## Abstract Submitted for the MAR06 Meeting of The American Physical Society

15nm diameter upconversion nanophosphors as bio-labels. SHUANG FANG LIM, ROBERT RIEHN, CHIH-KUAN TUNG, ROBERT H. AUSTIN, Department of Physics, Princeton University, NORA KHANARIAN, University of Pennsylvania, WILLIAM S. RYU, DAVID TANK, Lewis-Sigler Institute for Integrative Genomics, Princeton University — We have synthesized 15 nm diameter yttrium oxide based nanophosphors that are capable of visible to infrared upconversion. We show that these phosphors can be used for dual-mode imaging of biological systems by observing visible emission under both infrared excitation, and electron excitation in a scanning electron microscope. We have investigated the optical properties, confirmed the 2-photon nature of the upconversion process, and verified that similar narrow band emission spectra are obtained under electron and infrared excitation. We will also report on progress in surface functionalization for targeted bio-labeling . We demonstrate that biocompatibility is sufficient for in-vivo imaging in the nematode worm C. Elegans, and locate phosphors with high spatial resolution using energy dispersive X-ray imaging in scanning electron microscope.

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Date submitted: 16 Jan 2006

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