

# **Ligand design for bioinorganic chemistry applications**

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The interaction between metal ions and ligands plays a fundamental role in bioinorganic chemistry, from metalloenzymes to medicine. In addition to balancing charge, ligands can tune stability and associated reactivity via diverse bonding pathways and redox activation. Recent developments show that ligands serving as electron reservoirs offer opportunities to expand catalysis, and in the first part of the talk I will discuss the spectroscopic signatures associated with ligand radical systems with the aim to understand the associated electronic structure and reactivity pathways. The second part of the talk will focus on the development of new molecules that target protein aggregation in neurodegenerative disease. As an example, Alzheimer's disease (AD) is characterized by the formation of insoluble aggregates of the amyloid-beta peptide, and these deposits are described as 'metallic sinks' due to the remarkably high concentrations of Cu, Fe, and Zn found within these deposits in AD brains. Our recent results investigating the modulation of metal-peptide interactions via the use of multifunctional ligands will be discussed.