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Integration of nanotechnology into glycomics: Construction and application of glycan and lectin biosensors

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Integration of nanotechnology into the field of glycomics can address current limitations of fluorescent glycan and lectin microarrays. Moreover, label-free transducing schemes especially when working in an ultrasensitive fashion can be applied in a reliable detection of low abundant disease biomarkers. For example, electrochemical impedance spectroscopy applied in our studies allows detecting analyte molecules down to a single molecule level (i.e., aM level) if immobilization architecture of ligands (lectins or glycans) is controlled at nanoscale. Utilization of such devices in serological glycoprofile of samples from people having some diseases, in analysis of cancer biomarkers, cancer cell lines and viruses will be discussed.

Biography

Jan Tkac has received his PhD degree in Biotechnology at the Slovak University of Technology (Bratislava, Slovakia) in 2000. He has received his Postdoctoral appointment at the Linkoping University (2001-2003), Lund University (2003-2006) and Oxford University (2006-2008). Currently, he works at the Institute of Chemistry, Slovak Academy of Sciences in Bratislava. He is a recipient of an Individual Marie Curie Fellowship (2003) and an ERC Starting grant (2012). His main research activities cover a microarray platform of detection of glycoproteins by lectins with the aid of nanotechnology. He has published 80+ scientific articles, reviews and 4 book chapters having 1000+ citations.

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