

Fall 2007 SEMINAR SERIES

F21C Bioprocessing & Biosensing Center

DIVISION OF FOOD SYSTEMS & BIOENGINEERING

PRESENTER: **Dr. Yu-Zhong Zhang, Senior Scientist**
Invitrogen/ Molecular Probes, Eugene, Oregon

TITLE: **Fluorescent Nano & Microparticles & Their Application
in Flow Cytometry & Live Animal Imaging**

ABSTRACT:

Flow cytometry and live animal imaging have become exciting approaches with rapidly expanding potential for biological, medical, and pharmaceutical fields. Flow cytometers are designed to perform quantitative measurements on individual cells and other particles with high precision, speed, and accuracy. Researchers today are trying to maximize the information that they get out of flow cytometry experiments by looking at more parameters in one sample. Qdot[®] nanocrystals provide a powerful way to multiply fluorophore selection using available excitation sources. Nanocrystals can be excited with UV or violet light sources as well as longer wavelength. The resulting emissions are bright with long effective Stokes shifts. The emission peaks are symmetrical and relatively narrow even with sub-optimal excitation at 488 and 635 nm. Nanocrystals provide better population resolution than is achieved with most organic fluorophores or tandem dyes.

Exciting achievements in live animal imaging were obtained by using some of newly developed Qdot[®] nanocrystals and organic dye-embedded polymer nanospheres. These fluorescent particles, as contrast agents, demonstrated excellent preferential accumulation in target tissue and reached sufficient signal-to-noise ratio to yield satisfactory image resolution. The data indicated that these nanoparticles can be very useful for non-invasively detecting and monitoring various disease states in live animals. In another intravital imaging based research, fluorescent polymeric nanoparticles with special physical and chemical properties were used for blood flow regulation related studies. Scientists used these particles as intravascular tracers to monitor and record blood flow velocity change in microcirculations and obtained needed information for medical research and drug development.

BIOGRAPHY:

Dr. Yu-Zhong Zhang is a senior scientist at Invitrogen/Molecular Probes in Eugene, Oregon. In this role, he currently specializes in development of multi-color fluorescent microspheres and quantum dot nanocrystals bioconjugates used for confocal microscopy, intravital imaging, high content screening and flow cytometry.

Dr. Zhang joined Molecular Probes in 1990 focusing on the development of fluorescent labeling reagents for molecular and cell biology. Prior to joining Molecular Probes, he pursued postdoctoral training in molecular biology at the University of Oregon. Dr. Zhang currently holds a total of 14 U.S./U.K. patents, with an additional three patents pending. He has also published 35 peer-reviewed journal articles.

Dr. Zhang earned his M.S. degree in biochemistry from Graduate School of Chinese Academy of Sciences, and a Ph.D. degree in structural biology from the University of Oregon.

DATE • TIMES • LOCATIONS:

Tuesday, Sept. 25th, 11:00 am • Monsanto Auditorium • Refreshments

ALSO Tuesday, Sept. 25th, 4:00 p.m. for meetings with students, 105 AEB • Refreshments