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

Erin Baker, Ph.D.
Associate Professor at University of North Carolina at Chapel Hill

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.