

Hydroxylation of Amines by Flavin-Dependent Enzymes

Pablo Sobrado

Richard K. Vitek/FCR Missouri

Endowed Chair of Biochemistry

Department of Chemistry, Missouri S&T



**Chemistry
Seminar on the
mechanistic
investigation of
flavin-dependent
enzymes**

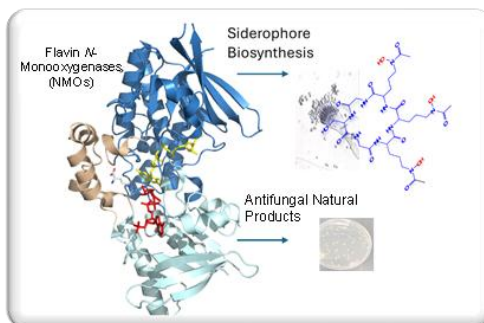
**Monday
September
22 at 4 pm in
126 Schrenk**

**Please contact
Dr. Amitava
Choudhury at
choudhurya@mst.edu
for further
information.**

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Abstract: Flavin-dependent enzymes serve as versatile catalysts involved in microbial virulence, plant metabolism, and the biosynthesis of medicinal natural products. Our research group has made significant contributions to elucidating the mechanisms of action of several flavin-dependent enzymes within these domains.

This presentation will focus on the mechanistic and structural studies of a flavin-dependent nitrogen monooxygenase (NMO) involved in the formation of functional groups such as hydroxamate, nitron, and nitro groups. These groups are essential for the activity of siderophores and natural products with antifungal and antibacterial properties. The seminar will highlight our work using biochemical, structural, and computational approaches to elucidate the role of cofactor interactions, substrate and protein dynamics in intermediate stabilization, and substrate binding and release. Experimental data demonstrating the formation of an enzyme–intermediate complex that enables consecutive rounds of oxidation will also be presented.



About the speaker: **Pablo Sobrado** is the Richard K. Vitek/FCR Endowed Chair in Biochemistry in the Department of Chemistry at Missouri University of Science and Technology (Missouri S&T). He earned his Ph.D. in Biochemistry and Biophysics from Texas A&M University in 2003. After a brief postdoctoral training at the University of Chile, he joined the Department of Biochemistry at the University of Wisconsin–Madison as an American Heart Association Postdoctoral Fellow in 2004. In 2007, Dr. Sobrado began his independent research career in the Department of Biochemistry at Virginia Tech, where he worked for 17 years before moving to Missouri S&T in 2024. Research in his laboratory focuses on elucidating the chemical mechanisms and 3D structures of flavin-dependent enzymes, as well as identifying inhibitors. These enzymes play key roles in the degradation of environmental pollutants, nutrient acquisition in pathogenic fungi, antibiotic resistance, and plant metabolism.