

ANALYTICAL SEMINAR

Bioanalytical Applications and Fundamental Studies Enabled by High-Resolution Cyclic Ion Mobility Separations Coupled to Mass Spectrometry

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Ion mobility spectrometry-mass spectrometry has emerged as an orthogonal and complementary analytical technique to liquid chromatography-tandem mass spectrometry in omics-based analyses. Carbohydrate-containing molecules, such as human milk oligosaccharides and glycolipids, are notoriously difficult to characterize, largely owing to their high degrees of isomeric heterogeneity. Thus, new analytical methodologies are required to improve the confidence of their characterization. In the first portion of this seminar, the use of cyclic ion mobility spectrometry-mass spectrometry (cIMS-MS) in conjunction with multiple tandem mass spectrometry-based strategies is presented as a new method toward the de novo sequencing of carbohydrate-based molecules.

Recently, new insights from high-resolution ion mobility separations have revealed that mass distribution-based effects are responsible for the separation of isotopologues and isotopomers – an observation which should be impossible based on existing theory. In the second portion of this seminar, the use of isotopic shifts to delineate amongst isomers and conformers will be discussed. Additionally, the development of both experimental and theoretical approaches to better understand the fundamental nature of mass distribution-based isotopic shifts will also be presented.



Tuesday, March 11, 2025



3:30 pm



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