JAMES MADISON UNIVERSITY

SEMINAR
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Carbon monoxide sensing, selectivity, and signaling in microbes

Abstract: Carbon monoxide (CO) is both a lethal environmental toxin and a biologically active signaling molecule with emerging therapeutic potential. Generated by nearly all organisms on Earth as an enzymatic by-product of heme breakdown, CO influences cellular processes including inflammation, cell proliferation, and apoptosis. As a result, selective CO delivery has been explored as a therapeutic approach to treat chronic inflammation, sepsis, and ischemic injury, though no clinical treatments have been approved to date. CO binds tightly to ferrous heme iron, and this metal-ligand binding interaction has largely shaped our understanding of CO as a poison and signal. While the coordination chemistry that drives this interaction is well understood, specific protein targets that mediate CO-dependent signal transduction remain elusive. A key knowledge gap is the lack of unifying principles that identify a heme binding pocket as selective for CO over other biological gases like oxygen, nitric oxide, and hydrogen sulfide. In this talk, I will present our efforts to elucidate structural features of heme-dependent CO sensors found in microbial organisms that sense and utilize CO as a nutrient source.

Meet the Speaker **2:00 pm, PCB 3144**

Seminar **3:30 pm, King 159**