

LISA OLSHANSKY

Associate Professor

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Thursday, April 2nd

10:30 AM – 11:30 AM

Steele 006

“Development and Application of PQQ-Dependent Artificial Metalloenzymes”

Abstract: From a periplasmic pyrroloquinoline quinone (PQQ) binding protein, we report the generation of metal-binding capabilities and resultant activity. Installing the metal-binding site adjacent to the redox-active PQQ moiety, the organic cofactor becomes a coenzyme and participates in biocatalytic functionality. Through a combination of spectroscopic, structural, computational, and biochemical investigations, we report the unique structural and functional properties of this new artificial metalloenzyme platform. These studies range from modelling and mechanistic investigation of La^{3+} -dependent alcohol dehydrogenation reaction to examining dynamic pathways for electron transfer and substrate access to the active site. Activity correlations relating to metal ion speciation and the resultant novel modes of reactivity will be presented.

Bio: After completing her B.S. in Molecular Synthesis at UC San Diego, Lisa went on to earn a Ph.D. from MIT as an NSF fellow where her thesis work with Dan Nocera and JoAnne Stubbe was awarded the Davison Prize for best Inorganic Chemistry thesis in 2015. She then performed postdoctoral research with Andy Borovik at UC Irvine as an ACS Irving S. Sigal fellow before starting her independent career at the University of Illinois, Urbana-Champaign in 2018. Now, Lisa and her team are working to mimic and exploit conformational gating mechanisms often exhibited by naturally occurring metalloenzymes. During her early career, Olshansky has been recognized with Searle, Cottrell, Vallee Scholars awards, has received a DOE Young Investigator award, and is a recent recipient of the Camille Dreyfus Teacher-Scholar award, Sloan Research Fellowship, and the Paul Saltman Young Investigator Award for her research on Metals in Biology.