Dean A Eckhoff, Jason D B Sutin, Elena V Rogozhina, Jeffrey N Stuart, Nynke H Dekker, David Bensimon, Jonathan V Sweedler, Munir H Nayfeh, Paul V Braun, and Enrico Gratton.

Preparation and characterization of a silicon nanoparticle / DNA conjugate.

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Abstract

This work studies the fluorescence properties of group IV semiconductor nanoparticles (Si-np and Ge-np). The primary goal is to assess their potential for use as a fluorescent marker in biological applications. Our current emphasis is with carboxyl functionalized Si-np as they are well suted for conjugation with a wide range of biomolecules. These particles were covalently attached to an oligonucleotide, further substantiating the functionalization and labeling reactions for this system. Strong fluorescence is seen from the labeled DNA, but it is accompanied by a substantial red-shift and broadening of the emission. Experiments aimed at understanding these changes and further characterizing the Si-np/DNA conjuagate will be presented. We will also discuss our projects with Ge-np and Si-np/streptavidin linking.