

**Seminar Presentation:**

**Dr. Annette Rowe**

Postdoctoral Researcher, NASA Astrobiology Institute

University of Southern California-Los Angeles

**June 29 (Thursday), 2017**

2:00-3:00 PM

Shantz Bldg. 440

**Electromicrobiology: Understanding mechanisms of microbe-electrode interactions in applied and environmental systems.**

**Abstract**

Electromicrobiology involves extracellular electron transfer (EET) between solid phase electron-active redox compounds and microorganisms. Study of these interactions using electrochemical techniques has provided fundamental insights into microbial physiology, but has also resulted in a variety of microbe-electrode driven applied technologies. The mechanisms (and variations) of outward EET are well understood for two model systems, *Shewanella* and *Geobacter*, both of which employ multiheme cytochromes to provide an electron conduit to the cell exterior. In contrast, little is known about inward EET, even in these model systems. To tackle this limitation, Dr. Rowe’s work has focused on utilizing electrochemical techniques to both understand microbial physiology as well as aid in our ability to culture microbes capable of electron uptake from solids. She will discuss about her work on understanding electrode oxidation in the model system *Shewanella.* She will also present work using electrodes poised at specific reduction/oxidation potentials to enrich environmental microbes. Using this approach in marine sediments, she enriched and isolated several strains capable of taking up electrons from insoluble minerals. Characterization of their genomes will help us understand their metabolic capabilities and their electrochemical properties. The overarching goal of her research is to better understating the environmental importance of these metabolisms in a wide range of ecosystems, but also to expand our understanding of the diversity and mechanisms of microbe-electrode interactions that can ultimately be applied to microbial technologies, including electrosynthesis and bioremediation.

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