



Multi-Modal and Multi-Functional Magnetic Particles for Cancer Imaging

Adeel Ahmad, M-CNTC Trainee

Adeel is a 5th Year PhD student in the Department of Electrical and Computer Engineering at the University of Illinois at Urbana-Champaign

Date: Tuesday, October 4, 2011

Time: 12:00 – 12:20 p.m. CDT (10:00 – 10:20 a.m. PDT)

Location: 1000 MNTL at Illinois (KL 232 at UC Merced)

Abstract:

Iron oxide magnetic nanoparticles (MNP's), due to their small size, unique magnetic properties and the ability to manipulate these remotely, are promising materials for diagnostic, imaging, and therapeutics in biomedical applications. In this presentation, we describe the fabrication, characterization and some applications of protein-shell microspheres embedded with MNP's in their cores. These magnetic microspheres have been functionalized to target the $\alpha v\beta 3$ integrin receptors that are known to be overexpressed in tumors and atherosclerotic lesions. An external magnetic field can be used to perturb these particles and the resultant displacements can be optically measured with nano-scale accuracy using magnet-motive optical coherence tomography (MM-OCT) to provide not only dynamic contrast in imaging but to also assess the biomechanical properties of the microenvironment. Preliminary results demonstrate tracking in vivo dynamics of these functionalized microspheres by using fluorescence imaging followed by ex vivo MM-OCT. Ongoing research includes studying the targeting and binding efficiency of these particles under flow conditions.

Seminar Presented by:

