School of Molecular Sciences
Arizona State University

SMS 2023 P&T Seminar

Friday Sept 8 | 1pm | Biodesign Auditorium

There and back again: Navigating cool and hot studies of molecular thermosensing proteins

Temperature is a fundamental environmental factor that impacts virtually all biological processes. The ability to sense and respond to environmental queues is critical to fitness. In humans, transient receptor potential (TRP) ion channels are the canonical molecular thermometers that integrate small changes in thermal energy and signal appropriate physiological responses. This seminar will discuss our most current studies that aim to understand the molecular mechanisms that underlie the function of the canonical cold sensor, TRPM8, and the canonical heat sensor, TRPV1. A vexing molecular feature of these two ion channels is that they are polymodally activated by diverse stimuli beyond temperature. Functionally TRPM8 and TRPV1 are also complicated where they are widely expressed and play diverse physiological roles. Our studies leverage diverse methods from solution nuclear magnetic resonance spectroscopy to whole-cell patch-clamp electrophysiology in our efforts to dissect and quantify fundamental features such as mode-specific cooperativity and polymodal allostery. These studies have diverse implications that range from basic science and enabling the next generation of non-addictive pain therapies to illuminating molecular mechanisms that impact gender -biased outcomes in the clinic.

Wade Van Horn, PhD

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Wade Van Horn is an Associate Professor at Arizona State University. His Ph.D. studies explored protein encapsulation by reverse micelles and supercooled water studies by nuclear magnetic resonance (NMR) spectroscopy. Postdoctoral studies took him to the Vanderbilt University School of Medicine where he continued NMR studies, now applied to membrane proteins and complemented with cellular functional studies including whole-cell patch-clamp electrophysiology. Dr. Van Horn arrived at ASU in 2012 and uses a diverse array of techniques to understand the molecular mechanisms that underlie disease.

*ZOOM option available: https://asu.zoom.us/j/84890997395