

Food for the Twenty-First Century
Bioprocessing and Biosensing Center

Fall 2009 Seminar Series

PRESENTER: Dr. Venumadhav R. Korampally, Research Assistant Professor
University of Missouri, Center for Micro/Nano Systems and Nanotechnology

TITLE: Novel Nanostructured Organosilicate Films and Their
Applications in Sensing and Medical Imaging

ABSTRACT:

Nanoporous materials have become indispensable in many fields ranging from photonics, catalysis and semiconductor processing to biosensor infrastructure. Rapid and energy efficient fabrication of these materials is, however, nontrivial. We have developed a novel technique to for the rapid fabrication of these materials from colloidal dispersions of Polymethyl Silsesquioxane nanoparticles. Nanoparticle – polymer composites above the decomposition temperature of the polymer are examined and the entropic gain experienced by the nanoparticles in this rubric is harnessed to fabricate novel highly porous films composed of nanoparticles. Optically smooth, hydrophobic films with low refractive indices (as low as 1.048) and high surface areas (as high as 1325 m²/g) have been achieved with this approach. These films are currently being investigated as high surface area biosensor platforms and coatings for novel photonic structures. Dye doping of the nanoparticles results in extremely photostable particles that can be easily functionalized for biomedical imaging.

BIOGRAPHICAL:

Dr. Venu Korampally obtained his Ph.D degree in Electrical engineering from MU in 2007. His Ph.D dissertation was in the area of Nanoporous dielectrics and MEMS and integration of these two technologies to fabricate novel sensors. After working as a post doctoral research associate from 2007 to 2008, he is currently employed as a research assistant professor at MU in the Center for Nano/Micro Systems and Nanotechnology. His current research focus is on the development of novel nanostructured materials for chemical, biological sensing, biomedical imaging and drug delivery.

DATE • TIME • LOCATION:

September 15, 2009, 4:00 PM, 105 Agricultural Engineering Building

The Food for the 21st Century (F21C) program at the University of Missouri (MU) was established in the mid-1980's through state funding. The overall goal of the program is to help Missouri food producers and processors maintain their competitive edge in the global marketplace by conducting cutting-edge research in a number of food-related areas. The program involves faculty researchers from multiple colleges including College of Agriculture, Food and Natural Resources; College of Arts and Sciences; College of Engineering; School of Medicine; College of Human Environmental Sciences; and College of Veterinary Medicine. Based on the research emphases, the researchers are grouped into four Clusters: Plant Biotechnology; Animal Reproduction; Bioprocessing and Biosensing Center; and Human Nutrition.

Bioprocessing and Biosensing Center was formed in 1986. The Center currently consists of 27 faculty members, plus collaborators, support staff, and graduate students from six departments in the College of Agriculture, Food and Natural Resources and College of Engineering. These departments include Biological Engineering; Food Science; Animal Sciences; Chemical Engineering; Electrical Engineering; and Mechanical and Aerospace Engineering. This seminar is one of the educational activities in the Bioprocessing and Biosensing Center.

Cluster Co-Leaders: Drs. Fu-hung Hsieh and Jinglu Tan

Department of Biological Engineering, 254 Ag Eng, 1406 E. Rollins Street, Columbia, MO 65211-5200

Phone: 573.882-7044 **Fax:** 573.882.1115

For More Information: Linda Little (573-882-7044)

F21C Seminar Web: <http://fsb.missouri.edu/seminars/>

Dept. of Biol. Eng. Web: bioengineering.missouri.edu/