

P41 Meeting Bio-AMS Abstract 2016

Title: Direct Coupling of HPLC-MS with Accelerator Mass Spectrometry for ^{14}C -labeled Analyte Measurement

Abstract: Combined quantitative and structural analysis of ^{14}C -labeled compounds in biological systems involves significant analytical challenges. ^{14}C labeling combined with accelerator mass spectrometry (AMS) provides exquisite sensitivity for such experiments, but lacks the ability to provide structural characterization of analytes. We have developed a novel analytical platform that directly couples HPLC, mass spectrometry, and AMS. This analytical platform was recently used to measure metabolism of ^{14}C -labeled tryptophan using the yeast *Saccharomyces cerevisiae* as a model system. The coupled system overcomes traditional limitations of AMS and is currently being used to support several research projects, including DNA adduct characterization, measurement of isotope-labeled proteins, and carcinogen metabolism. This new analytical technology provides quantitative and qualitative data with high sensitivity and high throughput, making detection and characterization of low abundance compounds possible. We envision that the combined LC-MS-AMS platform will be of interest to experimental and computational scientists because it enables experiments that were previously difficult or impossible to perform, even when sample material is limited. Our analytical platform is a unique system for performing biological measurements, and could be used in conjunction with other P41 center resources including proteomics, modeling and simulation, mass spectrometry, and imaging.