NANOBINDI TECHNOLOGY

NanoBindi - Brightly glowing nanoparticle with Core-Shell Architecture

NanoBindis™ are fluorescent nanoparticles that have a fluorescent dye as a core in a silica shell to ensure photostability, low cytotoxicity and high sensitivity for biological applications. These nanoparticles have possible applications in sensors, microarrays, process analytical chips and biological imaging. NanoBindis are ideally suited for use in many fluorescence-based detection schemes, including: *fluorescence microscopy; flow cytometry; in vitro and in vivo molecular interactions (protein-protein, protein-DNA and ligand-receptor); immunofluorescence; Western blot; ELISA; and multiplexed detection.* Avanti NanoSciences' NanoBindi technology offer an attractive alternative to quantum dots because of their greater chemical inertness, direct measurements and reduced cost.

Key Features

BIOSTABILITY – NanoBindis offer excellent biostability in aqueous environments, and are sold with a minimum shelf life guarantee of twelve (12) months stored at 4 ° C.

SMALL SIZE – By means of our novel surface derivatization process, NanoBindis in all colors are <15 nm diameter in size.

[*Size determinations were made using (1) a TEM facility and associated instrumentation. and (2) Zetasizer Nano ZS dynamic light scatter instrumentation, Malvern Instruments.*]

PHOTOSTABILITY – NanoBindis are resistant to photo bleaching

NON-CYTOTOXIC – NanoBindis are non-cytotoxic for their intended use.

EXCITATION– NanoBindis can be excited using standard sources (405nm violet laser, 488nm argon laser, 365 nm UV lamp or mercury arc lamp). The optimal excitation wavelength for all BioPixel colors is 405nm, but any wavelength of light below 500nm can be used to excite crystals with emissions of 520nm or higher.

NARROW EMISSION SPECTRA – NanoBindis in all colors have narrow, non-overlapping emission spectra, with FWHM values that generally fall in the 30-35 nm range.

CHEMICAL STABILITY – NanoBindis are usable in a wide range of buffers and pH values (5 to 10).

FLUORESCENCE LIFETIMES – Fluorescence lifetimes are an order of magnitude longer than conventional organic dyes and greater than the autofluorescence lifetime of biological molecules.

SURFACE CHEMISTRY – NanoBindis are derivatized with carboxyl functional groups on their surface to make them suitable for further binding to biologically relevant molecules.

WHY NANOBINDIS ARE UNIQUE

Three essential characteristics differentiate NanoBindis from other types of fluorescent nanocrystals:

1. The tiny size of NanoBindis facilitates their diffusion and cellular permeability, therefore maximizing labeling efficiency and resolution of molecular targets, and minimizing steric hindrance in complex settings, e.g., ligand-receptor binding studies;
2. The enhanced chemical stability of NanoBindis is a major factor in their adaptability for use in a broad range of environmental conditions
3. Their biostability contributes to their versatility for use in many types of fluorescence-based detection schemes.

NanoBindis are functionalized fluorescent silica-based nanoparticles with properties that make them more useful than traditional organic fluorophores in many types of fluorescence-based assays. NanoBindis are uniform in size, physically small (25-50 nm), with unsurpassed brightness and exceptional stability in aqueous environments.

NanoBindis™

- Resist photobleaching and offer excellent biostability in aqueous environments
- Are functionalized to allow direct coupling to biological molecules such as proteins, antibodies, lectins and nucleotides
- Produce high resolution imaging due to their small size (<50 nm diameter)
- Are functionally stable for >12 months at 4 °C
- In multiple colors of the visible spectrum can be simultaneously excited using a single light source
- Are usable in a wide range of buffers and pH values
- Are well suited for the rapidly growing automated biological assay market where the ability to generate multiple color markers simultaneously is strongly desired