

# Analytical Seminar

## Prof. Brandon Ruotolo

*University of Michigan*

*Structural Biology in the Gas Phase: New Approaches  
for Conformationally-selective Inhibitor Screening  
and Multiprotein Topology*

Within each living organism proteins are at work, carrying out activities which impact every aspect of cellular function from synthesis to cell death. A key factor in varied protein functionality is their ability to self-assemble, creating vast molecular 'machines' capable of performing intricate, highly specialized tasks. To rapidly discover the structural properties of such assemblies, especially when bound to therapeutic small molecules, is a grand challenge for structural biology which is nearly insurmountable with current tools. In this presentation, I discuss recent developments in ion mobility-mass spectrometry (IM-MS) methods aimed at bridging this gap in basic technology. The IM-MS approaches developed by my group exploit a series of highly-accurate, gas-phase measurements of protein size and mass to rapidly determine multiprotein architectures and stabilities when bound to small molecules, without the need for covalent labels or tagging, and consuming 10-100 times less protein than almost any other label-free technology. Recent IM-MS applications, including: Multi-protein structure modelling, high-throughput discovery of conformationally-selective inhibitors and the rapid structural characterization of biotherapeutics will be discussed.

Thursday  
November 19

12:15 p.m.  
1315 Chemistry

Coffee & cookies at  
12 p.m. outside  
1315



DEPARTMENT OF  
**Chemistry**  
UNIVERSITY OF WISCONSIN-MADISON