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On-line multidimensional SPE-LC-(UV)-MS/MS as an alternative approach for analyzing small molecules in biological fluids

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Abstract

Liquid chromatography-tandem mass spectrometry (LC-MS/MS) is one of the most popular and used method for the quantification and quality control of drugs in biological fluids. Treatment of highly complex biological samples such as blood, plasma and urine is often error prone and it is almost impossible to inject biological matrices directly to these highly selective and specific modern mass spectrometers. Considering over the 80 % of analysis time is spent on the sampling and sample-preparation steps, it is crucial to develop fully automated on-line methods prior to LC-MS/MS analysis.

The clean-up of complex matrix like biofluids prior to chromatographic analysis, on-line solid-phase extraction (SPE) is the predominant technique. By using this technique it is possible to 1) complete removal of low molecular weight sample components which influence the electrospray ionization process; 2) complete removal of high molecular weight matrix components such as proteins, polysaccharides and nucleic acids; 3) have total automation; 4) achieve robustness, e.g. long SPE column lifetime; 5) extract of a broad spectrum of analytes; 6) have high speed and throughput respectively.

In this study, we report a fully automated on-line multidimensional SPE-LC-(UV)-MS/MS method for the determination of a model drug in whole blood and plasma samples.

Biography

Sena Caglar has a B.S. degree in Chemical Engineering and Ph.D. in Analytical Chemistry (Istanbul University, 2011). She conducted a post-doctoral study in the field of clinical chemistry for 20 months at BioSeparation Laboratory (LMU, Germany) with the research group of Prof.Dr.Dr. Karl-Siegfried Boos. She is currently a Senior Scientist in Istanbul University, Faculty of Pharmacy. Her research interests include the proteomics, metabolomics, hyphenated sample preparation techniques, chromatographic/mass spectrometric analysis and drug determination in biological fluids.