Professor Ryan Bailey is the Robert A. Gregg Professor of Chemistry, having begun his position in 2016. Prior to joining the faculty at Michigan, he was a professor of chemistry at the University of Illinois at Urbana-Champaign, beginning in 2006. He received his undergraduate degree in chemistry from Eastern Illinois University in 1999. He then went on to Northwestern University, obtaining his doctorate in 2004 working in Professor Joseph Hupp’s lab. He went on to a joint post-doctoral fellowship at the California Institute of Technology and the Institute for Systems Biology.

Motivated by practical challenges associated with performing multiparameter biological analysis, Professor Bailey leads his group to develop several powerful analysis tools that will be applicable in clinical settings and beyond. His goal is to facilitate personalized diagnosis and individualized treatment by providing a more detailed picture of the biomolecular signatures of disease from a single patient. On account of their simplicity, scalability, and molecular generality, the tools developed in his lab have broad applicability to many aspects of clinical and pharmaceutical research as well as fundamental biological studies.

The concept of personalized medicine is predicated on an ability to comprehend a patient’s disease state in a highly informed manner that ideally illuminates an effective treatment strategy. However, in many cases new technologies are still needed to fully characterize dynamic molecular signatures of disease onset and progression. To this end, our group is developing multiple technologies that aim to increase the depth of biomarker analysis that can be performed in a clinical laboratory setting. One such technology leverages well-established semiconductor fabrication methods to create highly multiplexed and robust silicon photonic biosensor arrays that are extremely sensitive and readily scalable to emerging challenges in point-of-care clinical diagnostics. In this talk, I will describe applications of this technology for cancer and inflammatory-based diagnostics.

“Next generation technologies for individualized medicine”

Professor Ryan C. Bailey
Department of Chemistry
University of Michigan

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