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Protein profiling in plant extracts using chip-based capillary electrophoresis for identification of genetically modified organisms (GMO)

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A rapidly increasing cultivation of different genetically modified (GM) plants, and numerous social controversies concerning their use in food production, requires continuous improvement of analytical methods for the determination of transgenic material in foods. This is carried out simultaneously with the examination of biological and biomedical aspects of genetically modified organisms (GMO) in foods, as well as the safety assessment of genetically modified foods. The most commonly used methods for analysis of GMO are PCR techniques, and also immunochemical determination the encoded new proteins. In the studies, the capillary gel electrophoresis in a chip format with laser-fluorescence detection was applied in protein profiling of fractionated and total extracts of maize standards. The sensitivity of such determinations can be enhanced by lyophilization of extracts or using cut-off filters. Especially effective pretreatment step in the determination of low abundance proteins was using done combinatorial peptide ligand library for sample processing prior to the electrophoretic analysis. Several reproducible differences were observed for protein profiles between maize standards not-containing the genetically modified organisms (GMO) and those containing GMO, what can be potentially employed for identification of GMO in maize samples and foods of maize origin.

Biography

Marek Trojanowicz received MSc, PhD and DSci degrees from Department of Chemistry, University of Warsaw. He was a visiting Professor in numerous universities, including long-term appointments in University of Michigan, University of California at Riverside, University of Tasmania, Australia, and University of Sao Paulo, Brazil. Currently, he is a Professor of Chemistry, Head of Laboratory for Flow Analysis and Chromatography in Chemistry Department of University of Warsaw and Head of research group in Institute of Nuclear Chemistry and Technology in Warsaw. He is author of 250 scientific papers in refereed journals, 30 chapters in books, 2 monographic books, and editor of 1 book in the field of flow analysis and automation of analytical measurements. His research interests includes electrochemical sensors and biosensors, flow analysis, liquid chromatography and capillary electrophoresis for environmental, food and clinical analysis, application of ionizing radiation for water and waste treatment, and application of chemical analysis in archaeometry.

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