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N-glycan analysis on monoclonal antibodies using MALDI-Q-IT-TOF

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Monoclonal antibodies (MABs) are increasingly being used for the treatment of cancer or other autoimmune diseases. Correct glycan structure of MABs is essential for functional and biological activity of the related MAB such as identification of antigens triggered by immune system cells, regulation of the signaling activities and physicochemical properties of produced therapeutics etc. Therefore, rapid monitoring of glycan structure is very critical for therapeutic drug production, biosimilar drug production and their quality control processes. The principal of this study is the characterization of glycan structure of MABs. In our study, glycan structure of Trastuzumab, used as a drug for the treatment of breast cancer was characterized. N-glycans were enzymatically released from Trastuzumab protein structure by trypsin digestion and PNGase F (Peptide:N-Glycosidase F) cleavage. Moreover, special buffer exchange and solid phase extraction procedures were used for the clean-up purposes prior to MALDI-TOF-MS (Matrix Assisted Laser Desorption/Ionization-Time of Flight- Mass Spectrometry) detection. After designing appropriate sample treatment and optimization, GO, GOF, G1, G1F, GOF-GN glycans were clearly detected by MALDI-Q-IT-TOF MS without any labeling or using any additional chromatographic separation methods. The current talk deals with the theoretical and experimental aspects of MALDI-Q-IT-TOF MS for the study of glycans on monoclonal antibodies. Sample preparation procedures and tips for MALDI-TOF-MS measurements will be addressed and the original data obtained from MALDI-Q-IT-TOF MS will be presented.

Biography

Gulce Ozmen has received her BSc degree in Biochemistry, Faculty of Science from Ege University in 2006. She is currently pursuing her Master's thesis about glycan analysis of monoclonal antibodies. At the same time she is working as a Scientific Researcher at the Center for Drug Research & Development and Pharmacokinetic Applications (ARGEFAR) since 2008. Her professional experience includes usage of HPLC, LC MS and MALDI-TOF-MS techniques. Her research interest covers physicochemical characterization of biosimilar drugs and biopharmaceutics.

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