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Analytical Developments and Biomedical Applications of Capillary Electrophoresis in Non-Targeted Metabolomics

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In this keynote, the powerful of capillary electrophoresis (CE) coupling with mass spectrometry (MS) for the metabolomic studies was showed. The high polarity of the studied compounds is a drawback for their analysis by liquid chromatography, as they are not retained in reverse phase columns. So, the use of CE-MS is very promising tool to obtain useful results in ionic or polar compounds in aqueous or highly ionic media, such as urine or cell culture media. In addition, the selection of a proper sample treatment is mandatory to obtain a good reproducibility in CE-MS. This topic was widely discussed in the presentation. In this presentation very interesting applications in the field of biomedical, which the use of CE-MS has a key role, were discussed. From my point of view, the most interesting application was the metabolic fingerprinting of Leishmania resistance to antimony treatment by CE-MS.

Use of High Resolution Mass Spectrometry (Orbitrap) for Simultaneous Determination of Pesticides and Mycotoxins in Green Tea Nutraceutical Products

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Nutraceutical is a hybrid term characterizing a combination of nutritive and pharmaceutical products. The interest and demand in this class of products are under constant growing in a global world market. From their origins, it is possible to find toxic substances that can be presented in the raw material, as pesticides and mycotoxins. The current legislation does not establish a maximum residues limits for this type of products. However, it is possible to find these residues at trace levels in these samples. Thus, it is necessary to develop a new quantification methods. In this work UHPLC-Orbitrap-MS has been successfully applied for the determination of pesticides and mycotoxins using a generic method called dilute-and-shoot. The breakthrough in MS has allowed the use of this type of generic method. This method is based on the addition of an organic solvent to the sample, agitation and further injection without any other additional step. Orbitrap-MS allowed to achieve a very high sensitivity. Thus, quantification limits lower than $10 \mu\text{g kg}^{-1}$ was obtained. The results show that the use of high resolution mass spectrometry could be used in routine analysis for these type of samples.

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