Purdue University

SCHOOL OF CHEMICAL ENGINEERING
GRADUATE SEMINAR SERIES

Dr. Mary L. Kraft
Assistant Professor of Chemical & Biomolecular Engineering
University of Illinois, Urbana-Champaign

"Chemical imaging of lipid organization in model and cellular membranes"

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3:30 - 4:30 p.m.
FRNY G140

ABSTRACT:

Compositionally distinct lipid microdomains in the cellular plasma membrane seem to play functional roles in cell signaling, adhesion, and virus budding. Because these cellular processes are involved in disease, characterizing these domains is the focus of much research. Yet, imaging the lateral distributions of specific lipid species and cholesterol in the plasma membrane with chemical specificity and at the 50 – 200-nm-lateral resolution that is relevant to cell membrane organization is currently a major challenge. Secondary ion mass spectrometry (SIMS) enables imaging the lipid distribution within model and cellular membranes with chemical specificity, but improvements in the lateral resolution and sensitivity are required to clearly detect membrane microdomains. I will present recent results on the use of a high-resolution SIMS approach that is performed with a Cameca NanoSIMS for imaging the lipid organization in phase-separated model membranes. The extension of this technique to visualizing the distributions of specific lipid species within the plasma membranes of intact cells will also be presented.

BIO:

Professor Mary Kraft received a B.S. in Biochemistry from the University of Illinois at Chicago, and a Ph.D. from the Department of Chemistry at the University of Illinois at Urbana-Champaign. She then completed postdoctoral studies with Professor Steven Boxer at Stanford University. Mary began her academic career as an assistant professor in the Department of Chemical and Biomolecular Engineering at the University of Illinois in Urbana-Champaign in 2007. She also is an affiliated member of the Department of Chemistry and the Center for Biophysics and Computational Biology. Her research focuses on the development of high-resolution compositional imaging techniques that are used to investigate the lipid organization and phase separation in model and cellular membranes.