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Direct analysis of drugs in biological fluids by on-line chromatography

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In pharmaceutical, bioanalytical and biomedical sciences analysis of drugs and metabolites in biological fluids is essential for bioequivalence/bioavailability, therapeutic drug monitoring and drug abuse studies. An optimal and effective sample preparation method plays the most important role since the depletion of the matrix in biological fluids is the biggest issue for a trouble-free analysis. It is impossible to inject the biofluid directly to the chromatographic system with traditional methods but this challenge was overcome by the on-line methods. Combination of solid phase extraction (SPE) with high performance liquid chromatography allows direct analysis of small molecules (i.e., drugs) in biofluids. The method, in summary, depends on connection of the SPE column, coated with various packing materials, directly to the analytical column (where the analytes are separated) through a switchingvalve and injection of the sample to the system. Following the injection, i) the matrix components are depleted and ii) the analytes are separated in the column. Thus, sample preparation step from the biological fluid is completely eliminated and the sample can be directly injected to the system resulting with high reproducibility in the analyses.

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Characterization of nanoparticles: How to meet the multiple challenges?

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The development of nanotechnologies inevitably induces the need for analytical methods capable of characterizing nanomaterials such as nanoparticles and nanotubes. The challenge remains important due to the diversity in size, shape, chemical composition of natural and engineered nano-objects combined with the complexity of the surrounding media. Some years ago, Field-Flow Fractionation (FFF) coupled with UV, Multi-Angle Light Scattering (MALS) and atomic mass spectrometry (ICPMS) has been proposed as a powerful analytical strategy for such challenge. In this presentation FFF will be presented from its principle to its analytical performances. Different examples of applications in material sciences and environmental media will be presented in order to illustrate the capabilities of FFF-multidetection.

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