

# High-resolution mass spectrometry

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High-resolution mass spectrometry (HRMS) using double-focusing mass analyzers was established in chemistry laboratories in the 1960s. Coupled to a direct insertion probe or to gas chromatography, it revolutionized the elemental analysis of organic compounds. It also became a powerful tool in bioanalytical research providing high selectivity and specificity. However, modern benchtop GC–MS instruments cost significantly less and have been coupled to the faster scanning quadrupole or ion-trap mass analyzers, largely displacing GC–HRMS in most fields.

Modern LC–MS instruments using electrospray ionization have many applications in bioanalytical laboratories and in “omics” research. Manufacturers, for arguably the first time, recognized a sizeable market for HRMS. In the past few years, robust GC–MS and, particularly, LC–MS equipment, mainly using time-of-flight or Fourier-transform mass-analyzer technology, are becoming increasingly affordable by many laboratories. This is also apparent from the remarkable increase in the number of publications.

Therefore, the objective of this special volume is to give an overview of the current use of HRMS in the life sciences. Four review articles critically assess the use of HRMS in clinical and forensic toxicology, doping control, drug metabolism studies, food analysis, and the environmental sciences. This overview is followed by four original papers with new results from application of HRMS to drug screening, doping control, glycomics, and proteomics.

We hope you find this special issue an invaluable source of information; it is intended for all readers with an interest in application of HRMS in clinical and forensic toxicology, doping control, drug metabolism, food analysis, environmental sciences, and proteomics and related fields. We thank all authors for submitting their interesting contributions for this special issue, the referees for their critical but constructive comments, and the editorial office and the editors for their friendly cooperation.

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