SINAM NANO SEMINAR

Center for Scalable and Integrated Nano Manufacturing (SINAM) presents

SINAM
CENTER FOR SCALABLE AND INTEGRATED NANOMANUFACTURING

Protein and Biomembrane Studies via Atomic Force Microscopy

Dr. Albert Jin
Laboratory of Bioengineering and Physical Science (LBPS)
National Institute of Biomedical Imaging and Bioengineering

Friday, February 8, 2008
4:00 - 5:00 PM
3110 Etcheverry Hall

Abstract

We have over the years incorporated several leading atomic force microscopy (AFM) platforms and extended their functionalities with multimodal characterization tools such as total internal reflection fluorescence (TIRF) microscopy and Raman spectroscopy in a dedicated biological AFM facility at NIH. Furthermore, some new schemes of AFM and related analyses have been developed to investigate a range of biological membrane and other macromolecular systems that are biomedically important and fascinating to investigate at nanometric and microscopic scale. As an example, for clathrin-membrane complexes in receptor-mediated endocytosis central to subcellular trafficking and cellular communication, we have resolved by high resolution imaging variable nanoscale topographic profiles of single triskelia, triskelion dimers, and a variety of clathrin assemblies with well visualized lattice structures. Single-organelle measurements by atomic force-volume and force spectroscopy reveal considerable detail and variability in internal mechanics and energetics of clathrin lattices. Other results including phase transitions in multi-component lipid bilayers and protein unfolding also demonstrate AFM as a versatile tool for biomedical imaging and nano- characterization. This seminar aims to encourage new applications of emerging nanotechnologies toward biomedical solutions.

Dr. Albert Jin is a Staff Scientist at the Laboratory Bioengineering and Physical Science (LBPS), National Institute of Biomedical Imaging and Bioengineering, National Institutes of Health, where he has been since 1992. Dr. Jin received his B.S. degree in physics from the Nanjing University in China in 1985, M.Sc. Degree in experimental physics from the Penn State University in 1988, and Ph.D. degree in theoretical physics from the University of Maryland at College Park in 1992. At NIH, his researches involve mostly structural functional studies of biological membranes, subcellular organelles, muscle and parasitic proteins, and the like. His current focus is on nanotechnology, instrumentation around atomic-force and optical imaging and spectroscopy, and research applications toward biomedical problems.

Refreshments Provided

Hosted By: Professor Xiang Zhang, 3112 Etcheverry Hall
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