Recent developments in the application of separation and hyphenated techniques in current diagnostic challenges

Aims & Scope:

Development of robust, sensitive and reproducible methods for diagnosing diseases is crucial for the effective therapy. A major challenge facing modern medicine is not only rapid and accurate diagnosing a disease in an early stage but also minimizing the invasiveness of the diagnostic technique. Currently, metabolomics is used for the discovery of diagnostic biomarkers of various diseases, to better understand their complexity and monitor the metabolic biomarkers during therapeutic intervention. Metabolic profiling is usually defined as a qualitative analysis and quantification of the metabolites which are associated with particular path. This approach may also give clues to personalized treatments for various diseases by providing useful information about the response to treatment. Lipids play many important roles in disease processes and lipidomics is a specialized subset of metabolomics. A prerequisite for the clinical use of biomarker is standardization of analytical methods used to metabolic profiling. In the last few years dozens of papers have been published on application of separation techniques coupled to mass spectrometry or nuclear magnetic resonance to identification biomarkers of several diseases. Although impressive improvements have been observed methodological challenges are still running. Therefore, the aim of this thematic issue is to present a recent development in the application of separation and hyphenated techniques with different detection mode in current diagnostic challenges.

The scope of this issue focuses on the strategies and current challenges in metabolomics in prostate cancer; cardiology, ocular diseases, steroid metabolomics and personalized medicine; direct biomarkers of alcohol consumption; applications of electronic noses in medical diagnostics; current progress of lipid analysis in metabolic diseases, as well as application of chromatography coupled to mass spectrometry to microorganisms detection; vitamins analysis in biological matrices, application of liquid chromatography coupled to NMR as a diagnostic tool.

Keywords: Metabolomics; diagnostic biomarkers; steroid metabolomics and personalized medicine; NMR

Subtopics:

The subtopics to be covered within this issue are listed below:

1. Advances in the application of separation techniques in current diagnostic challenges
2. Challenges and strategies in metabolomics
3. Improvement in detection of microorganism and microbial infection
4. New trends in the breath analysis using electronic noses
5. LC-NMR as a diagnostic tool