

# Joint Analytical & Chemical Biology Seminar



**Prof. Joshua Coon**  
**BioTechnology & Chemistry**

**Presents**

*“Mass Spectrometry for Quantitative  
Biology of Complex Systems”*

The sequencing of the human genome marked the beginning of a collective scientific expedition to understand complex organisms. Genes, of course, merely contain the instructions for which proteins—the ultimate biological effector molecules—populate the cell. Untangling the multi-faceted networks that regulate complex organisms and their diseases will require innovative technologies to globally monitor gene, protein, and transcript. Transcript measurement methods are well-developed, high throughput, and broadly accessible. This capability has had a fantastic and transformative impact on modern biology and medicine. For numerous reasons, protein analysis is considerably less evolved and markedly less accessible, such that we often depend on protein measurement by proxy. In this seminar, we describe the development and use of new mass spectrometry technology to map and quantify proteins on a global scale in complex systems. The instrumentation allows for the implementation of multiple dissociation methods and for the automated selection of these methods in real-time. Protein quantification is accomplished in a multiplexed fashion using isotope based labeling strategies. Finally, we demonstrate the utility of these technologies on a cadre of driving biological problems ranging from the yeast environmental stress response to the maintenance of pluripotency.

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**Thursday, Sept. 26<sup>th</sup> at 12:15 pm in 1315 Chemistry**