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SOME EXAMPLES OF MASS SPECTROMETRY APPLICATIONS

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Mass spectrometry (MS) is one of the most important analytical techniques in the twenty-first century. It has been widely applied in several fields of medicine, chemistry, and physics and also in human habitat studies. MS can be implemented as a targeted or an untargeted approach. Here we present three different examples of liquid chromatography-tandem mass spectrometry (LC-MS/MS) applications. Two of them focus on targeted method development and validation and have been successfully validated according to the recommendations of the regulatory agencies. The third approach aims to evaluate the chemical background of modern human habitat designed as untargeted analysis based on three-dimensional (3D) cartography MS. The first example of targeted LC-MS/MS method applicability has been shown in clinical practice. Different methods validated in our laboratory have been applied in pharmacokinetic studies and therapeutic drug monitoring. The second type of applications enforced the importance of MS in basic science studies, such as monitoring neurotransmitters in tissue and cell cultures. We have been able to simultaneously determine four different groups of neurotransmitters, including monoamines, amino

acids, nucleotides and neuropeptides in bovine chromaffin cell cultures, rat brain extracts and human plasma samples, where altered neurotransmitter levels could be detected due to stress. The untargeted approach, 3D cartography MS, examines the chemical background associated with modern human habitat in order to detect the chemicals distributed in humans and their environment. Consequently, a great utility of MS has been shown as it has been successfully applied to different research purposes.

Biography

Aneta Wojnicz has completed her Master's Degree in Environmental Biotechnology at Warminsko-Mazurski University (Poland)/Leibniz Hannover University (Germany) and her PhD in Clinical Pharmacology at Autonomous University Madrid (Spain). Currently, she is working at the Analytical and Pharmacokinetic Unit in the Clinical Pharmacology Department, Hospital Universitario de La Princesa, Spain. The aim of the unit is to develop and validate analytical LC-MS/MS methods for drug quantification in biological fluids. She has published more than 10 papers in reputed journals.

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