Anal Bioanal Chem (2013) 405:5857–5858
DOI 10.1007/s00216-013-7018-7

EDITORIAL

Liquid chromatography–tandem mass spectrometry

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Published online: 24 May 2013

Over the last 20 years LC–MS techniques have advanced dramatically in their sensitivity, specificity, and reliability, mostly because of the development of hyphenated chromatography–mass spectrometry techniques. Currently one of the great challenges in environmental analysis and food safety is evaluation and control of the risks associated with the presence of mixtures of emerging contaminants; this has resulted in swift growth in the use of LC–MS–MS which is, today, the method of choice for determination of many polar and medium-polar classes of contaminants in environmental, biological, and food samples. Much effort has applied to the development of more efficient extraction and clean-up procedures by automation and coupling of sample-preparation and detection systems (for example, on-line SPE or dual LC column systems), application of advanced sorbents (e.g. nanoparticles as sorbents), and use of more environmentally sound approaches, for example solvent-reduced techniques. Moreover, there is a growing demand for high-throughput analysis, because of the growing number of samples, and shortening of analytical run times is often required in laboratories conducting environmental monitoring studies or food quality control. Run times of several tens of minutes are not acceptable, so the emphasis is on achievement of maximum chromatographic resolution in a drastically reduced time by application of fast and high-resolution LC systems (for example ultra-high pressure liquid chromatography (UHPLC), high-temperature liquid chromatography (HTLC), or monolithic and fused-core columns). Another recent trend is the use of hydrophilic interaction chromatography (HILIC) for separation of polar compounds. With regard to mass analysers, hybrid instruments, for example QqTOF, QqLIT, and Orbitrap, are becoming more popular, because of their capabilities in achieving accurate mass measurements and acquiring indispensable qualitative information in the form of full-scan spectra. Another notable trend is a gradual shift from parent compound analysis to analysis of metabolites and transformation products. It is becoming evident that more research is needed to determine breakdown pathways and to evaluate the fate of transformation products formed by biotic and abiotic processes.

This issue of "Analytical and Bioanalytical Chemistry" contains selected papers presented at the 8th Annual Workshop on LC–MS–MS—Workshop on Environmental Applications and Food Safety, held on 2–4 July 2012 in Barcelona, Spain, and organized jointly by CSIC (Consejo Superior de Investigaciones Cientificas, Barcelona, Spain), the Catalan Institute for Water Studies (ICRA), Waters Corporation (Manchester, UK), Environment Canada, and the Institut d'Estudis Catalans (Barcelona, Spain), in collaboration with the Spanish Society for Mass Spectrometry (SEEM).

In the course of the workshop a total of 35 keynote lectures and 56 posters were presented in three main sections

- general aspects of LC–MS–MS analysis;
- environmental applications; and
- food applications

covering practical aspects of the usefulness of tandem mass spectrometric techniques for screening and quantification of organic contaminants in environmental and food samples.

The papers presented give an overview of the advantages of modern tandem and hybrid MS technology, and compare and contrast their use for quantitative and qualitative determination of complex environmental and food samples.

We would like to thank all the authors of this selection of articles for their participation in the workshop and for their

Published in the special paper collection *Liquid Chromatography—Tandem Mass Spectrometry* with guest editors Damià Barceló and Mira Petrovic.

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written contributions that made this collection of papers possible.

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