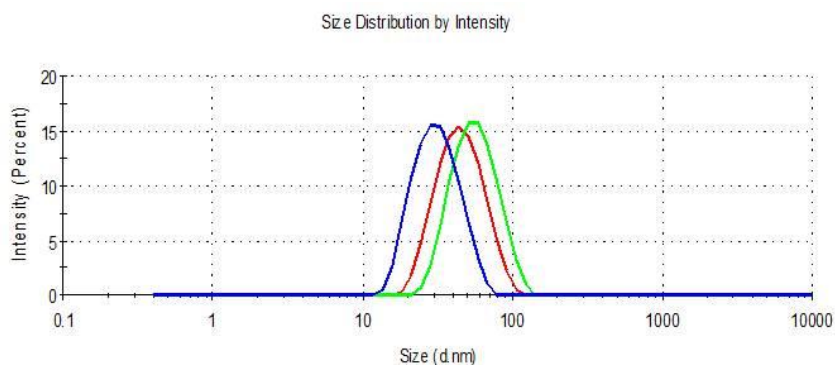
30 nm

50 nm

UV-Vis spectra showing optical properties of silver nanoparticles of different sizes.



DLS spectra showing different sizes of silver nanoparticles.





Nanovex **Silver nanoparticles** have an excellent **QUALITY**:



- Narrow size distribution .
- Batch-to-batch consistency.
- Full characterization data with all products.
- Product Quality Guarantee.
- Support and service from our nanomaterials experts.



**NANOVEX**  
Biotechnologies S.L.

As silver nanoparticles properties are size and shape dependant, Nanovex Biotechnologies guarantee the quality of the supplied nanoparticles providing its customers detailed information of each batch.

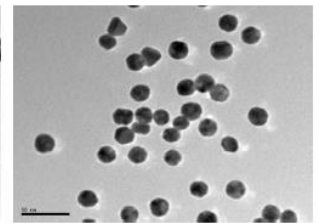
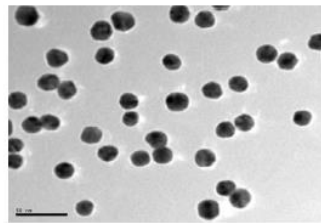
**NANOVEX**  
Biotechnologies S.L.

PRODUCT DATA SHEET

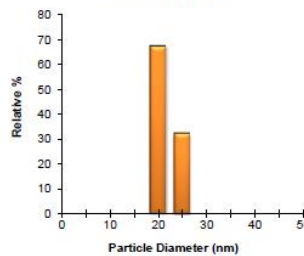
Parque Tecnológico, Edificio CEEI  
Llanera, 33428 (Asturias)  
9142 91 00 92  
www.nanovexbiotech.com

### 20 nm citrate capped gold nanoparticles

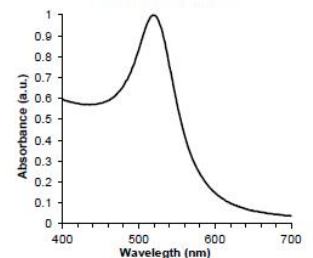
Lot Number: S103



SIZE DISTRIBUTION



OPTICAL PROPERTIES



**Technical Specifications:**

Diameter (TEM):	19.3 nm	Particle surface:	Citrate
Deviation:	1.8 nm	Hydrodynamic diameter:	25 nm
Coefficient of Variation:	8.3 %	Max. abs wavelength:	521 nm
Mass Concentration:	0.05 mg/mL	Suspension solution:	Citrate 2mM
Particle Concentration:	6.0E+11 particles/mL	pH of solution:	6.5

**VERSATILITY:** Silver nanoparticles can be used in a wide range of applications

### Applications

Protein conjugation

Modification with thiolated ligands

Western blot/ dot blot

Molecular Imaging

Nanotoxicology

Antibacterial

Lateral flow immunoassays

ELISA

SERS

Nanovex Biotechnologies **gold/silver alloy nanoparticles** are synthesized through citrate reduction method in absence of additional stabilizing agents.

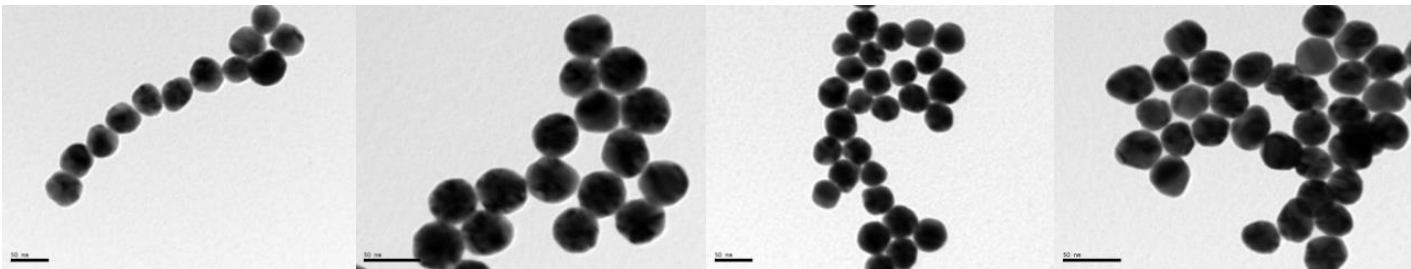


100 % Ag



100 % Au

The optoelectronic properties of these alloyed nanoparticles are tunable varying the nanoparticle composition in stead of varying nanoparticle size.



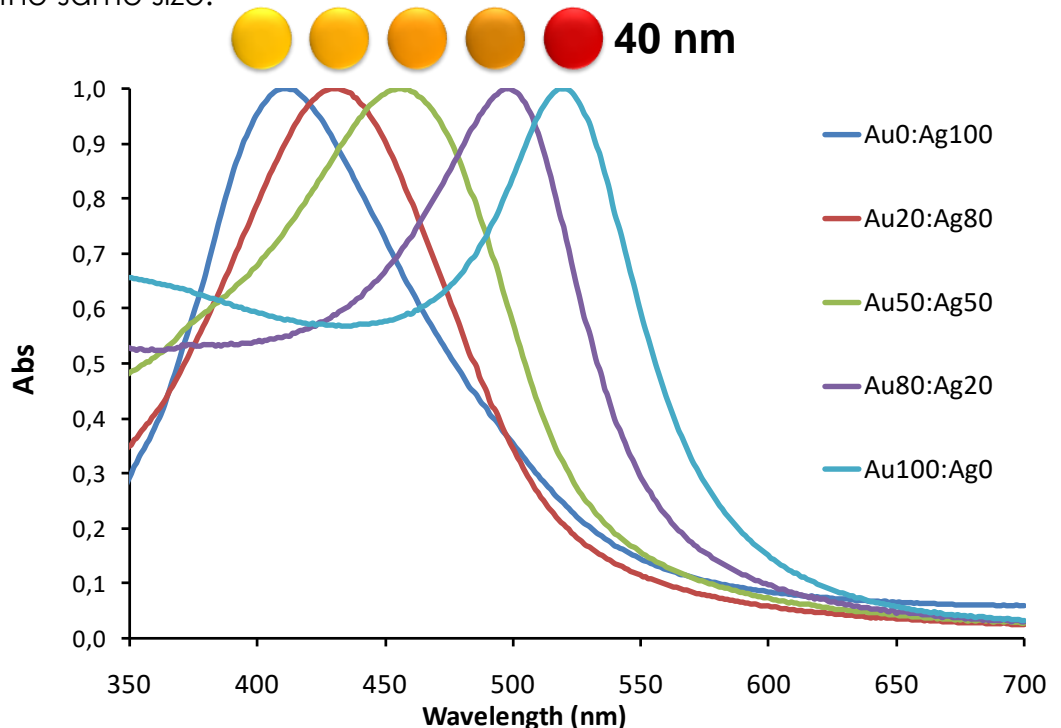
Au0:Ag100

Au20:Ag80

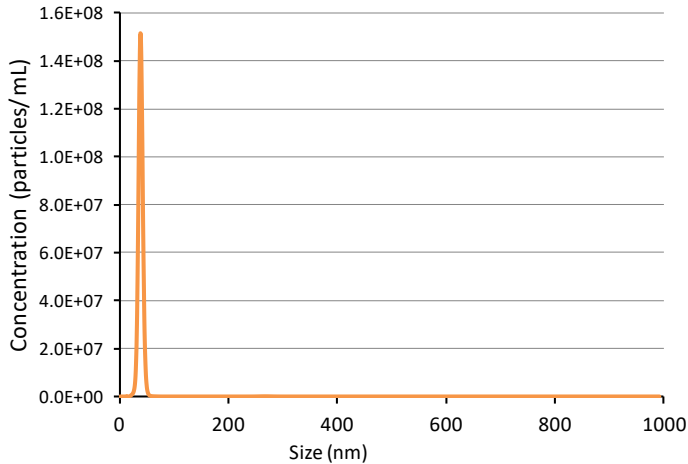
Au50:Ag50

Au100:Ag0

The optoelectronic properties of these alloyed nanoparticles differ from pure gold or silver nanoparticles of the same size.



Alloyed nanoparticles analyzed by Nanoparticle Tracking Analysis.



**Nanovex Biotechnologies gold/silver nanoparticles are monodispersed nanoparticles with silver like optical properties.**

These nanoparticles maintain their optical properties in the 400-500 nm range while avoiding the use of silver nanoparticles of low (< 20 nm) or high size (60-100 nm) to have similar properties.

COMPOSITION	SIZE	PEAK (nm)
Au0:Ag100	40 nm	411
Au20:Ag80	40 nm	431
Au50:Ag50	40 nm	456
Au80:Ag20	40 nm	498
Au100:Ag0	40 nm	526

Our gold/silver nanoparticle are also a alternative in the development of nanomaterial bioconjugates, electrocatalytic applications or biosensing with multiplexed detection.

Application	Surface Functionalization
Protein conjugation	Citrate, streptavidine, COOH
Modification with thiolated ligands	Citrate
Western blot/ dot blot	Streptavidine
Inmunohistochemistry	Streptavidine
Flow cytometry	Citrate
Celular uptake	Citrate
Lateral flow immunoassays	Citrate, streptavidine, COOH
ELISA	Streptavidine
Microscopy	Streptavidine

Nanovex Biotechnologies offers **lipic acid functionalized SPHERICAL gold, silver and gold-silver alloy nanoparticles.**

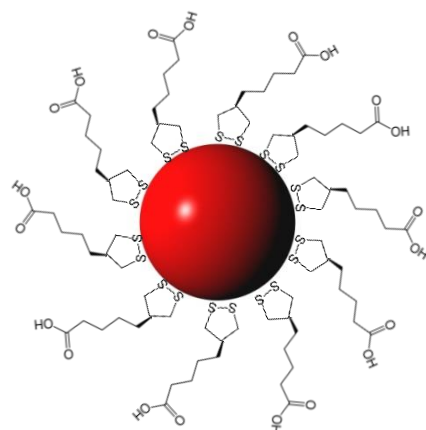


Nanovex lipic acid functionalized nanoparticles are ideal for conjugation of proteins and other primary amines using EDC/NHS coupling chemistry.



- Available in different sizes and materials.
- Narrow size distribution and batch-to-batch consistency.
- Carboxyl group high density.
- Full characterization data with all products.
- Product Quality Guarantee.
- Support and service from our nanomaterials experts.

Lipoic acid nanoparticles can be used in many applications such as protein conjugation, western blot/dot blot, microscopy applications, lateral flow assays, ELISA or dark field microscopy.

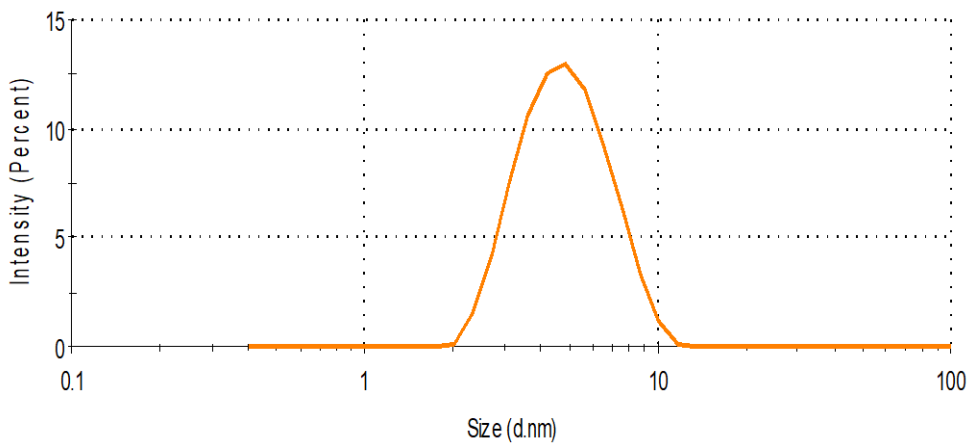




**Carbon dots is a new class of fluorescent carbon nanomaterials.**

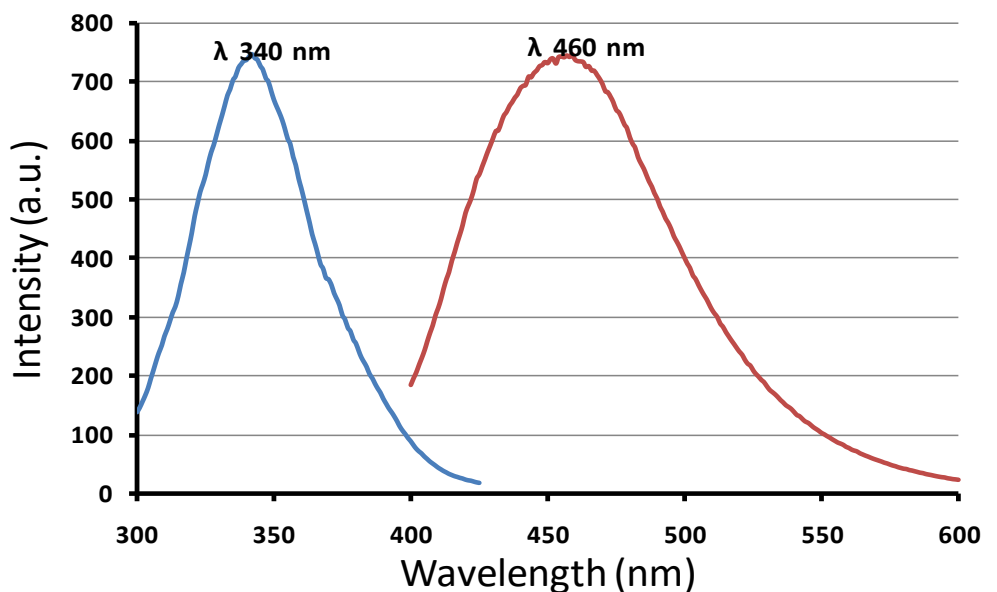
Carbon dots possess the attractive properties of high stability, good conductivity, low toxicity, environmental friendliness as well as comparable optical properties to quantum dots

Size Distribution by Intensity



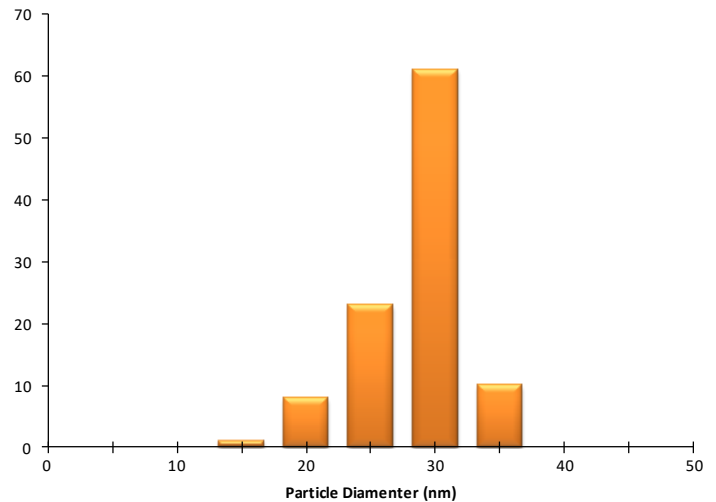
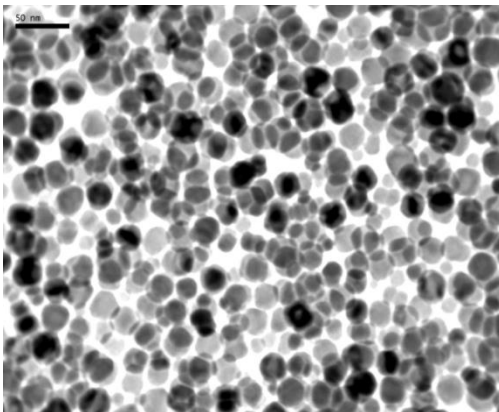
### Applications

- Bioimaging
- Sensing
- Drug delivery
- Catalysis
- Optoelectronics

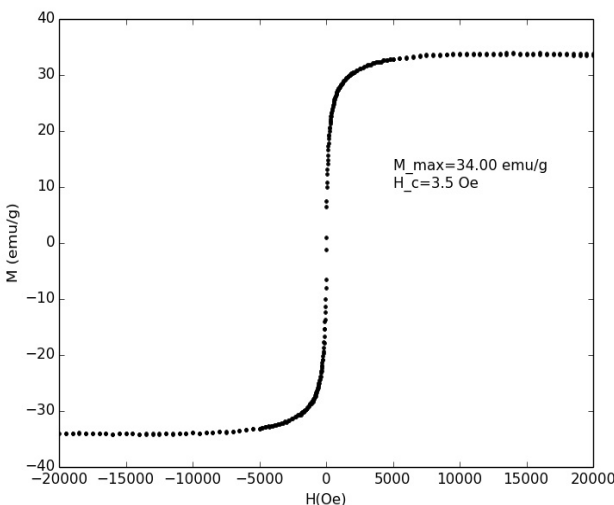




Nanovex Biotechnologies offers 20 nm **superparamagnetic iron oxide nanoparticles (SPIONS)** which are oleic acid capped and dispersed in toluene.

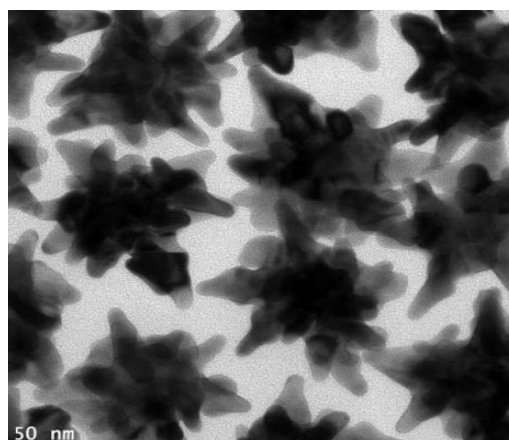
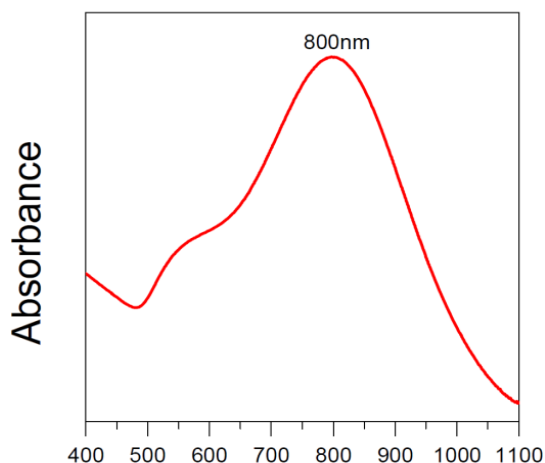


Magnetization > 20 emu/g



Application
Magnetic storage
Drug delivery
Biosensing
Magnetic separation
Contrast reagent for imaging
Lateral flow magneto-immunoassays

**Gold nanostars** are novel star-shaped gold nanoparticles with interesting properties for different applications such as plasmonics, spectroscopy, biomedicine, biosensor, medical diagnostics, cancer therapies and energy conversion.

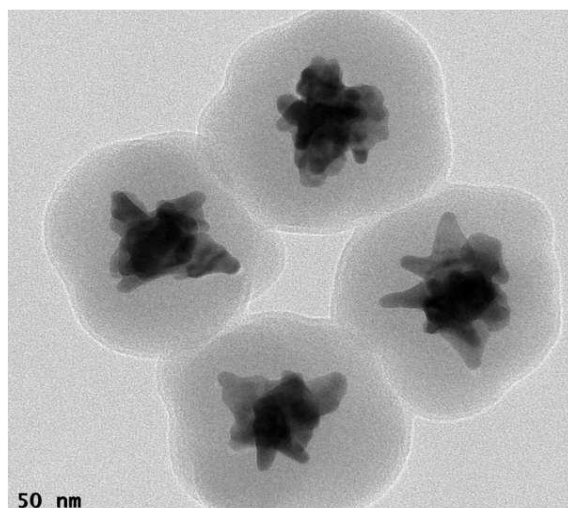
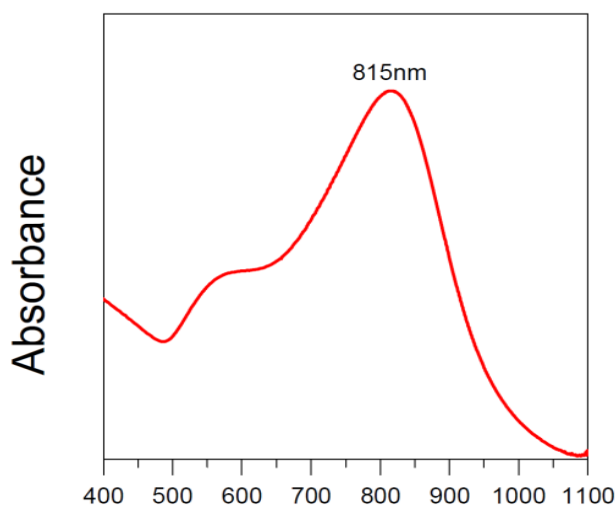


## TECHNICAL SPECIFICATIONS

<b>Technical name</b>	AuNStars@PVP
<b>Size (nm)</b>	40
<b>Stabilizer</b>	PVP
<b>Dispersion medium</b>	Water, alcohols, THF, DMF
<b>Nucleus material</b>	Au
<b>Nucleus size (nm)</b>	40
<b>Coating material</b>	-
<b>Coating thickness (nm)</b>	-
<b>Absorbance maximum wavelength (nm)</b>	800
<b>Equivalence 1OD (mg/ml)</b>	0,037
<b>Minimum Stability period (months)</b>	12
<b>Storage temperature ( °C)</b>	20 – 25 (4 – 6 for THF)



**Silica coated Gold nanostars** apart from the advantages of Gold nanostars, the silica coating provides another versatile conjugation surface



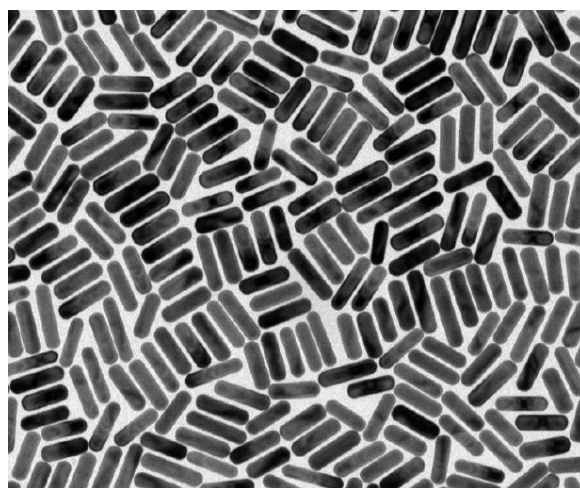
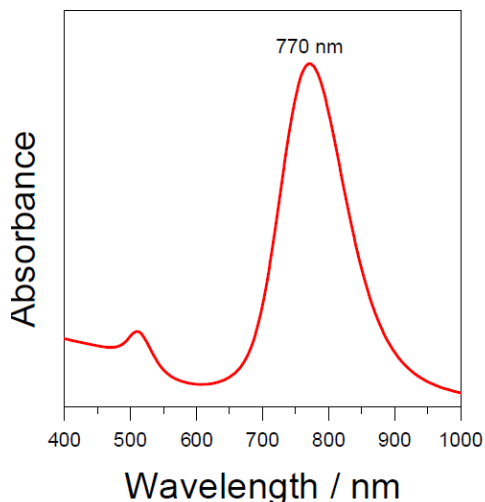
## TECHNICAL SPECIFICATIONS

<b>Technical name</b>	AuNStars@SiO <sub>2</sub>
<b>Size (nm)</b>	50
<b>Stabilizer</b>	-
<b>Dispersion medium</b>	Alcohols
<b>Nucleus material</b>	Au
<b>Nucleus size (nm)</b>	40
<b>Coating material</b>	SiO <sub>2</sub>
<b>Coating thickness (nm)</b>	10 - 30
<b>Absorbance maximum wavelength (nm)</b>	815
<b>Equivalence 1OD (mg/ml)</b>	0,067
<b>Minimum Stability period (months)</b>	12
<b>Storage temperature ( °C)</b>	20 – 25





**Gold nanorods**, apart from the advantages of Gold nanoparticles, the silica coating provides another versatile conjugation surface



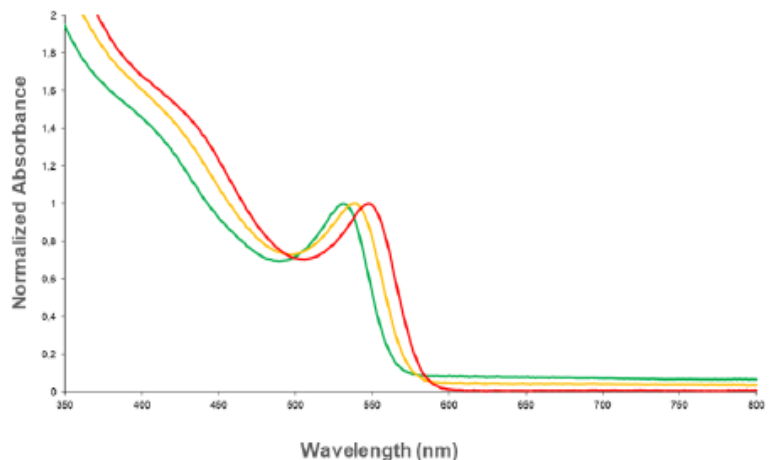
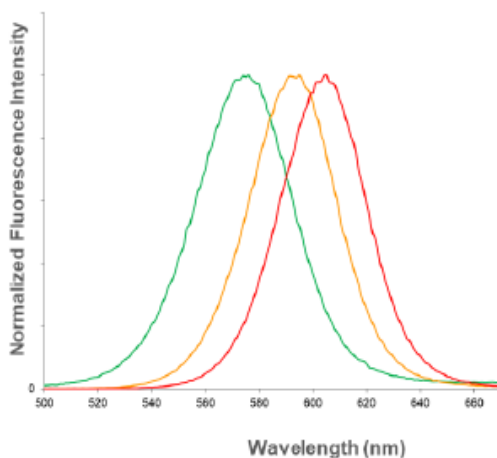
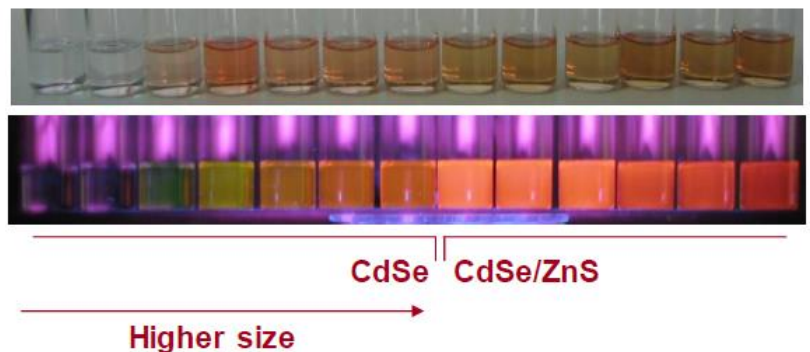
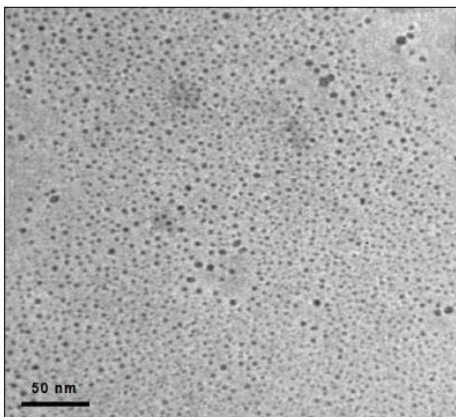
## TECHNICAL SPECIFICATIONS

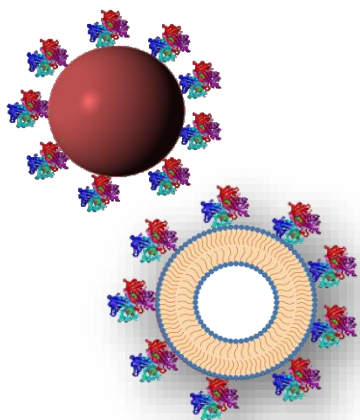
<b>Technical name</b>	AuNRs@CTAB
<b>Size (nm)</b>	84x24
<b>Stabilizer</b>	CTAB
<b>Dispersion medium</b>	water
<b>Nucleus material</b>	84x24
<b>Nucleus size (nm)</b>	14
<b>Coating material</b>	-
<b>Coating thickness (nm)</b>	-
<b>Absorbance maximum wavelength (nm)</b>	770
<b>Equivalence 1OD (mg/ml)</b>	0,016
<b>Minimum Stability period (months)</b>	3
<b>Storage temperature ( °C)</b>	25 - 27

**Quantum Dots (QDs)** are nanoparticles (3-4 nm) of semiconducting materials. Their luminescence properties makes them an attractive alternative to conventional luminophores, and for other numerous applications.



- **QDs/CdSe:** Quantum Dots (QDs) with a CdSe core. Max abs:  $560 \pm 5$  nm,  $575 \pm 5$  nm or  $590 \pm 5$  nm. Dispersed in chloroform.
- **QDs/CdSe/ZnS:** Quantum Dots (QDs) with a CdSe core and a ZnS shell. Max abs:  $580 \pm 5$  nm,  $590 \pm 5$  nm or  $615 \pm 5$  nm. Dispersed in chloroform or water.





# CONJUGATED NANOPARTICLES

Nanovex Biotechnologies offers **streptavidin conjugated SPHERICAL gold, silver and gold-silver alloy nanoparticles.**



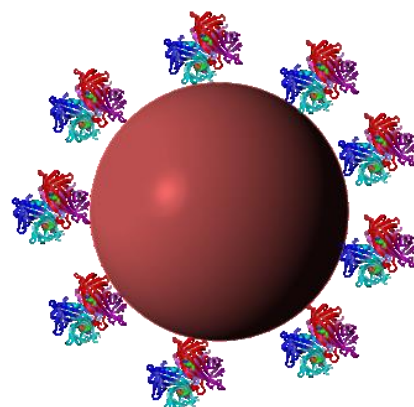
Nanovex streptavidin conjugated nanoparticles has an excellent QUALITY:



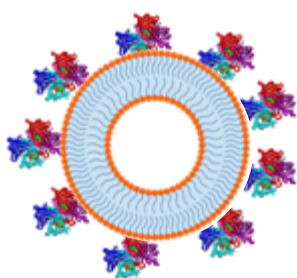
- Narrow size distribution
- Batch-to-batch consistency
- Full characterization data with all products.
- Product Quality Guarantee.
- Support and service from our nanomaterials experts.

**Nanovex Biotechnologies streptavidin nanoparticles can be employed for binding to several biotinylated ligand, like as antibodies, peptides or other biomolecules.**

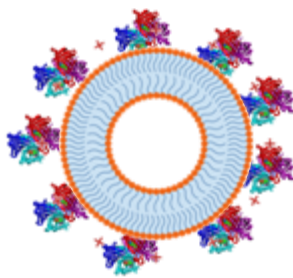
Streptavidin nanoparticles can be used in many applications such as protein conjugation, western blot/dot blot, immunohistochemistry, lateral flow assays, ELISA or dark field microscopy.



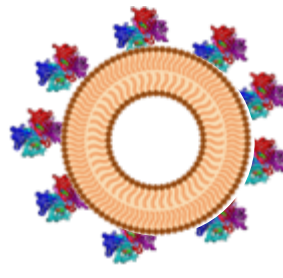
Nanovex Biotechnologies offers **streptavidin conjugated nanovesicles**.  
Available on all nanovesicles of our catalogue



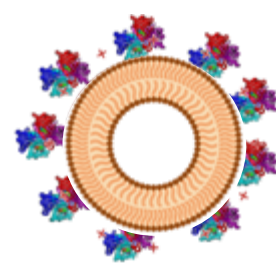
**Nio-N**



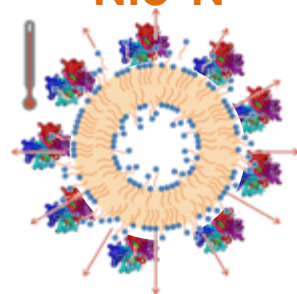
**Nio-Cat**



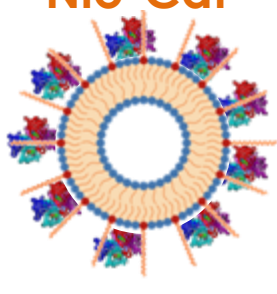
**Lipo-N**



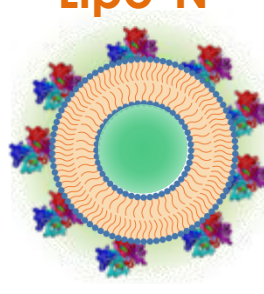
**Lipo-cat**



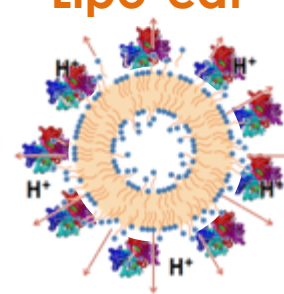
**Thermo**



**Pegylated**



**Fluorescent**



**pH**

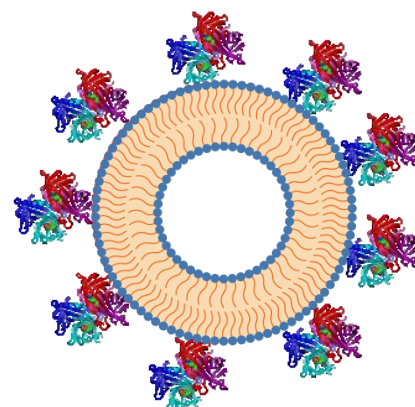
Nanovex streptavidin conjugated nanovesicles has an excellent QUALITY:

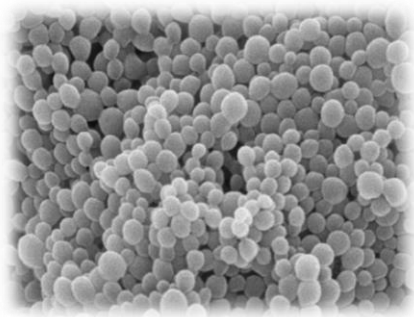


- Narrow size distribution
- Batch-to-batch consistency
- Full characterization data with all products.
- Product Quality Guarantee.
- Support and service from our nanomaterials experts.

**Nanovex Biotechnologies streptavidin nanovesicles can be employed for binding to several biotinylated ligand, like as antibodies, peptides or other biomolecules.**

Streptavidin nanovesicles can be used in many applications such as protein conjugation, western blot/dot blot, immunohistochemistry, lateral flow assays, ELISA or dark field microscopy.

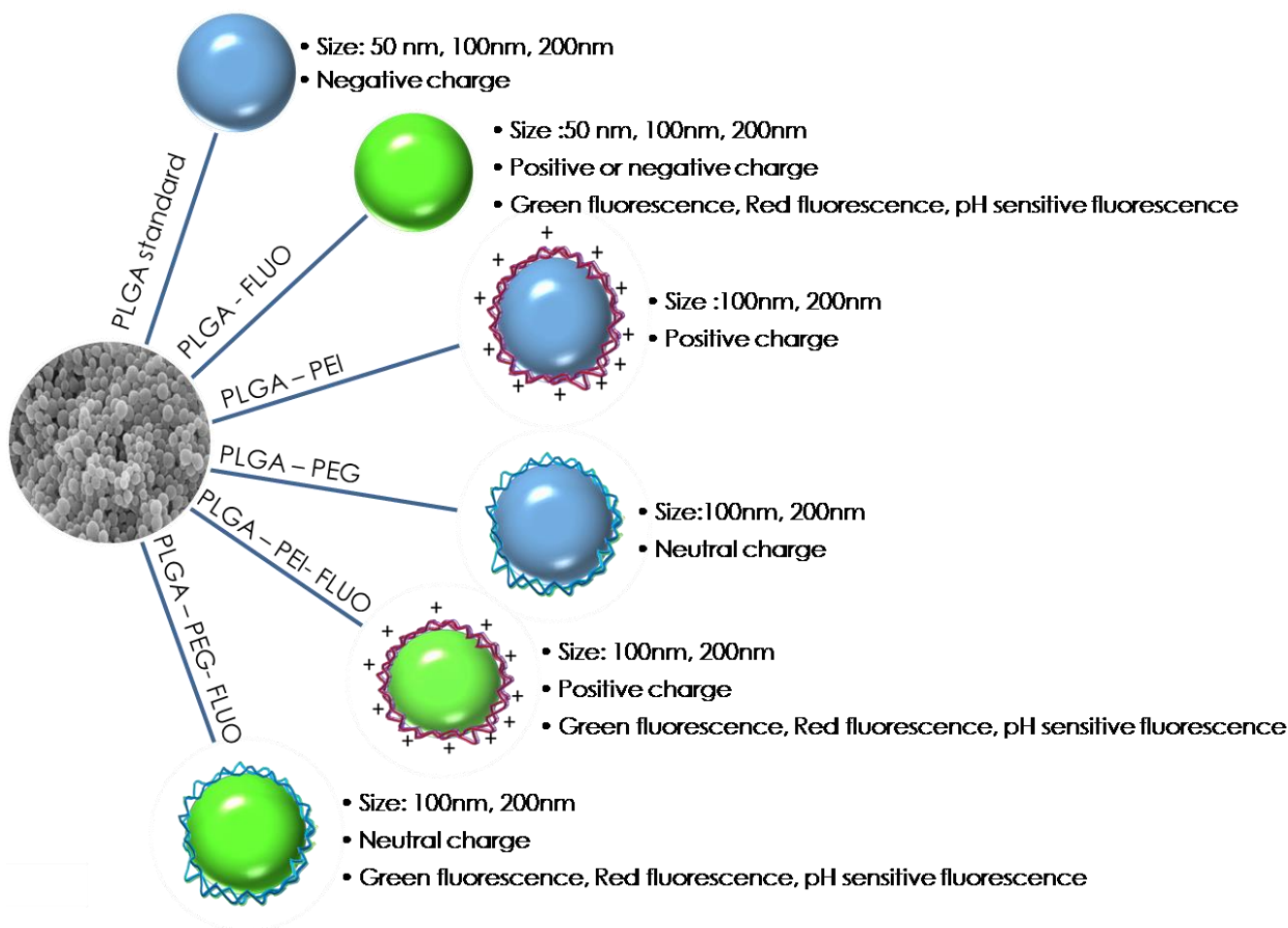




# PLGA

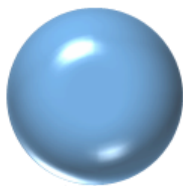
## Nanoparticles

Poly(lactic-co-glycolic acid) (**PLGA**) is one of the most successfully developed biodegradable polymers. PLGA is a biocompatible, biodegradable and safely administrable polymer approved by the US FDA (Food and Drug Administration) and EMA (European Medicines Agency).



Nanovex Biotechnologies provides plain polymeric biodegradable nanoparticles (Nps) based on poly(lactide-co-glycolide) (PLGA) acid terminated with a lactide/glycolide ratio of 50/50 and a molecular weight of 32000 Da. There are different types of PLGA nanoparticles so that our clients can select the nanoparticle that best suits their needsnanoparticles. In addition, these nanoparticles can be externally functionalized with different compounds ( $\text{NH}_2^+$ , PEI, proteins,...)

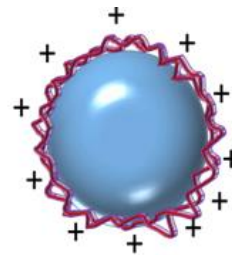
PLGA nanoparticles are available in various sizes of 50, 100 and 200nm



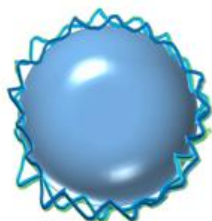
**PLGA Standard nanoparticles** can encapsulate both hydrophilic and lipophilic compounds. These nanoparticles are negative charged and they are available in different sizes (50, 100 or 200 nm)



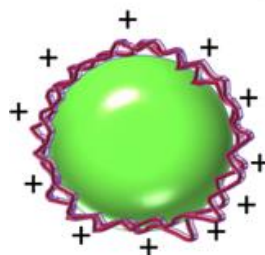
**PLGA-FLUO nanoparticles** can encapsulate both hydrophilic and lipophilic compounds. These nanoparticles can show different types of fluorescence (green, red or pH sensitive fluorescence) and they are available in different sizes (50, 100 or 200 nm)



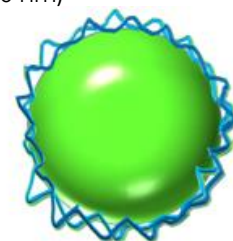
**PLGA-PEI nanoparticles** can encapsulate both hydrophilic and lipophilic compounds. These nanoparticles are positive charged due to the surface modification with PEI. PLGA-PEI nanoparticles are recommended for gene or drug delivery (intracellular delivery) and they are available in different sizes (100 or 200 nm)



**PLGA-PEG nanoparticles** can encapsulate both hydrophilic and lipophilic compounds. These nanoparticles are surface modified with PEG and they are recommended for "in vivo" assays. PLGA-PEG nanoparticles are available in different sizes (100 or 200 nm)



**PLGA-PEI-FLUO nanoparticles** can encapsulate both hydrophilic and lipophilic compounds. These nanoparticles are positive charged due to the surface modification with PEI and they can show different types of fluorescence (green, red or pH sensitive fluorescence), they are recommended for gene or drug delivery (intracellular delivery) with fluorescence detection. PLGA-PEI-FLUO nanoparticles are available in different sizes (100 or 200 nm)



**PLGA-PEG-FLUO nanoparticles** can encapsulate both hydrophilic and lipophilic compounds. These nanoparticles are surface modified with PEG and they can show different types of fluorescence (green, red or pH sensitive fluorescence), they are recommended for "in vivo" assays with fluorescence detection. PLGA-PEG-FLUO nanoparticles are available in different sizes (100 or 200 nm)

**Nanovex offers a customized service to design, develop and produce specific PLGA nanoparticles suitable for drug delivery, targeted drug delivery, gene delivery, theranostics, modeled to the specific needs of the customers.**





# PRACTICE KITS

## Nanoencapsulation PRACTICE KIT

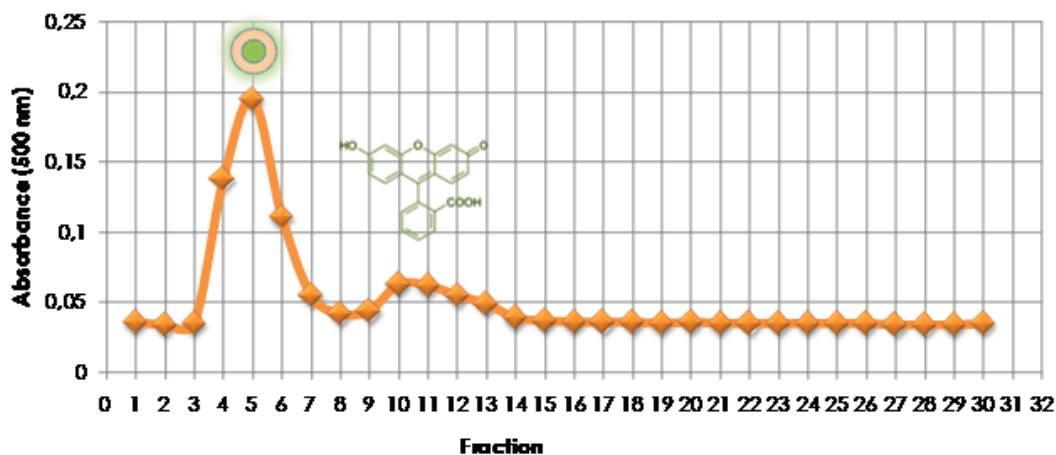
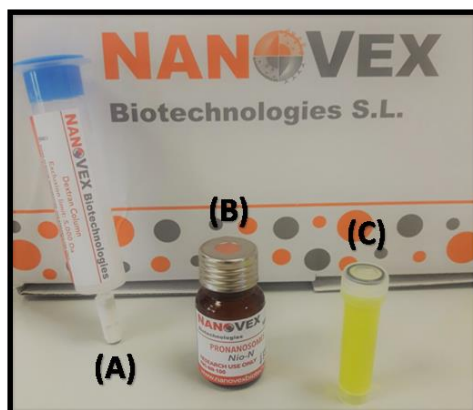


The **practice nanoencapsulation kit** offers a clear and pedagogic method for learning about nanoencapsulation and purification techniques.

**Practice Nanoencapsulation kit** to nanoencapsulate fluorescein into nanovesicles and to determine entrapment efficiency.

The kit is composed by:

- A. Size Exclusion Chromatography (SEC) Column
- B. Pronanosome (Product to form nanovesicles)
- C. Fluorescein solution (100  $\mu$ M)



*Elution profile obtained from a 200  $\mu$ l sample of nanovesicles containing fluorescein and unencapsulated fluorescein (1 ml fractions)*



# OTHER PRODUCTS

Check out our **reagents of labeling technologies!** These products provide researchers more flexibility and choice for their experiments. For more information or questions, please, **contact us!**

- Streptavidin-fluorescein**

- Streptavidin-SATA**

- Streptavidin-maleimide**

- Albumin-Biotin**

- Albumin-fluorescein**

- HRP-SATA**

- HRP-biotin**

- HRP-maleimide**

- Sulfo-NHS-biotin**

Our SEC columns are available with different resins and volumes.

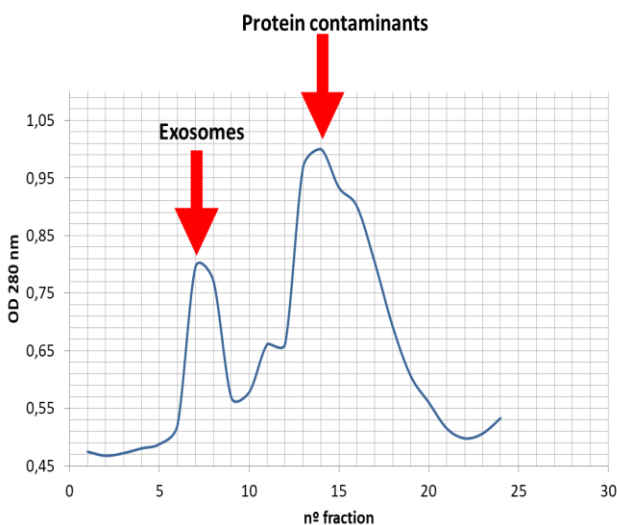
Applications:

- Desalting
- Protein purification
- Nanovesicles purification
- Others



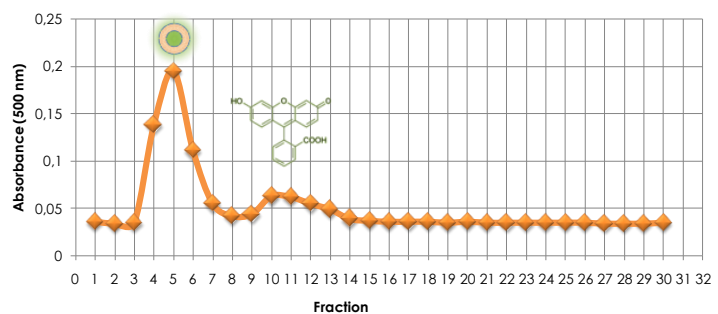
### Eviso-Column

The **Nanovex-Eviso Column** allows quick and economical **exosome purifications**. The Nanovex-Eviso columns are shipped containing ultrapure water/ethanol (20% v/v ethanol) as a preservative.



### SEC5K-Column

The **Nanovex-SEC5K column** allows quick and economical **purifications (protein, nanovesicle or nucleic acid)** with exclusion limits of 5 kDa. The Nanovex-SEC5K columns are shipped containing ultrapure water /ethanol (20% v/v ethanol) as a preservative.



# SERVICES



## NANOENCAPSULATION OF COMPOUNDS

Nanoencapsulation of compounds /biomolecules (molecules, peptides, proteins and DNA, among others) in nanovesicles or PLGA nanoparticles for different applications.

## CUSTOM NANOSYSTEMS

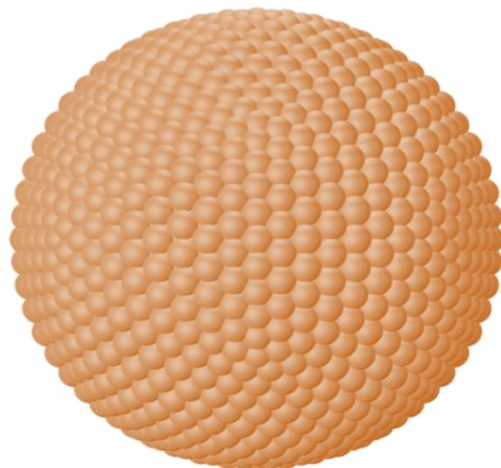
Nanovex develops custom nanovesicles or nanoparticles in order to meet your requirements:

- Formulation
- Size and distribution
- Z-Potential
- Surface modification

## SURFACE MODIFICATION

Surface modification of nanovesicles and nanoparticles allows to achieve different delivery strategies such as:

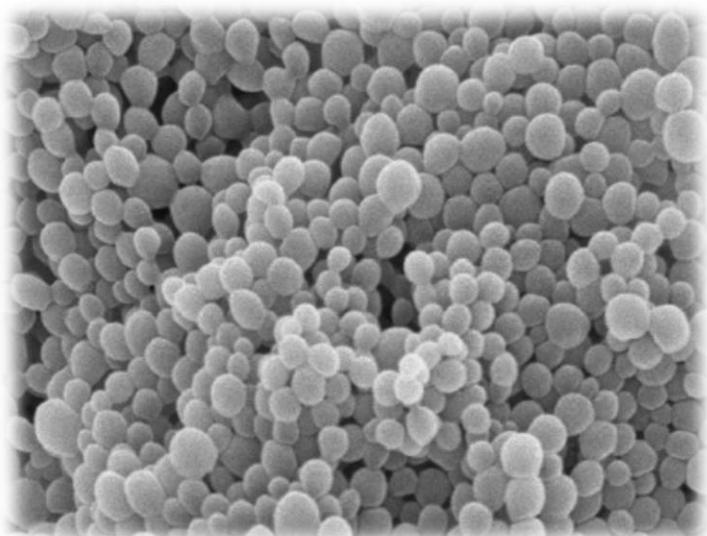
- Long-circulating liposomes
- Intracellular delivery
- Targeted delivery



## DELIVERY STUDIES

Delivery studies of the final encapsulated compound, peptide or protein, can be performed by Nanovex, for instance, simulating different conditions :

- Gastric conditions
- Intestinal conditions
- Dermal/Transdermal assays

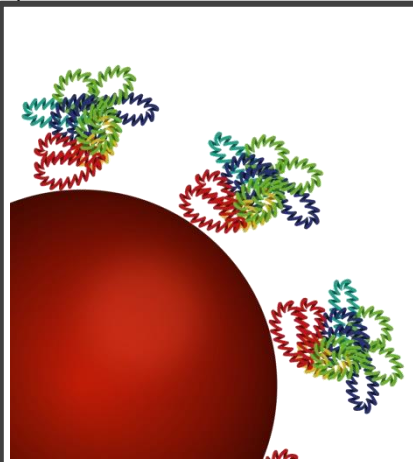


## How do we work?

1. Select the right system
2. Send the compound to encapsulate
3. After 2-4 weeks, Nanovex will provide your system with a full characterization

## SURFACE MODIFICATION / BIOCONJUGATION

Nanovex has a wide experience in the field of surface modification of both nanoparticles and nanovesicles with different biomolecules, apart from the bioconjugation of proteins and DNA with different labels. After the surface modification or bioconjugation process, the product is purified and fully characterized in order to get a high quality and purified surface modified final product.

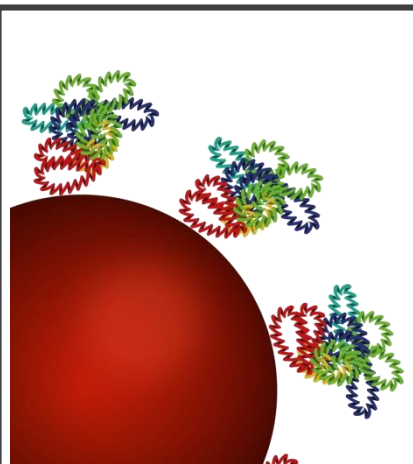


### SURFACE MODIFICATION – OPTION 1

**Nanomaterials to modify:** Nanoparticles and nanovesicles

**Technique:** Passive adsorption / Covalent conjugation

**Characterization:** UV-VIS

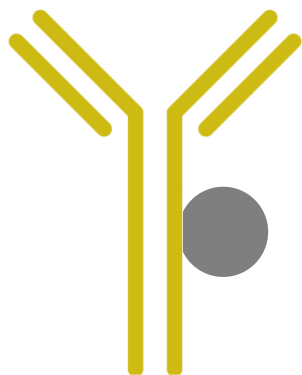


### SURFACE MODIFICATION – OPTION 2

**Nanomaterials to modify:** Nanoparticles and nanovesicles

**Technique:** Passive adsorption / Covalent conjugation

**Characterization:** ICP-MS



### BIOCONJUGATION

**Biomolecules to modify:** Antibodies, enzymes, proteins, and DNA.

**Technique:** Covalent conjugation

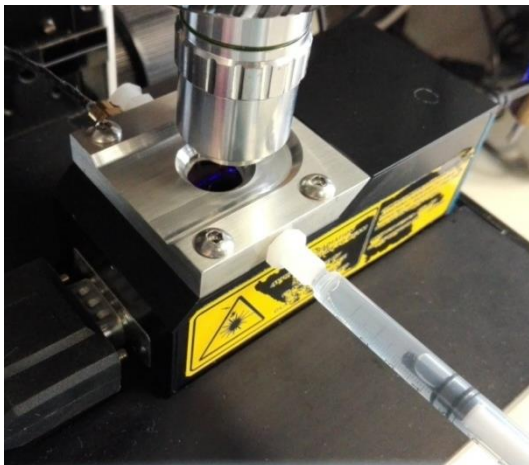
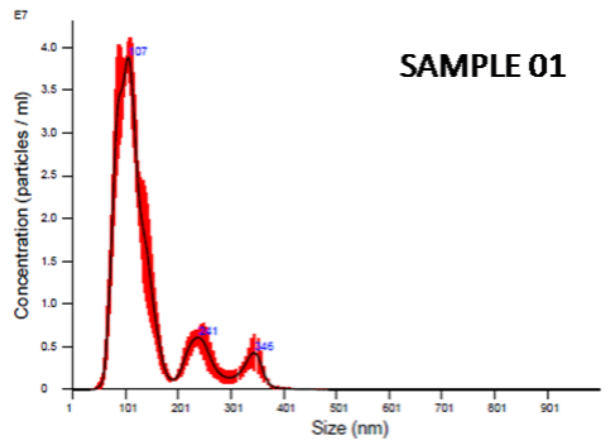
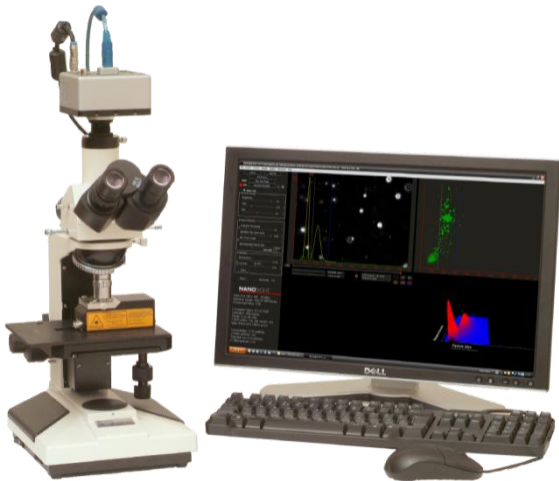
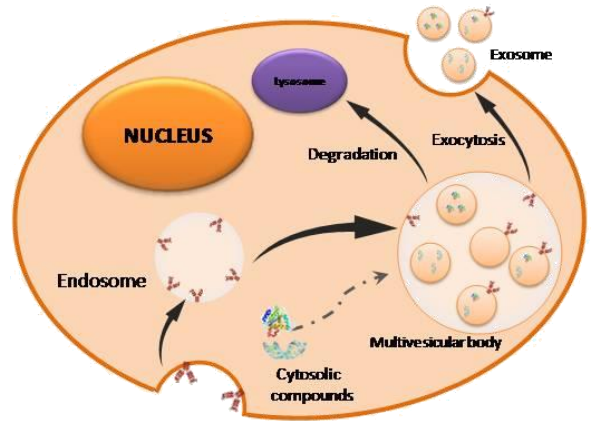
**Characterization:** UV-VIS / ICP



## EXOSOME CHARACTERIZATION

Exosomes are one the most interesting biological microvesicles due to the potential source of information contained inside these particles.

Our facilities have the highest technology such as the *Nanoparticle Track Analysis (NTA) Technology*, based on the analysis of Brownian motion, which is able to determine the **size, size distribution and the exosome concentration** in the sample.



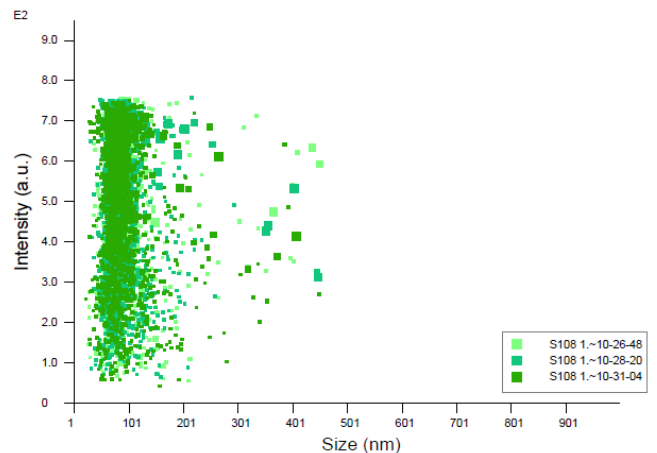
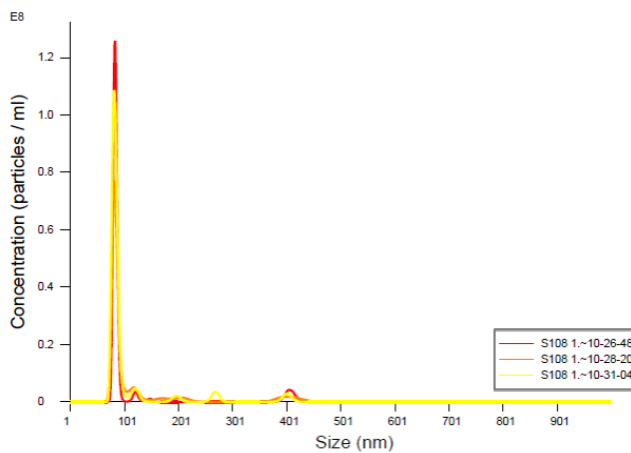
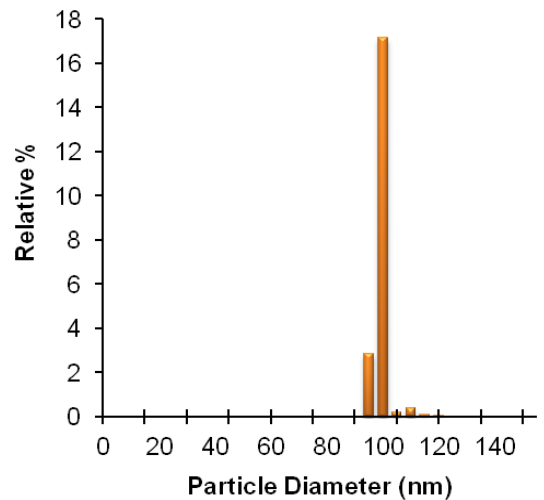
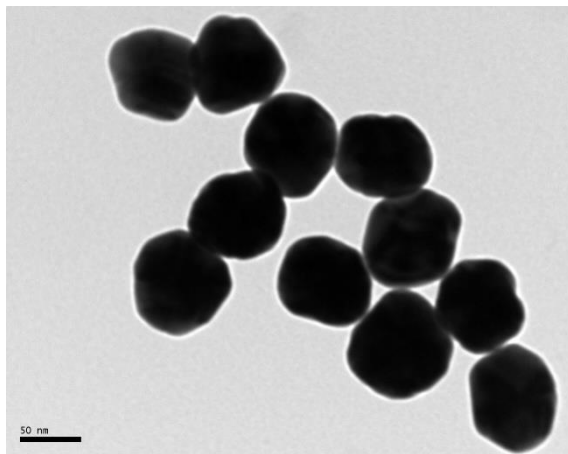
## SPECIFIC EXOSOME CHARACTERIZATION

Apart from the analysis of exosome size and concentration, NTA analysis also enabled an evaluation of a subpopulation of exosomes which possess a specific biomarkers over their surface. This goal can be achieved by using an appropriate fluorescent antibody or molecule to label the exosome of interest.

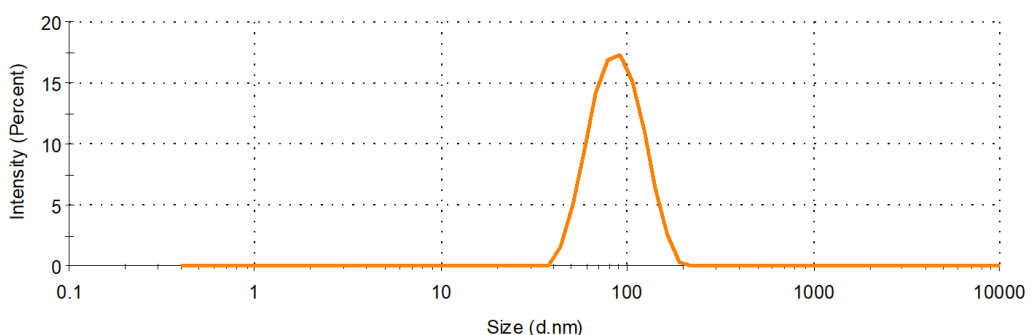
## NANOMATERIAL CHARACTERIZATION

The service is focused on the **characterization of nanomaterials (metallic nanoparticles, polymeric nanoparticles and nanovesicles, among others) as well as other similar systems** ranged from 0.3 nm to 100 μm. In addition to nanomaterial characterization, Nanovex offers personalized advice and technical assistance.

The following parameters can be determined: **Size, size distribution, Nanoparticle/Nanovesicle Concentration, Z-Potential, Morphology, Entrapment Efficiency, Structural Analysis, Fluorescence and Stability.**



Size Distribution by Intensity



**NANOVEX**

**Biotechnologies**

Parque Tecnológico de Asturias. CEEI.

33428 Llanera (Asturias) SPAIN

[www.nanovexbiotech.com](http://www.nanovexbiotech.com)

[info@nanovexbiotech.com](mailto:info@nanovexbiotech.com)

(+34) 985 98 06 05



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