

UCSD NANOENGINEERING/CHEMICAL ENGINEERING
Virtual **SEMINAR SERIES**

Wednesday, April 21, 2021

Seminar Presentation: 11:00am - 12:00pm PDT

Join Zoom Seminar:

<https://ucsd.zoom.us/j/98839097984?pwd=a1FKaHprb3dJVGpXSW4wUGxWRUg0dz09>

“Electrochemistry for Sensors and Sustainability”



Ariel L. Furst, PhD

*Raymond (1921) & Helen St. Laurent
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Abstract: Electrochemistry is an exceptionally powerful tool to monitor chemical and biological interactions. By engineering the interface at electrode surfaces, we have significantly improved the selectivity and sensitivity of electrochemical biosensors. Specifically, by combining electrochemistry with synthetic biology, we have developed a platform to detect biologically-active small-molecule environmental pollutants at sub-ppb levels. Similarly, by harnessing the inherent metabolic activity of pathogens, we can detect bacteria that cause food- and water-borne illnesses. Improvements have also been made to the patterning of non-adherent cells for microbial fuel cell applications. By combining improved chemistries for biomolecule modification with unique signal amplification strategies, we have successfully detected targets from extremely complex solutions and improved current generation in microbial fuel cells.

Educational Development and Training: Prof. Furst is passionate about ensuring an inclusive and diverse scientific environment. The pandemic has led to unprecedented changes in how we interact and communicate, both scientifically and socially. Prof. Furst will discuss new efforts in her department to maintain a connected environment for students, even in virtual settings. She will additionally describe key takeaways from developing values statements for her laboratory as well as for incoming graduate students. Finally, as she is an avid cook, she will describe a fun at-home experiment about the coloring used in candy.

Biosketch: Ariel L. Furst is the Raymond (1921) & Helen St. Laurent Career Development Professor of Chemical Engineering at MIT. She received a B.S. degree in Chemistry from the University of Chicago. She then completed her Ph.D. in the lab of Prof. Jacqueline K. Barton at the California Institute of Technology developing new cancer diagnostic strategies based on DNA charge transport. She was an A. O. Beckman Postdoctoral Fellow in the lab of Prof. Matthew Francis at UC, Berkeley developing sensors to monitor environmental pollutants. Currently, her lab combines biological, chemical, and materials engineering to solve challenges in human health and environmental sustainability. She is passionate about STEM outreach and increasing participation of underrepresented groups in engineering.