**Structural Characterization of Glycans by Tandem Mass Spectrometry**

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Challenges in glycan structure determination arise from their structural complexity, lack of glycan amplification methods, limited glycan database information, and the presence of many closely-related structures in most naturally-occurring glycan mixtures.

Mass spectrometry (MS) has emerged as an indispensable tool for structural glycomics. In particular, detailed glycan structural information can be generated by tandem MS employing a variety of fragmentation methods. Traditionally, this was achieved by multistage tandem mass spectrometry (MSn) using collision-induced dissociation (CID) as the fragmentation method. However, the MSn approach lacks the sensitivity and throughput needed to analyze complex glycan mixtures from biological sources, often available in limited quantities.

Recently, we have demonstrated the utility of electron activated dissociation (ExD) methods in glycan structural analysis, and showed their compatibility with on-line liquid chromatographic (LC)-MS/MS analysis. Here, we will present our current understanding of the various ExD processes, as well as their application to analysis of biological samples. We will also present our recent work on the coupling of glycan separation techniques to tandem MS analysis, with emphasis on the development of selected accumulation ion mobility spectrometry (SAIMS)-ExD tandem MS for structural analysis of isomeric glycans.

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