Exploring metalloenzymes for therapeutics and sustainable catalysis

Metalloenzymes are at the heart of numerous biological processes ranging from respiration and photosynthesis to natural product biosynthesis. Research in the Bhagi-Damodaran lab focuses on investigating structure, function and reaction mechanisms of metalloenzymes, and developing rational approaches to modulate their biological activities. Drawing from core disciplines of biological, inorganic, and computational chemistry, our group utilizes protein engineering and small molecule discovery strategies to address pressing health, environment, and energy related challenges facing our society. In this seminar, I will describe our research efforts towards rewiring metalloenzyme-dependent redox signal transduction pathways for next-generation tuberculosis and cancer therapeutics. I will also discuss our research efforts towards re-programing non-heme iron enzymes for modular, versatile, and sustainable C-H bond halogenation catalysis.