



Ryan White, Ph.D.

Associate Professor
University of Cincinnati

Developing Electrochemical Probes for Localized Detection of Specific Molecules

ABSTRACT:

Electroanalytical techniques afford the ability to perform specific, selective, and sensitive measurements for a wide range of analytical applications. These measurements can be performed with spatial localization when coupled to small scale (mm-nm) electrodes and probes enabling localized measure of surface reactivity. In this talk, I will discuss the recent progress in our group to develop electrochemical sensors, employing nucleic acid recognition elements, and nanoneedle probes for single molecule, resistive pulse measurements, and our push to perform these measurements with high spatial resolution. More specifically, I will discuss our recent efforts in the development of electrochemical, aptamer-based sensors for the detection of small molecules as molecular messengers in the brain. We have created new ways of probing these types of sensors with ms-resolved electrochemical techniques. In addition, I will discuss the use of metal nanoneedle probes to support lipid bilayers for single protein channel measurements and resistive pulse detection and how we are expanding on this to perform localized measurements at the surface of a single cell.

BIO:

Ryan White is an Associate Professor and Ohio Eminent Scholar at the University of Cincinnati with joint appointments in the Department of Chemistry and Electrical Engineering. His research group works on the development of specific chemical sensing and imaging platforms and the application of these platforms towards biomedical and biological applications. Ryan received his bachelor's degree in chemistry from the University of North Carolina (2003) and earned a Ph.D. in chemistry from the University of Utah (2007). He was an NIH NRSA Postdoctoral Fellow at the University of California Santa Barbara. Ryan started his academic career as an assistant professor in Chemistry and Biochemistry at UMBC in 2011, and was promoted to associate professor with tenure in 2016. Ryan joined UC in the fall of 2017. Ryan is also the recipient of the Royce W. Murray Young Investigator Award from the Society for Electroanalytical Chemistry.