VANDERBILT
School *of* Medicine Basic Sciences
Department of Pharmacology

2024 - 2025 Seminar Series

Biomolecules aren't rocks: Perspective on temperature sensors and protein ensembles

One of the biological processes that is most directly connected to the fact that proteins are not static molecules is biological temperature sensing, of which our understanding remains relatively poor. For example, we know of the capsaicin- and heat-sensitive TRPV1, and the other members of the TRP family of ion channels whose range of temperature sensitive properties extends from extreme cold to extreme heat. However, we have yet to understand their temperature sensing mechanism despite an onslaught of structural information of this family from cryo-electron microscopy (cryo-EM). With the help of molecular dynamics (MD) simulation, structural modeling, bioinformatics, machine learning, and advanced methods in cryo-EM analysis we have more insight into these elusive sensors. The mechanisms revealed by this research will improve our ability to 1) develop pain therapeutics and 2) understand the temperature sensitivity of plants and marine bacteria, which play key roles in our global ecosystem.

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4:00 PM

1220 MRB III

Host: Ben Brown