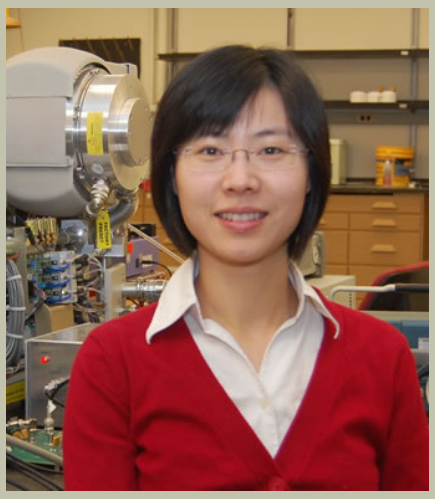

PROFESSOR YU XIA

Purdue University
Department of Chemistry

"Radical" Mass Spectrometry— A New Path in Bioanalysis

Thursday

April 7, 2016

12:15 pm

Room 1315

Chemistry Bldg.

Structural isomers of biomolecules often coexist in biological systems and fulfill distinct functions. Their identification and quantitation present challenges to many analytical techniques, including mass spectrometry (MS). Research efforts in our group are focused on implementing radical reactions in MS analysis to obtain highly specific structural information of biomolecules, such as disulfide linkage pattern in peptides and carbon-carbon double bond (C=C) locations in lipids. As an example, an online photochemical derivatization has been coupled with MS to perform global characterization and quantitation of lipid C=C location isomers in plasma, cells, and tissues. New opportunities are emerging for investigating the roles of lipid C=C location isomers in biological processes and potential as biomarkers for disease diagnosis. Radical reactions at the sampling interface of a mass spectrometer have also been developed as a new means of synthesizing bio-radicals and probing their chemical-physical properties, which otherwise are difficult to investigate in the condensed phases. Examples will be presented on reactivity study of cysteine disulfide bonds with OH radical and the chemical property of thus formed cysteine sulfinyl radical (-SO•).