



# JOHNS HOPKINS

## BIOMEDICAL ENGINEERING



**Monday, December 8, 2008, 1:00 PM, Ross G007**

Light lunch will be provided at 12:00



## **Structural Basis for Activation and Inactivation Gating in K<sup>+</sup> Channels**

**Eduardo Perozo, Ph.D.**

Professor

Department of Pediatrics

Institute of Molecular Pediatric Sciences

The University of Chicago

Host: Dr. David Yue

**Abstract:** We aim to understand the molecular mechanisms of gating in voltage-dependent channels, by focusing on the analysis of K<sup>+</sup> channel gating in prokaryotic systems. Specifically we will address the following key questions: What are the molecular entities determining channel activity? How energy is transduced into protein motion? How different parts of the channel interact to define open channel activity? We plan to study these problems by combining spectroscopic techniques (EPR NMR and Fluorescence), X-ray crystallography and electrophysiological methods.

Here we will discuss a series of new crystal structures of the K<sup>+</sup> channel KcsA, trapped in a multiple functional conformations that include the open/conductive and open/inactivated states, as well as a number of partial opening conformations. These structures, together with functional spectroscopic and computational data have defined the molecular basis of activation and inactivation gating in KcsA, and the coupling between the inner bundle gate and the selectivity filter. Our results clearly demonstrate that in KcsA, and most likely other K channels, a variety of gating transitions are determined by the conformational dynamics at the selectivity filter.

**For more information call 410-516-7903**

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