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Applicability of MALDI MS/MS for detailed structural analysis of complex oligosaccharide mixtures

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Human milk oligosaccharides (HMOs) represent an important class of biomolecules which provide non-nutritional benefits to infants. Due to complexity of HMO samples (up to hundreds of HMOs), as well as isomeric nature of HMOs, LC-ESI-MS represents a method of choice for quick structure assignment based on R_t and m/z values. However, this approach requires previously determined R_t values for HMOs of interest. Detailed MS/MS structural analysis, particularly of novel structures, has not been reported in the literature using LC-ESI-MS/MS approach. In contrast, MALDI MS/MS has been successfully applied for detailed structural analysis of HMO structures on Q-TOF and Q-IT-TOF instruments. While MALDI MS/MS analysis is very complex when isobaric precursor ion mixtures are analyzed, numerous practical advantages, such as time available for optimization of MS/MS conditions, long accumulation of low intensity MS/MS spectra, as well as option of additional experimentation following data analysis, makes MALDI MS/MS method of choice for detailed structural analyses, particularly of previously unknown or partially characterized structures. We have recently published a MALDI Q-TOF MS analysis of a chromatographic HMO fraction and found that MALDI Q-TOF CID MS was crucial for detection of low intensity diagnostic ions, as well as detailed MS/MS analysis of precursor ions near detection limit.

Biography

Marko Jovanović earned his PhD degree in Biomedical Sciences from Medical College of Georgia, USA, at the age of 30. He learned mass spectrometry in laboratory of Prof. J. Peter-Katalinić at the University of Münster. He is currently working as Assistant Professor at Department of Biotechnology, University of Rijeka, Croatia. He has published 4 papers in respectable peer-reviewed journals.

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