DEPARTMENT OF
Chemistry
UNIVERSITY OF WISCONSIN-MADISON

Ph.D. Dissertation Defense

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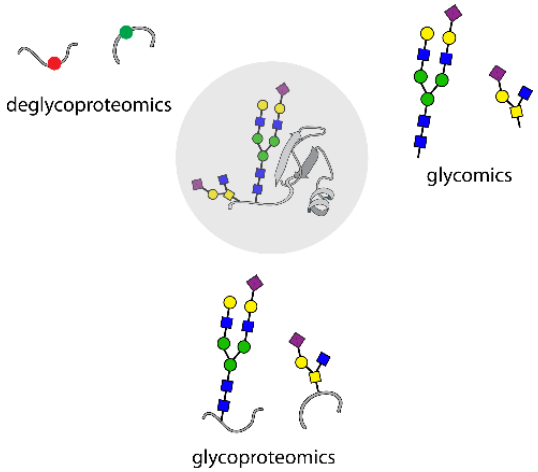
Lingjun Li Research Group

"Advancing mass spectrometry methods for glycosylation analysis and their application to disease-related glycol-alteration study"

Protein glycosylation has been well-know to play a key role in various biological processes as well as in disease-related pathological progesssion. To better understand glycosylation's role in an undelying mechanism, comprehensive characterization and quantitation of glycoproteome in different biological systems is needed. Mass spectrometgry (MS)-based glycoproteomics is a powerful approach that provdies a system-wide profiling of the glycoproteome in a high-throughput manner. We have developed a multi-dimensional mass spectrometry (MS) platform, including HILIC-MALDI-MSI and LC/CE/IM-ESI-MS, to characterize both released glycans and intact glycopeptides at a system-wide level. Quantitation strategies at MS^1 and MS^2 level with isotopic and isobaric tags were also developed for quantitative analysis of glycans and glycopeptides across different disease/control samples. The developed analytical strategies helped to reveal glycosylation alteration in breast cancer and Alzheimer's disease (AD) and contributed to an improved understanding of the role of glycosylation in pathological processes.



July 9, 2018
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