



## **Chemistry and Biochemistry Department Seminar**

Friday, November 20, 2020

3:30pm on Zoom

*(see Chem/Biochem Majors Canvas site for link)*

# **Capturing transient interactions of proteins involved in natural product biosynthesis**

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How do microorganisms produce chemically diverse and structurally complex molecules? How can humans harness this technology to better human health and the environment? These questions inspire our lab to study acyl carrier proteins (ACPs), which serve as central hubs in polyketide and fatty acid biosynthetic pathways. ACPs are notoriously challenging to study because the fast motions of the ACP phosphopantetheine (Ppant) arm make its conformational dynamics difficult to capture using traditional spectroscopic approaches. In this talk, I will present how the synthetic modification of the terminal thiol of the ACP Ppant arm can transform the ACP reactive site into a vibrational spectroscopic probe that can report on mechanistically relevant movements of the ACP. I will share stories about how we leverage Ppant probes to resolve conformational dynamics on the picosecond time scale and visualize ACP complex formation with functional catalytic partners. We anticipate that these methods will be valuable in future structural and biosynthetic engineering studies because our approach is generalizable, practical, and scalable. Our studies combine concepts and techniques spanning biochemistry, organic chemistry, bioinformatics, and physical chemistry, and therefore I hope this talk will be of interest to a broad audience.