

Distinguished Lecture Series in Physiology



Physiology and Membrane Biology

University of California, Davis

Adam E. Cohen, Ph.D.

Harvard University
Howard Hughes Medical Institute

"All-optical electrophysiology"

To study a neural circuit, one would like to probe the activity of many neurons, with high resolution in space and time. A key challenge has been the difficulty of visualizing changes in transmembrane potential. We discovered that a protein derived from a Dead Sea microorganism could function as an exquisitely fast and sensitive fluorescent reporter of membrane voltage. We developed optical tools for simultaneous optical perturbation and optical readout of membrane voltage. Using these tools we have studied electrical activity in primary neurons in vitro, in acute brain slice, and in live mice. We have also studied human iPSC-based neuronal models of diseases such as pain, epilepsy, and ALS. Optical electrophysiology provides new insights into these complex bioelectric phenomena.

Genome Auditorium
Thursday, May 5, 2016
10:00 a.m.