

## Application to NRI Major Instrumentation 2011

**Abstract:** We are seeking funds to purchase a new mass spectrometer to enhance and expand the ability of University of Nebraska researchers to perform crucial analyses of proteins, peptides and small molecules. The applicants worked together campus-wide to insure suitability of this instrument for a wide-variety of cutting-edge needs, combining the needs of three initial groups into one instrument to maximize the use of valuable funds, seek efficiency, and gaining new interdisciplinary collaborations and exchange of technology. Specifically we propose to acquire instrumentation that does not exist at the University of Nebraska: a quadrupole/time-of-flight (Q-TOF) Ion Mobility Mass Spectrometer coupled to an Ultra Performance Liquid Chromatography (UPLC) system. Specifically, this is from Waters Inc., and is a SYNAPT G2 MS system coupled to a nanoAcquity UPLC. The Ion Mobility Mass Spectrometer is innovative technology enabling a host of discovery (including drug discovery) and analytical (to be used to uncover the causes and effects of disease) methodologies. The UPLC enables precise, high quality separations, and is configured as a chip system to allow diverse users allowing users to rapidly switch between applications such as proteomics and metabolomics. This instrumentation and its technology has won numerous awards and is key to our researchers meeting the strategic research plan for UNMC, and will continue to facility interactions with researchers at other UN campuses. Our existing mass spectrometry technology has led to our researchers gaining multi-million dollar NIH awards, and to stay competitive and on top of the field access to more advanced instrumentation is necessary. The acquisition of this instrument will lead to grant renewals, new grant funding, outstanding technology development and education in Nebraska, and significant scientific progress, furthering our ability to meet the our campus' and the University of Nebraska's mission.