2015 ASMS Workshop Report

FTMS: MS/MS at High Resolution

Tuesday June 2, 2015: 5:45-7:00 pm

Don Smith and Nathan Kaiser, Presiding

Estimated Attendance: 100

Summary of Program and Discussion

- Dustin D. Holden, University of Texas at Austin: "Implementation of Photodissociation on Orbitrap Mass Spectrometers"
- Dr. Huilin Li, University of California – Los Angeles: "Native Top-Down MS of Large Protein Complexes Using FTICR"
- Dr. Jeremy Wolff, Bruker Daltonics: "MALDI-ISD FTMS of Biomolecules"

Dustin Holden, from the Brodbelt group at the University of Texas at Austin presented on the implementation of 193 nm UVPD on an Orbitrap system. UVPD was shown to give a wider array of fragment ions than ETD, while also exhibiting mostly charge independent fragmentation. There was discussion about focusing and collimation of the laser beam. Without focusing, many photons are lost, whereas with focusing there should be more efficient UVPD. A poorly focused laser beam could also result in increased chemical noise in the spectra. An informal poll of the audience suggested that ~10% of attendees used UVPD, ~50% ETD, and ~90% CID for MS/MS studies.

Dr. Huilin Li, from the Loo group at the University of California, Los Angeles presented on ECD of native proteins. Proteins up to m/z 16,000 are observed on their commercial system, with tuning of the multipole frequencies and time-of-flight to the ICR cell. A mass resolving power of 450,000 at m/z 5,500 was shown, using absorption mode processing. ECD of native protein complexes was shown to yield c/z fragments from the accessible parts of the complex.

Dr. Jeremy Wolff, from Bruker Daltonics, presented on MALDI ISD (in source decay) of intact proteins on a FT-ICR MS. Again, high m/z transmission (~ m/z 16,000) was illustrated on a commercial FT-ICR MS. With the correct matrix choice, ISD yields many singly charged C and N terminal fragments which are good for sequencing the ends of large proteins. Multiple transients are typically co-added for only a short amount of time (order of minutes) to acquire the spectra. However, ISD is not good for mixtures. There was a large amount of discussion on this technique, including laser choice, matrix choice, and sample preparation.