

## Advances in LC–MS/MS analysis of environmental and food samples

Damià Barceló<sup>1,2</sup> · Mira Petrovic<sup>2,3</sup>

Published online: 10 April 2015  
© Springer-Verlag Berlin Heidelberg 2015

The application of advanced tandem and hybrid liquid chromatography–mass spectrometry (LC–MS) instruments in the field of environmental analysis and food safety has enabled the determination of a broader range of compounds in environmental and food samples and thus permitted more comprehensive risk assessment. Impressive improvements in detection limits for organic contaminants, mostly brought about by advances in hyphenated LC–MS techniques, have improved target concentrations from the microgram to the nanogram or picogram per liter range. With the progress in analytical instrumentation, extraction techniques have also become more simple, fast, and inexpensive, enabling the enrichment of analytes of interest from

complex environmental or food matrices. All these improvements led to the detection of many harmful compounds at the levels at which they have a biological effect in the environment, and several new or previously ignored and/or unrecognized contaminants have come under scrutiny. Currently one of the great challenges in food safety and environmental analysis is the analysis and assessment of risks associated with emerging contaminants, for example nanomaterials (organic and inorganic), perfluoroalkylated substances, personal-care products, and pharmaceuticals used in human and veterinary medicine including hormones, among others.

The topical collection in this issue of *Analytical and Bioanalytical Chemistry* provides an indication of current trends in the analysis of emerging contaminants in environmental and food samples. The articles presented here reveal some recent achievements in the analysis of fullerenes, pharmaceuticals and illicit drugs, artificial sweeteners, and perfluorinated compounds, giving examples of advantages, comparisons, and complementarities of state-of-the-art tandem and hybrid MS technology for the quantitative and qualitative determination of complex environmental and food samples.

We would like to thank all the contributing authors for their time and effort in preparing this topical issue, as well as the referees for their constructive comments and the Editorial office for their cooperation.

---

Published in the topical collection *Advances in LC-MS/MS Analysis* with guest editors Damià Barceló and Mira Petrovic.

✉ Damià Barceló  
dbcqam@cid.csic.es; damia.barcelo@idaea.csic.es

<sup>1</sup> Water and Soil Quality Research Group, Institute of Environmental Assessment and Water Research (IDAEA-CSIC), C/Jordi Girona 18-26, 08911 Barcelona, Catalonia, Spain

<sup>2</sup> Catalan Institute of Water Research (ICRA), C/Emili Grahit 101, 17003 Girona, Catalonia, Spain

<sup>3</sup> Catalan Institution for Research and Advanced Studies (ICREA), Barcelona, Catalonia, Spain



**Damià Barceló** is Full Research Professor at the Institute of Environmental Assessment and Water Studies IDAEA-CSIC, and has been Head of the Environmental Chemistry Department (Barcelona, Spain) since 1999 and Director of the Catalan Institute of Water Research (ICRA) (Girona, Spain) since May 2008. His scientific focus is on method development and monitoring of priority, new, and emerging pollutants, in particular in water-quality assessment and management. In 2007

he was awarded the King Jaime I Prize for the Protection of Nature by the Generalitat of Valencia, Spain, for his outstanding scientific work. In 2011 he received the Prince Sultan Bin Abdulaziz International Prize for Water (PSIPW) 5th Award 2012 on Water Management and Protection, Saudi Arabia, and in 2012 the Recipharm Environmental Award, Sweden. From 2013 to 2019 he coordinates two European-Union-funded projects, GLOBAQUA on multiple stressors in European river basins, and Sea-on-a-Chip on sensor development for fast detection of emerging contaminants in marine aquaculture.



**Mira Petrovic** is an ICREA research professor at the Catalan Institute for Water Research (ICRA) in Girona, Spain. Her main expertise is in analytical environmental chemistry, specifically analysis of organic micropollutants by use of advanced mass-spectrometry techniques and study of their fate and behavior in the aquatic environment and during treatment of wastewater and drinking water. She has published over 150 papers in SCI journals (Hirsch Index 48) and edited seven books. She is

included in the ISI Highly Cited in the fields of Chemistry and Environment/Ecology. Currently she is the editor in chief of Trends in Environmental Analytical Chemistry and coordinates the European-Union-funded project TreatREC (H2020 MSCA-ITN-EID).