

Core-Shell Nanoparticles, Method for Synthesis, and Use in Biomarker Detection

Applications: **Cell surface biomarker detection and quantification.** Blood phenotyping. Quality control assays for cellular therapy products. Labeling of cell populations before flow-activated cell sorting.

Commercial Interest: Businesses commercializing cell labeling reagents and contrast agents for detection by fluorescence microscopy, confocal microscopy, dark-field optical microscopy, transmission electron microscopy, or flow cytometry. Nanoparticulate product suppliers. Blood bank reagents suppliers.

Summary: This technology focuses on core-shell nanoparticles made up of a silver core and a functionalized silica shell. The method for nanoparticle synthesis is simple, affordable, and can be easily scaled up. Synthesis yield is high, nanoparticle size is homogeneous, and nanoparticles are chemically stable. Silica shell functionalization allows to incorporate fluorescent tags as well as ligands (antibodies, Fab, scFv, cytokines, peptides, synthetic ligands) that are specific to antigens, receptors, or cell surface proteins. The use of nanoparticles allows **to substantially enhance fluorescence emission, thereby conferring a sensitivity level that is much higher than that of conventional fluorescent ligands.** Furthermore, binding between ligand-coupled nanoparticles and target cells is detectable using various microscopic techniques (fluorescent, confocal, transmission electron, dark-field optical) and by flow cytometry. The technology is also amenable to multiplex analysis. **Finally, nanoparticles allow to detect weakly expressed blood group antigens on the surface of red blood cells.**

Intellectual Property: A provisional patent application has been filed in the United States for this invention.

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Information about this technology for licensing purposes can be obtained from :

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