# Distinguished Lecture Series in Physiology

## Physiology and Membrane Biology

**University of California, Davis**


# Christopher A. Ahern, Ph.D.

Department of Molecular Physiology and Biophysics
Carver College of Medicine, University of Iowa


## "Taking a chemical biology approach to voltage-dependent ion channel gating: encoding discovery with atomic mutagenesis"


The Ahern laboratory has a long-standing interest in the pharmacology and function of the voltage-gated ion channels that support electrical signaling in muscle and nerve cells. My laboratory uses chemical biology, protein engineering and biophysics to quantify membrane protein function at very high resolution – that of single atoms to channel function. Our use of genetic code expansion and the design, synthesis and encoding of unnatural amino acids to rescue ion channel genes harboring nonsense codons, has yielded several interesting recent discoveries: atomic and subatomic details of the function of ion-channel voltage sensors; new protein-chemical interactions relevant for potassium channel gating; H-bond networks that act as molecular timers in potassium channels; and novel mechanisms of drug interactions with ion channels. Data will be discussed related to the role of novel aromatic side-chain contributions to K channel gating, as well as the role of hydrogen bonds as molecular timers in the process of slow inactivation and inactivation mechanisms in other channels. Further, data are provided for a novel mechanistic basis for a therapeutic potassium channel opener.


Genome Auditorium
Wednesday, March 15, 2017
4:10 p.m.

Host: Rose Dixon redickson@ucdavis.edu