

Ion Traps: Taming Molecular Elephants

Ion Trap Interest Group

72nd ASMS Conference on Mass Spectrometry and Allied Topics

Monday, June 3rd, 2023

Presiders: Lucas Szalwinski (Thermo Fisher Scientific), Kimberly Fabijanczuk (Vanderbilt University)

Presentations:

In Memory of James Hager

Scott McLuckey - Purdue University

In Memory of Peter Reilly

Adam Huntley – Washington State University

Multiply-Charged Ion Attachment in a Digital Dual-Trap Mass Spectrometer

Liangxuan Fu – Purdue University

Analysis of Mega-Dalton Mass MALDI Ions Using Linear Ion Trap Mass Spectrometry

Avinash Patil – National Dong Hwa University, Taiwan

A Role for Ion Traps in Top-Down Proteomics

Ryan Julian – University of California Riverside

Development of a Digital Quadrupole/Ion Mobility/Orbitrap Instrument for the Study of Proteins and protein Complexes

Robert Schrader – Texas A&M University

Attendance: ~100

Format: 2 10-min talks honoring the late Peter Reilly and James Hager followed by 4 7-min flash talks

Summary:

The previous year's meeting (2023) showcased a variety of flash talks employing ion traps as reaction vessels using methods such as ion/molecule reactions and UVPD. This year's session aimed to highlight the utility of ion traps for measuring large ions, "molecular elephants". To start off the workshop, the work of the late James Hager and Peter Reilly, ion trap pioneers, were honored by a colleague of each. Following that were flash talks highlighting instrumentation and application achievements and considerations for the use of ion traps to measure large biomolecules. The topics specifically covered were the use of ion/ion reactions in a digital dual-trap MS to improve the accuracy of mass measurements of large proteins, modifications to a linear ion trap to extend the mass range of MALDI generated ions using a frequency scan ejection method, utilizing MS/MS methods such as RDD and CID for top-down proteomics, and a discussion of utilizing a digital quadrupole platform over a ion trap platform to study protein and protein complexes. Following each talk was a brief Q&A session including the audience and at the end of the session the audience was welcomed to discuss further with the invited speakers.