INSTRUMENT DEMONSTRATION SUMMARY

Topic: FTICR – lipid imaging  
Time: Wednesday 3:00 pm

Background
The Bruker Daltonics solariX is a hybrid Qq-FTICR mass spectrometer. For MALDI experiments, the instrument has a Smartbeam II solid state Nd:YAG laser capable of laser repetition rates up to 1000 Hz and adjustable laser spot sizes down to 20 \( \mu \text{m} \). The instrument is capable of performing fragmentation experiments using collision induced dissociation (CID), infrared multiphoton dissociation (IRMPD), sustained off-resonance irradiation collision induced dissociation (SORI-CID), electron capture dissociation (ECD) and electron transfer dissociation (ETD). A unique capability of this instrument is a signal enrichment technique called CASI (Continuous Accumulation of Selected Ions) in which a single ion, or \( m/z \) range, is selected with the mass selection quadrupole and the ions resulting from a defined number of laser shots are trapped and held in the accumulation octopole. This can be repeated a specified number of times allowing the selected ion population to be built up resulting in significantly enhanced dynamic range (100-fold) for the mass spectrometric measurement. Many of these features will be demonstrated while setting up a lipid image on a mouse or rat brain section.

Highlights
- Tuning and calibration of the instrument for lipid imaging and MS/MS identification from mouse or rat brain
- “Accumulate During Detect” fast acquisition will be demonstrated from IMS experiments
- FTICR IMS lipid data will be analyzed using flexImaging
- Selected target ions will be identified using CASI and SORI-CID

Instrumental Highlights
- Mass range: \( m/z \) 100-10,000
- High-Mass Resolving Power: >300,000
- High-Mass Accuracy: < 1 ppm
- Signal Enrichment Capabilities using CASI
- \( MS^n \) Capabilities (CID, SORI-CID, ECD, ETD)

Figure 1. FT-ICR data acquired from rat brain highlighting the benefit of high-mass resolution and high-mass accuracy.

Figure 1. Schematic of CASI workflow where target ions are selected and enriched in the collision cell.