All About Nanopartz Fluorophore Labeled Gold Nanoparticles

Overview

Nanopartz Fluorophore Labeled Gold Nanoparticles include the entire line of gold spheres, rods, microgold, and nanowires functionalized with fluorophores. Some of the advantages of fluorophore functionalized gold nanoparticles include:

1. The ability to measure both extinction and fluorescence from the same label
2. Better in vivo circulation than other labels (bare fluorophores)
3. Better cell uptake capabilities
4. The ability to load additional payloads
5. Fluorescence enhancement due to gold nanoparticle surface plasmon

These advantages create a number of opportunities for the in vivo as well as in vitro researcher. Some of the challenges to fluorophore functionalized gold nanoparticles include:

1. Fluorescence self quenching due to the gold nanoparticle surface plasmon
2. Extinction due to group effects - i.e. fluorescence signal from one label suffers extinction from the gold effect of an adjacent label

FAQz

Do you measure the number of fluorophores on each nanoparticle?

No. Because the effects of the fluorescence are strongly based on the fluorophore excitation and emission, gold nanoparticle extinction, and distance between the fluorophore and the gold nanoparticle, it is impossible to measure the exact number.

What is the best concentration to work with?

For fluorescence spectrometers, we have found the best concentration is OD=0.25. For confocal fluorescence spectrometers we think single label measurements work best.

Which instruments work best?

Confocal fluorescence spectrometers work extraordinarily well. If you are using a non-confocal fluorescence spectrometer, 180 degree scattering collection is best when the concentration is >OD1, 90 degree scattering collection when the concentration is below this.

Do I choose a nanoparticle with an extinction that overlaps or is separate from the fluorophore excitation/emission wavelengths?

For fluorescence spectrometers we recommend a good deal of separation. For example our 100nm spherical gold nanoparticles with a FITC (488nm) label. For confocal we recommend an overlap between the gold nanoparticle extinction and the excitation/emission of the fluorophore. An example of this is our 50nm spheres with a CY3 fluorophore.

What are your favorite combinations?

Our favorite combinations for general use are: 100nm spherical gold nanoparticle with a 488 fluorophore and a 15nm sphere with our Rhodamine fluorophore.

I am having trouble measuring fluorescence from my fluorescence spectrometer, what do I do?

If you are using a confocal fluorescence spectrometer, this should not be an issue. For a regular fluorescence spectrometer, make sure your instrument can measure the level of fluorophores that you are analyzing. That is, typically fluorophore spectrometers measure micromolar concentration. The gold nanoparticles come at picomolar concentration, one million times less concentrated. However many spectrometers can measure in nanomolar or picomolar. Please try using this concentration of the same or similar fluorophores and make sure your instrument is capable of measuring at this level.

What is the construct of this product?

This product is a gold nanoparticle with a plasmon enhancement layer that then attaches to the ligands and fluorophores.

Storage and Handling

Once received, place and keep in a darkened refrigerator until ready to use. When ready to use, please use the solution that best fits your functionalization. For example, for a streptavidin functionalized nanoparticle, resuspend in PBS. For a carboxyl, resuspend in MES, and so forth. In general, for all functionalized nanoparticles, salt concentrations greater than 10mM are best.

It is typical for there to be some agglomeration upon resuspension. Please go here:

https://www.nanopartz.com/gold-nanoparticles-sonication.asp

To check the health of the solution, the best way is to measure via UV VIS and match the specifications that were given with the COA.

Please be aware of the functionality of the nanoparticle and the reactive time this reactant provides. For example, for NHS the half life is 1 hour in PBS. For carboxyl, they are stable for more than six months.

Further Questions

For further questions, please contact our technical support at:

https://www.nanopartz.com/submit_support_request.asp

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