

Nanopartz™ Gold Nanobeads™

Nanopartz™ Gold Nanobeads™ are manufactured using our proprietary and patent pending method that results in exact sizes, and highly monodisperse sizes and shapes, and adds the advantage of a patent pending method that includes a covalent bonded polymer cage with carboxyl, methyl, biotin, or neutravidin active groups. This formulation has been optimized for *in vitro* use and provides the following benefits:



- May operate from pH= 3 to 11
- May be stored at room temperature for up to one year (accelerated testing has shown 70 C for 2 weeks)
- May operate in up to 1-2 M salt
- May be resuspended in most solvents
- May be concentrated to OD 5,000
- Charge control, +, -, or neutral

Other Benefits

- ❖ Monodisperse shapes and sizes in production volumes satisfies high volume applications.
- ❖ Tunable scattering/absorptions in the VIS region create colored gold good for multi-label diagnostics and imaging.
- ❖ Being positively charged and small lends to better intercellular uptake.
- ❖ Changing shape upon laser incidences combined with facile synthesis creates a great drug delivery vehicle.
- ❖ Low cytotoxicity means great in-vitro vehicles.

Features (Rods)

- ❖ Highly accurate and monodisperse in size, shape, and batch to batch uniformity.
- ❖ Wavelength accuracy better than 10 nm in many cases
- ❖ Size monodispersity better than 10% CV
- ❖ Greater than 95% rods, less than 5% other shapes
- ❖ Available in aspect ratios from 1.67 to 3.5, resulting in extinctions from 550 to 750 nm.
- ❖ High anisotropy.
- ❖ High non-linear coefficients. Extremely efficient for frequency conversion.
- ❖ Relative absorption to scattering contribution may be tuned by change in dimensions.
- ❖ Positively charged and extremely small (compared to other nanoparticles).

- ❖ Nanorod to sphere shape changing on high energy pulsed lasers.

Features (Spheres)

- ❖ Highly accurate and monodisperse in size, shape, and batch to batch uniformity.
- ❖ Accurate to +/- 2 nm in diameter.
- ❖ Size monodispersity better than 4% CV for many sizes.
- ❖ Greater than 99.9% spheres.
- ❖ Carboxylic acid capping agent is reduced to < 0.1% without adverse effects to the spheres.
- ❖ Extremely stable. Shelf life is greater than one year. May be stored at room temperature for extended periods.
- ❖ The light scattering power of a 60 nm gold particle is equivalent to ~5 X 10⁵ fluorescein molecules.
- ❖ AccurateTM SGNPs do not photobleach.
- ❖ Light scatter can be detected by the unaided eye at particle concentrations as low as 10⁻¹⁵ M (femtomolar) in suspension and as low as 0.005 particles/nm² on a transparent surface.
- ❖ Individual gold nanoparticles can be seen by eye in an inexpensive student microscope with simple dark field illumination allowing for very sensitive and inexpensive particle counting assays.
- ❖ Different sized particles scatter different colors of light and therefore can be used as multicolor multiplexed labels.
- ❖ Facile conjugations allow for coating of antibodies, receptors, ligands, DNA without affecting their light scattering properties.
- ❖ Slightly negatively charged (reduced aggregation).
- ❖ Facile synthesis. Gold chemistry is well known.
- ❖ No known cytotoxicity. Gold is FDA approved for rheumatoid arthritis.

Applications

Life Sciences

In-Vitro

- Imaging
 - Dark Field Microscopy
- Diagnostics
 - Heterogeneous
 - SERS
 - Dark Field Microscopy
 - Lateral Flow
 - Homogeneous
 - Fluorescence Quenching
 - SPR