



Department of Biomathematics Seminar Series:  
Frontiers in Systems and Integrative Biology

BIO  
MATH

## Multi-Scale Dynamics of Calcium Signaling in Cardiac Myocytes



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Professor

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**Thursday, November 5, 2015  
4:00 PM**

**A2-342 MDCC, Moss Auditorium  
Marion Davies Children's Clinic**

### ABSTRACT:

Intracellular calcium (Ca) signaling is a ubiquitous signaling process in biology, regulating biological functions from life to death. Besides biological signal transduction, Ca is required for muscle contraction and plays a key role in generating both normal and abnormal cardiac rhythms. Our group uses mathematical modeling, computer simulation, experiments, as well as nonlinear dynamics to investigate the dynamics of Ca signaling in cardiac myocytes. In this talk, I will present the novel mathematical theories we developed recently for: 1) termination and duration of Ca sparks; 2) transition from random Ca sparks to waves and whole-cell oscillations; and 3) genesis of arrhythmogenic Ca alternans. I will present experimental results in debate for each topic, and show how our theories can reconcile and unify these seemingly contradictory experimental observations.

Host: Mary Sehl, M.D., Ph.D.

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