



Chemistry and Biochemistry Department Seminar

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12:15pm

See Chem/Biochem Canvas site for Zoom link

Tuning the Reactivity of First-Row Transition Metals for C–H Bond Functionalization

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Efficient conversion of simple hydrocarbon feedstocks into value-added products remains a major synthetic target. To this end, seeking to emulate the aerobic C–H hydroxylation function of cytochrome P450, metal-ligand multiple bond constructs have been extensively targeted for C–H bond functionalization. The Betley group has reported C–H amination catalysis using high-spin iron dipyrinato complexes, ascribing this reactivity to the unique electronic configuration of an isolated high-spin ferric iminyl. Our studies also highlighted the access to a di-iron bridging imido that can catalytically transfer the *N*-group into allylic and benzylic C–H bonds, emphasizing the importance of establishing a correlation between electronic structure and reactivity. With an interest in further expanding the avenues for C–H bond functionalization, my research group seeks to leverage metal-metal and metal-ligand cooperativity using both synthetic and biological scaffolds to manipulate the electronic structure and reactivity of earth-abundant, first-row transition metals. We aim to target bimetallic complexes to (1) explore a polarization-induced mechanism for C–H cleavage and (2) fundamentally understand electronic structure requirements of bioinspired dimeric oxo motifs for C–H hydroxylation.