Gold NanoUrchin Nanoparticle Conjugation Optimization Kit

Description

Passive conjugation is the traditional method of conjugating gold to a protein. The interaction occurs passively between the protein and the gold particle through van der Waals and ionic forces. Depending on the conditions, a protein can spontaneously conjugate with a gold particle.

Abvigen 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, 100 nm spherical gold nanoparticles have an SPR peak at 570 nm while 100 nm Gold NanoUrchins have a SPR peak at around 680 nm. 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%).

Our Gold NanoUrchin protein conjugation optimization kits are supplied as complete and easy to use systems for increased success rates in the development of good quality Gold NanoUrchin conjugates.

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

Website: www.abvigen.com Phone: +1 929-202-3014 Email: info@abvigenus.com

Kit Components

50 nm ~ 100 nm standard GoldNanourchins (100 ml, conc. OD1)

Conjugation optimization buffers (1.5 ml each)

10% NaCl (100 ml)

Protein resuspension buffer

Detailed conjugation optimization protocol

Each kit contains enough material to optimize 10 protein conjugates, or one optimization reaction and scale-up production of 20 ml of conjugate at a final optical density of OD3.

Characteristics

Core diameter: 50 ~ 100 nm (Coefficient of Variance < 12%)

Polydispersity Index (PDI): < 0.20

Concentration: OD=1 (~ 0.05 mg/ml)

Absorbance (λmax): 585 ~ 680 nm (core diameter dependant)

Supplied in 0.1 mM Phosphate-Buffered Saline (0.01X PBS)

Features & Benefits

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).

Storage

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

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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 1 ml aliquot of gold nanourchins in a 1.5 ml micro centrifuge tube.
2. Centrifuge the gold nanourchins for 30 min 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 1 ml 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

Notes

This product is for R&D use only, not for drug, household, or other uses.

Ordering Information

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