cytodiagnostics

PRODUCT DATA SHEET

Gold NanoUrchins

Catalog Numbers: GU-50-XX, GU-60-XX, GU-70-XX, GU-80-XX, GU-90-XX, GU-100-XX

Description

Cytodiagnostics non-functionalized Gold NanoUrchins have unique optical properties compared to spherical gold nanoparticles of the same core diameter. The spiky uneven surface causes a red shift in the surface plasmon peak and a larger enhancement of electromagnetic fields at the tips of the Gold NanoUrchin spikes compared to that of a spherical particles.

As an example, 100nm spherical gold nanoparticles have an SPR peak at 570nm while 100nm Gold NanoUrchins have a SPR peak at around 680nm.

In addition, binding of ligands such as proteins to the Gold NanoUrchin surface causes a larger shift in the surface plasmon peak compared to standard spherical gold nanoparticles.

The citrate-covered surface of our Gold NanoUrchins allows for efficient adsorption of primary antibodies and other proteins. In addition, Gold NanoUrchins can be further modified and functionalized through ligand-exchange with e.g. thiol-containing ligands such as PEG and oligonucleotides.

These particles can be used as an alternative to standard spherical gold nanoparticles in a wide range of applications such as electron microscopy, immunostaining and development of biological sensors.

Our Gold NanoUrchins are available in 6 different sizes and have uniform size distribution (CV <12%).

For custom sizes, formulations or bulk quantities please contact our customer service department.

Features

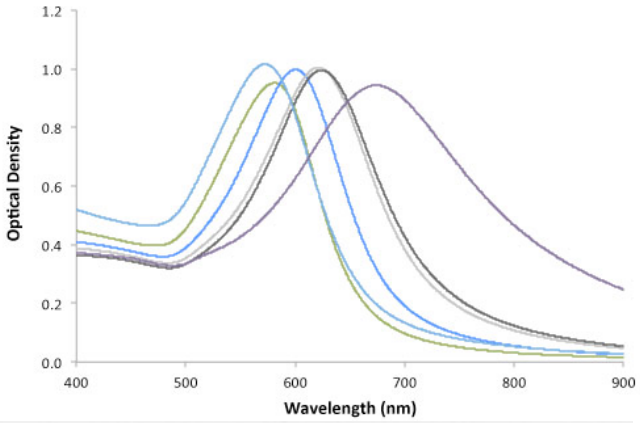
• Enhanced optical properties
• Citrate surface allows for easy ligand-exchange for further functionalization
• Readily adsorbs proteins to the surface

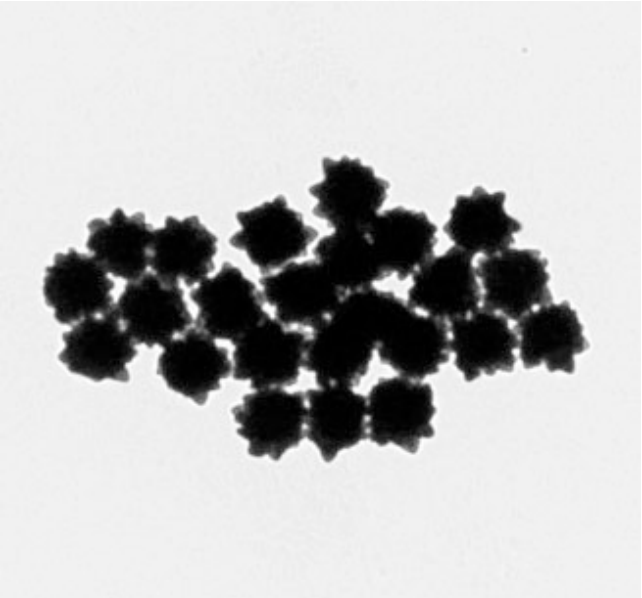
Applications

• Ideal for development of peptide and protein gold conjugates for use in applications such as blotting, lateral flow assays, LSPR assays, light microscopy, and transmission electron microscopy (TEM).

Characteristics

Core diameter: 50-100nm (Coefficient of Variance < 12%)
Polydispersity Index (PDI): < 0.20
Concentration: OD=1 (~ 0.05 mg/ml)
Absorbance (λmax): 585-680nm (core diameter dependant)
Supplied in 0.1mM Phosphate-Buffered Saline (0.01X PBS)





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Diameter (nm)	Peak SPR Wavelength (nm)	NPS/ml	Wt. Conc. (mg/ml)	Molar Ext ($M^{-1}cm^{-1}$)	Size Dispersity (+/-nm)	Particle Volume (nm^3)	Surface Area (nm^2)	Surface/ Volume Ratio	Particle Mass (g)	Molar Mass (g/mol)	Molar Conc.
50	585	3.51E+10	4.45E-02	1.72E+10	<8%	6.54E+04	7.85E+03	0.12	1.27E-15	7.64E+08	5.83E-11
60	585	1.96E+10	4.30E-02	3.07E+10	<10%	1.13E+05	1.13E+04	0.1	2.19E-15	1.32E+09	3.25E-11
70	600	1.20E+10	4.17E-02	5.03E+10	<10%	1.80E+05	1.54E+04	0.086	3.48E-15	2.10E+09	1.99E-11
80	620	7.82E+09	4.06E-02	7.70E+10	<10%	2.68E+05	2.01E+04	0.075	5.20E-15	3.13E+09	1.30E-11
90	630	5.37E+09	3.97E-02	1.12E+11	<8%	3.82E+05	2.54E+04	0.067	7.40E-15	4.46E+09	8.92E-12
100	680	3.84E+09	3.89E-02	1.57E+11	<8%	5.24E+05	3.14E+04	0.06	1.02E-14	6.11E+09	6.37E-12

* Data is approximated based upon a spherical nanoparticle. All concentrations at OD =1.

Protein Conjugation

A recommended starting protocol for conjugation of proteins to Cytodiagnostics standard gold nanoparticles can be found online at www.cytodiagnostics.com in the Technical Reference Section.

Storage

This product should be stored at 4°C. DO NOT FREEZE. If stored unopened and as specified, Cytodiagnostics gold nanoparticles are stable for at least 6 months.

Handling

When stored for a long period of time gold nanourchins may sediment at the bottom of the flask, which is especially true for larger particle sizes. Prior to use, re-suspend the sedimented particles by swirling until a homogenous solution is obtained.

To maintain optimal performance, and stability of the colloidal gold, care should be taken to use clean storage containers if using other than supplied with the product.

Washing Gold Nanoparticles

Although it is not generally necessary to wash the gold nanourchins prior to use, some applications may require additional washing procedures. The easiest way to remove possible contaminants in the nanoparticles solution is by centrifugation. Centrifugation force is dependent on size of the gold nanourchins and should be adjusted according to Table I for optimal performance.

Note I: Since non-functionalized gold nanourchins are sensitive to salt containing buffers, re-suspension should always be performed in ultra-pure water to prevent irreversible aggregation. Irreversible aggregation is characterized by a clear to bluish solution upon the addition of salt.

Note II: Please note that centrifugation can induce aggregation. To prevent aggregation it may be necessary to add Tween 20 at a concentration of 0.025% w/v.

Procedure

1. Place 1ml aliquot of gold nanourchins in a 1.5ml micro centrifuge tube.
2. Centrifuge the gold nanourchins for 30 minutes using the appropriate G force determined by referencing Table I.
3. Remove the supernatant and re-suspend in an appropriate volume of ultra-pure water.
4. Vortex to re-disperse the particles.

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Table I. Appropriate G forces for centrifugation of gold nanourchins. Note that recommended conditions are for a volume of 1ml and centrifugation using a microcentrifuge.

Size (nm)	Speed (*g*)	Time (min)
50	2,000	30
60	1,125	30
80	600	30
100	400	30

Product Safety and Handling

This product is for R&D use only, not for drug, household, or other uses. Please review the material safety datasheet (MSDS) available online for proper safety and handling procedures.

Ordering Information

For ordering call 866-344-3954 or visit us online at www.cytodiagnostics.com

Catalog Number	Description	Sizes
GU-50-XX	50nm Gold NanoUrchins	20ml, 100ml or 500ml
GU-60-XX	60nm Gold NanoUrchins	20ml, 100ml or 500ml
GU-70-XX	70nm Gold NanoUrchins	20ml, 100ml or 500ml
GU-80-XX	80nm Gold NanoUrchins	20ml, 100ml or 500ml
GU-90-XX	90nm Gold NanoUrchins	20ml, 100ml or 500ml
GU-100-XX	100nm Gold NanoUrchins	20ml, 100ml or 500ml

*Indicates quantity, e.g. GU-50-20 for 20ml of 5nm Gold Nanourchins

For custom sizes, bulk quantities, and custom gold nanourchin surface chemistry, please contact our customer service department.

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