Jiji Chen was born at Shaoyang, Hunan of China. He studied clinical medicine in XiangYa School of Medicine, Central South University and received M.D. degree in 2004. Then he obtained his master degree from department of biomedical engineering at 2007. Jiji Chen joined Dr. Joseph Irudayaraj's group at Purdue University from 2007 and studied intracellular trafficking of gold nanorods with cancer therapy, epigenetic modification in single live cell using advanced single molecule fluorescence techniques and non-linear microscopy. In the spring of 2011 he graduated from Purdue with a Ph.D degree

Agricultural & Biological ENGINEERING

Thesis Defense

Speaker: Jiji Chen

Title: SINGLE MOLECULE FLUORESCENCE SPECTROSCOPY AND MICROSCOPY FOR EPIGENETIC MODIFICATION

Major Professors: Dr. Joseph Irudayaraj

Date: April 6, 2011

Time: 9:00 am

Place: ABE 212

Abstract:

Epigenetics plays a fundamental role in the development and differentiation of cells and has become one of the most attractive and active research fields. My Ph.D work develops advanced single molecule fluorescence spectroscopy and microscopy tools to evaluate histone modifications in vitro and in vivo which provide a new dimension to epigenetics research and deep understanding of how the modification patterns contribute to chromatin structure as well as their dynamics during gene regulation. We found that histone modifications do not occur independently but more likely in a combinational pattern. We were the first to reveal the stoichiometry of histone proteins in single nucleosomes. By developing a novel method to target histone modifications in living cells, we will have the opportunity to assess the effect of histone modifications in gene transcription. These explorations have the potential to revolutionize our understanding of gene regulation. The technologies I have developed and established here, not only opens up new opportunities in studying biomolecules interaction at single molecule sensitivity but also provides unprecedented possibilities to biology and medicine.