

# *Kent State University*

## *Physics Colloquium*

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**BIOPHYSICS**  
**UNIVERSITY OF MICHIGAN**

**PHASES AND FLUCTUATIONS IN  
BIOLOGICAL MEMBRANES**

### **Abstract**

The thermodynamic properties of plasma membrane lipids play a vital role in many functions at the mammalian cell surface. Some functions are thought to occur, at least in part, because plasma membrane lipids have a tendency to separate into two distinct liquid phases. We propose that these lipid mediated functions occur because plasma membrane composition is tuned close to a miscibility critical point at physiological temperature. This hypothesis is supported by our observations of micron-sized and dynamic critical composition fluctuations in isolated plasma membranes near room temperature. In this talk, I will discuss our ongoing efforts to probe for the existence and consequences of criticality in the plasma membranes of intact cells. These recent efforts include using quantitative super-resolution fluorescence localization microscopy to monitor the organization of plasma membrane proteins in B cell lymphocytes. We also have identified a range of perturbations which alter both the magnitude of fluctuations in isolated vesicles. Some of these perturbations are also well characterized general anesthetics, and I will present some preliminary evidence suggesting that some aspects of anesthetic function may be attributed to lipid heterogeneity.

**THURSDAY, OCTOBER 29, 2015**

**1:30 PM**

**SMITH HALL 111**

**REFRESHMENTS: 1:15 PM – SMITH HALL LOBBY**