**KEYNOTE LECTURE 5**

Glycomics & Protein Analysis Session (Monday, March 27, 15:30, Sorbonne 4)

## Characterizing glycan and glycopeptide isomers derived from biological systems by LC-MS/MS

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**Abstract**:

Glycosylation, as one of the most common post-translational modification (PTM), plays critical roles in various biological processes. Development of quantitative glycomics/glycoproteomics profiling methods is essential for understanding the biological attributes of glycans. Although high-resolution mass spectrometry facilitates accurate sequential identification of glycans, identification of glycan isomers is not readily attainable without LC separation. Moreover, the interpretation of isomeric microheterogeneity associated with the glycosylation sites of proteins is one of the major technical challenges of glycoprotein and glycopeptide analysis. Here, isomeric separation of released N-glycans and glycopeptides on the porous graphitic column at elevated temperatures will be described and discussed.

Permethylation of glycans enhances ionization efficiency, stabilize sialic acid and eliminates fucose rearrangement. However, the isomeric separation of permethylated glycans is always not satisfactory due to the increased intramolecular interaction after permethylation. In this study, we have achieved efficient isomeric separation of permethylated glycans by using PGC-LC at 75 oC. Similarly, isomeric separation of glycopeptides was also achieved using PGC column at elevated temperatures. Base peak isomeric separation of glycopeptide mixture was attained at 75oC. We are reporting here for the first time, the ability to attain isomeric separation of released N-glycans and glycopeptides on PGC columns at elevated temperatures. Accordingly, comprehensive characterization of the isomeric microheterogeneity of the glycosylation sites of proteins is readily achieved by interfacing PGC columns to mass spectrometry.

We are reporting here for the first time the efficient isomeric separation of glycans and glycopeptides on PGC column at elevated temperatures. Accordingly, comprehensive characterization of the isomeric micro heterogeneities of the glycosylation sites of proteins is readily achieved by LC-MS/MS analysis on PGC column at elevated temperature.

**Short Biography**:

Yehia Mechref is a professor in the Department of Chemistry and Biochemistry at Texas Tech University, Lubbock, TX. He received his B.Sc. in chemistry from the American University of Beirut (Beirut, Lebanon) and his PhD with an honorable mention from Oklahoma State University (Stillwater, Oklahoma).

Dr. Mechref's research focus is on the development of sensitive biomolecular mass spectrometry methods enabling qualitative and quantitative assessments of the roles of proteins, glycoproteins and glycans in biological systems. Thus far, Dr. Mechref has published 22 review articles, 14 book chapters and 156 peer-reviewed research papers. Currently, Dr. Mechref Scopus H-index is 46 with 6115 citations. He received 11 US patents.

He has organized and co-organized numerous symposia and conferences. Dr. Mechref is the recipient of Barnie E. Rushing JR. Faculty Distinguished Research Award in 2016 and Barnie E. Rushing JR. Faculty Outstanding Research Award in 2015.