Analytical Chemistry Seminar

Tuesday, November 21, 2023
3:30 p.m. ~ WTHR 320

"Using Multidimensional Analytical Measurements to Assess Chemical Exposure and Lipidomic Alterations"

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Bio: Erin S. Baker is an Associate Professor at the University of North Carolina at Chapel Hill. To date, she has published over 160 peer-reviewed papers utilizing different analytical chemistry techniques to study both environmental and biological systems. Over the last 4 years, Erin also helped grow the Females in Mass Spectrometry group, where she served as the Events Committee Chair from 2019-2022. She is currently serving as the Vice President of Education for the International Lipidomics Society, a mentor for Females in Mass Spectrometry, and an Associate Editor for the Journal of the American Society for Mass Spectrometry. She has received seven US patents, two R&D 100 Awards, been named to the 2019, 2021 and 2023 Analytical Scientist Top 100 Power Lists, and was a recipient of the 2016 ACS Rising Star Award for Top Midcareer Women Chemists, 2022 ASMS Biemann Medal, and 2022 IMSF Curt Brunnée Award. Currently, her research group utilizes advanced separations and novel software capabilities to examine how chemical exposure affects human health.

Abstract:

Upon completion of the human genome project, it was determined that greater than 90% of human diseases are due not solely to a person's genetics but a combination of genetic factors and non-genetic environmental influences. While genetic factors can be readily assessed using rapid genome sequencing technologies, measuring environmental factors is much more challenging. To date either direct or indirect measurements of exposure are often employed for their analysis. In direct measurements, specific xenobiotic compounds are analyzed in environmental samples or in biofluids and tissues, however, many xenobiotics are often excreted before responses even occur. Indirect analyses evaluate how biological processes change due to chemical exposure using one or more complementary omic techniques such as transcriptomics, proteomics, metabolomics or lipidomics. This presentation will demonstrate how combining liquid chromatography, ion mobility spectrometry and mass spectrometry (LC-IMS-MS) separations for direct xenobiotic measurements and indirect multi-omic evaluations enables an in-depth understanding of molecular responses occurring due to chemical exposures.

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