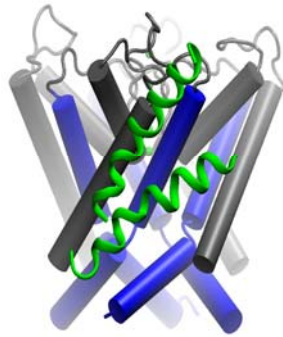


Systems Biology Interest Group Presentation

Michael Grabe, Ph.D
University of Pittsburgh
Department of Biological Sciences

How Does Voltage Open and Close Potassium Channels?



Abstract:

Voltage-gated ion channels underlie the generation of action potentials in excitable systems and trigger transmitter release and muscle contraction. Charged residues in these channels sense changes in the membrane electric field, thereby driving the channel between open and closed conformations. A wide range of experimental techniques have been used to study these proteins, including electrophysiological recordings, genetics, fluorescence techniques, and X-ray crystallography; yet, there is no consensus on their mechanical operation.

In this seminar, the physics of voltage sensing and the constraints that both mathematical models and detailed molecular models place on the prevailing experimental views of how these channels work will be discussed. In addition, a molecular model of the down state of the voltage sensor that was constructed from structural restraints obtained from a high-throughput yeast screen in combination with computational analysis will be described. Comparisons of this down state model to the Kv1.2 crystal structure in the up state provide insights into the mechanism of voltage gating.

Tuesday, December 12, 2006

4:00 – 5:00 PM

Room 6014 Biomedical Science Tower 3

French Pastries, Coffee and Juice will be served!