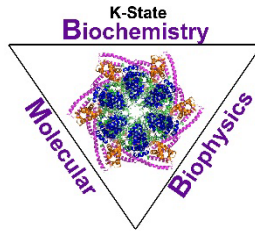


Ackert Hall, Room 120
Wednesday, April 30, 2025
4:00 P.M.



Coffee and Cookies
Chalmers Hall, Room 168
3:45 P.M.

Biochemistry
&
Molecular
Biophysics

Seminar

**Environmental stress perception
in metabolism, aging, and behavior**

Scott Leiser

Molecular and Integrative Physiology
University of Michigan

Organisms must respond to environmental challenges to adapt and maintain health over time. A key aspect of this involved the sensory system and how it allows for organisms to predict their environment and change behavior and physiology accordingly. Our work centers on how cell non autonomous regulation of physiology affects the aging process through metabolic changes. We find that in the nematode *Caenorhabditis elegans*, the perception of a positive nutrient environment leads to signaling from bioaminergic neurons that in turn limits lifespan. This limitation is from prevention of expression of a key intestinal enzyme, flavin-containing monooxygenase (FMO), that is sufficient to improve healthspan, resilience, and longevity. We find that FMO activity leads to a rewiring of metabolism that enhances stress resistance and extends lifespan. Intriguingly, we also find that the induction of FMO signals back to the nervous system through metabolic changes to modify behavior. Together, these results illustrate the complex interplay and feedback between environmental cues, behavior, and physiology, that also modify long-term health.