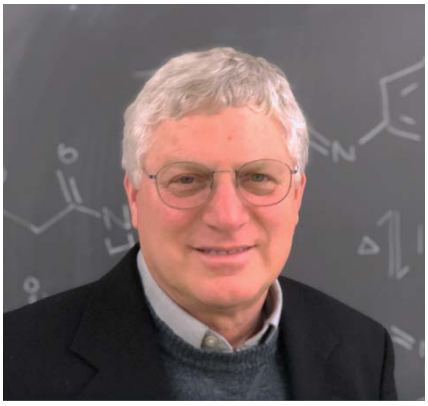
University of Rochester
Flaum Eye Institute Basic Science Seminar Series



Richard H. Kramer, PhD

Dept. of Molecular & Cell Biology, University of California-Berkeley

Richard Kramer-UC Berkeley

Title:

"New strategies for preserving or reviving sight in photoreceptor disorders"

Seminar Topics:

Translating photoswitches into drugs for re-animating vision in the blind

In degenerative blinding diseases such as Retinitis Pigmentosa (RP) and Age-Related Macular Degeneration (AMD), the rod and cone photoreceptor cells die, but the downstream neurons in the retina survive. Most importantly, the retinal ganglion cells (RGCs), whose axons project through the optic nerve to the brain, remain intact. We have developed photoswitches that impart light-sensitivity directly onto native ion channels in RGCs, bypassing the missing rods and cones and restoring the retina's ability to respond to light and send visual signals to the brain. Our ultimate goal is to translate photoswitch molecules into a vision-restoring drug treatment for blind people.

Reversing pathological changes in retinal neurons to minimize vision impairment

In many patients with RP or AMD, vision is seriously impaired but not completely lost. In these people, the visual deficit is a consequence not only of the loss of signal from photoreceptors, but also the rise of noisy interference from downstream retinal neurons. For example, RGCs become hyperactive, obscuring residual signals generated by surviving photoreceptors and corrupting visual information sent to the brain. My research group recently discovered that retinoic acid (RA) is the molecular trigger of RGC hyperactivity. Hyperactivity is greatly reduced by drugs that inhibit either the synthesis of RA or signaling by RA, a process that involves activation of specific genes. The consequence of these inhibitors is dramatic improvement of vision in mice with a progressive form of RP. Ongoing work is focused on understanding how RA brings about hyperactivity and developing long-lasting RA inhibitors as treatments for alleviating vision loss.

Friday, October 4, 2024 @ 1:00PM

Conference Room 2.6408 (K207 Auditorium)

Zoom Meeting ID: 940 7125 4483

https://urmc.zoom.us/j/94071254483