Abstract
Electrochemistry is an exceptionally powerful tool to form chemical bonds and monitor chemical and biological interactions. By improving the chemistry used to assemble biomolecules on electrode surfaces, the selectivity and sensitivity of these devices has been significantly improved. Superior fabrication methods have led to direct electrochemical detection of the methyltransferase DNMT1, a cancer biomarker, from human tissue samples. Improvements have also been made to the patterning of non-adherent cells for microbial fuel cell applications. Additionally, electrochemistry combined with synthetic biology has enabled the detection of environmental pollutants at sub-ppb levels. 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.

Biography
Ariel Furst is an A. O. Beckman postdoctoral fellow in the lab of Prof. Matthew Francis at the University of California, Berkeley. Her research focuses on the detection of bacterial and small molecule contaminants from complex solutions. She is originally from St. Louis, MO, and she received a B.S. degree in Chemistry from the University of Chicago. Throughout her undergraduate studies, Ariel performed research on the snow flea antifreeze protein in the lab of Prof. Stephen B. H. Kent. 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.