Magnetic Nanoparticles for Biomedical Applications

Date: 25th January 2008 (Friday)
Time: 12:00pm to 1:00pm
Venue: Block EA #02-11

Abstract

Fe$_3$O$_4$ nanoparticles are emerging as promising candidates for drug delivery and biomedical imaging applications due to their ultra-fine sizes, biocompatibility and superparamagnetic properties. However, there is huge demand to synthesize high quality (well crystalline, monodisperse, phase pure, size and shape controlled) Fe$_3$O$_4$ nanoparticles using a cheap, simple and single step method. Also, there are most common problems when applying these particles for in vivo applications: their destabilization due to the absorption of plasma proteins and non-specific uptake by reticular-endothelial system (RES), like macrophage cells. Therefore, the particles will be removed from the blood circulation system and lose their function quickly, leading to dramatic reduction in efficiency in nanoparticle based diagnostics and therapeutics. We are working for a facile synthesis of high quality, relatively smaller size (10-20 nm) and hydrophilic Fe$_3$O$_4$ nanoparticles to prolong circulation times and enhance therapeutic effects. Ligand or biomolecules will be further conjugated to the surface of the nanoparticles for specific biomedical applications.

Mr. Dipak Maity has received his Bachelor degree in Chemical Technology with Ceramic Engineering Specialization from Calcutta University, India in 2002 and obtained his Master degree in Materials Science & Engineering from Indian Institute of Technology, Kanpur, India in 2004. Now he is doing Ph.D. on “Magnetic Nanoparticles for Biomedical Applications” under the guidance of Associated Professor Ding Jun and Dr. Xue Jun Min in the Department of Materials Science & Engineering, NUS.

All are Welcome!