1098-78-91 **Ge Wang*** (wangg6@rpi.edu), Biomedical Imaging Center, BT 3209, RPI, 110 8th Street, Troy, NY 12180. *Micro-modulated Luminescence Tomography.* Preliminary report.

Imaging depth of optical microscopy has been fundamentally limited to millimeter or sub-millimeter due to multiple scattering of light in a biological sample. X-ray microscopy can resolve spatial details of few microns deeply inside a sample but contrast resolution is inadequate to depict heterogeneous features at cellular or sub-cellular levels. To enhance and enrich biological contrast at large imaging depth, various nanoparticles become essential to basic research and molecular medicine. Nanoparticles can be functionalized as imaging probes, similar to fluorescent and bioluminescent proteins. Recently, LiGa5O8:Cr3+ nanoparticles were synthesized to facilitate luminescence energy storage with x-ray pre-excitation and subsequently stimulated luminescence emission by visible/near-infrared (NIR) light. In this talk, we propose a micro-modulated luminescence tomography (MLT) approach to quantify a nanophosphor distribution with or without energy storing characteristics in a thick biological sample with high resolution. Our numerical simulation studies demonstrate the feasibility of the proposed approach. (Received January 14, 2014)