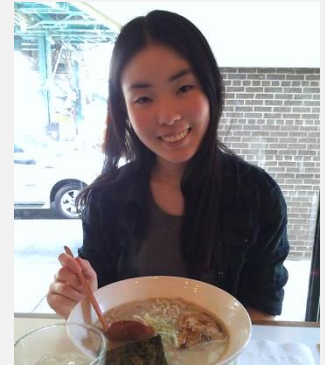


# Moments in Materials Presentation: **Lanthanide Doped Upconverting Nanoparticles**

Speaker: Leslie Hamachi

When: Thursday, June 26<sup>th</sup> 2014, 4:30 p.m.

Where: NWC, 7<sup>th</sup> floor meeting room, RM 703



Conventional photoluminescence imaging of biological samples has been accomplished using organic dyes, fluorescent proteins, and semiconductor quantum dots with Stokes-shifted emissions using excitations in the ultraviolet or blue-green visible spectral ranges. However, these fluorescence excitation wavelengths are not optimal due to induced scattering and autofluorescence of biological tissues as well as high cytotoxicity. Lanthanide doped nanoparticles solve many of these imaging problems by utilizing sequential absorptions of multiple photons in the process of upconversion to absorb near-infrared wavelengths of light with anti-stokes shifted emissions in the visible spectrum. In this literature talk, I will describe upconversion mechanisms, synthetic schemes motivated by the electronic structure of lanthanide dopants, and survey their current bioimaging and therapeutic applications.

Selected references:

*Chem. Rev.*, 2014, 114 (10), 5161–5214. *Sensors*, 2012, 12, 2414–2435.

