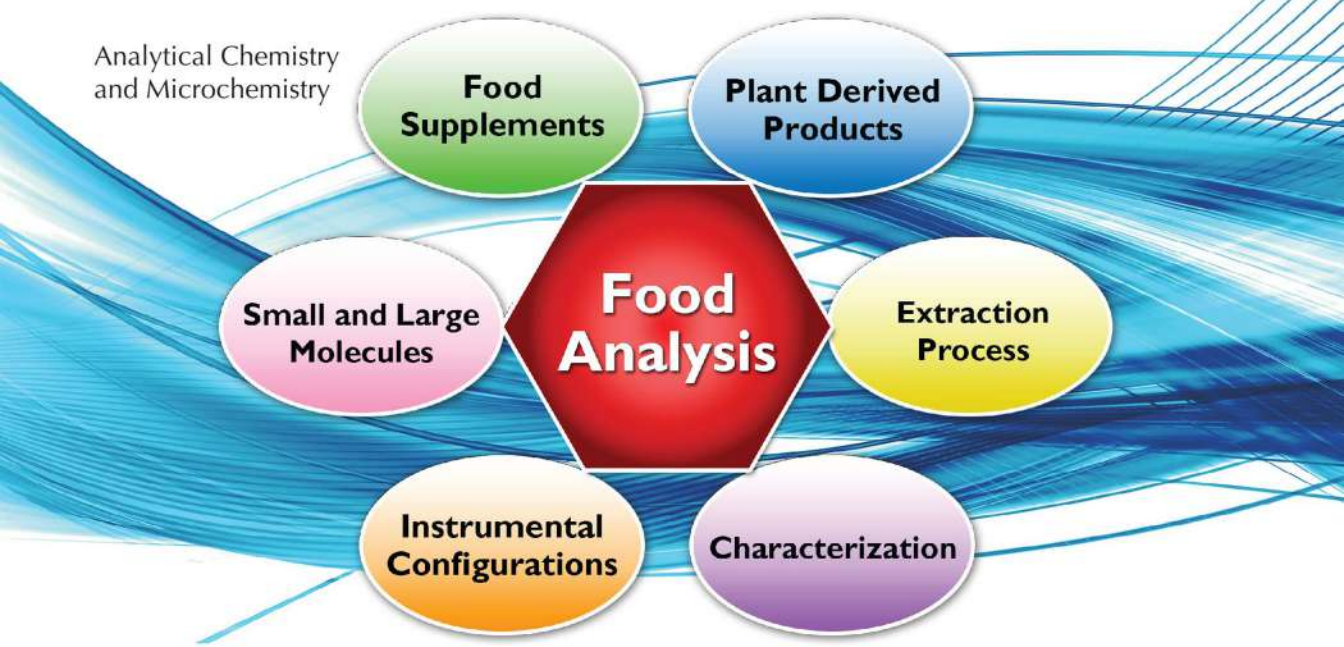
Analytical Chemistry

Developments, Applications and Challenges in Food Analysis



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Editors

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ANALYTICAL CHEMISTRY AND MICROCHEMISTRY

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DEVELOPMENTS, APPLICATIONS AND CHALLENGES IN FOOD ANALYSIS

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PREFACE

"Analytical Chemistry: Developments, Applications and Challenges in Food Analysis" represents a collection of book chapters showing the validation, and instrument set up of analytical methods that are used to analyze foods and their ingredients. The different chapters include several topics discussing the validation of analytical method, extraction procedures, and other multidisciplinary approaches for the analysis of foods, particularly supplements originated from plant raw materials. In these book chapters, we would like to collect different methods and tools to provide a multidisciplinary approach for the analysis of foods, their ingredients, natural and synthetic supplements. These procedures guarantee the quality and safety of food products, human healthcare, quality control, sophistications and potential contaminants of food derivatives.

The book includes several chapters discussing different topics; in particular, ***Chapter 1*** describes preliminary approaches to validate analytical methods, where authors report a complete and critical review of the state of the art regarding the validation processes according to the Internationally Guidelines of analysis. ***Chapter 1*** also included a detailed description of the various matrices that affect analysis by using the hyphenated techniques. ***Chapters 2*****,** titled "*Sample Preparation in Food Analysis: Practices, Problems and Future Outlook"* reports recently developed procedures for the extraction and clean-up from food matrices, particularly to reduce the major drawbacks in analytical chemistry as interferences and matrix effects, as also reported and highlighted in Chapter 1. ***Chapter 3*** includes innovative magnetic nanoparticles for the selective extractions of various compounds and derivatives from foods and their supplements. The use of magnetic nanoparticles in food analysis increases the selectivity of methods and improves the quality of analysis. ***Chapter 4*** reports a complete overview of principal phenolic constituents present in food supplements and their principal quantitative analyses determination. ***Chapter 5*** includes the use of NMR analysis in food derivatives and supplements. In particular, the authors describe advantages and disadvantages of NMR spectroscopy in the analysis of foods. ***Chapters 6*** and ***7*** include the applications of NMR spectroscopy in foods

and food supplements analysis and are a proceeding of ***chapter 5***. ***Chapter 8*** describes the voltammetry and atomic absorption spectroscopy for the analysis of toxic metals in seafood, and food supplements. ***Chapter 9*** includes the application of thermal techniques in foods and food supplements. ***Chapter 10*** includes the analysis of proteins in foods, and innovative approaches to isolate, purify and characterize proteins in foods and food supplements. Analytical chemists and researchers working in the field of validation methods, foods and food supplements, and using standard and innovative instruments to analyze products; and/or innovative extraction procedures, could be a potential audience of these chapters.

Dr. Marcello Locatelli and Prof. Cristiano Celia, professors at the "G. d'Annunzio" University of Chieti-Pescara at the Department of Pharmacy, have been curating this edition with the collaboration of Italian and foreign colleagues, internationally renowned in the field of analytical chemistry and analysis of food and nutritional supplements. Experts in the field of extraction techniques for quantitative analysis and new instrumental configurations that can also be adopted to provide an important contribution in order to obtain an up-to-date result with regard to the latest discoveries and applications in this field.

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