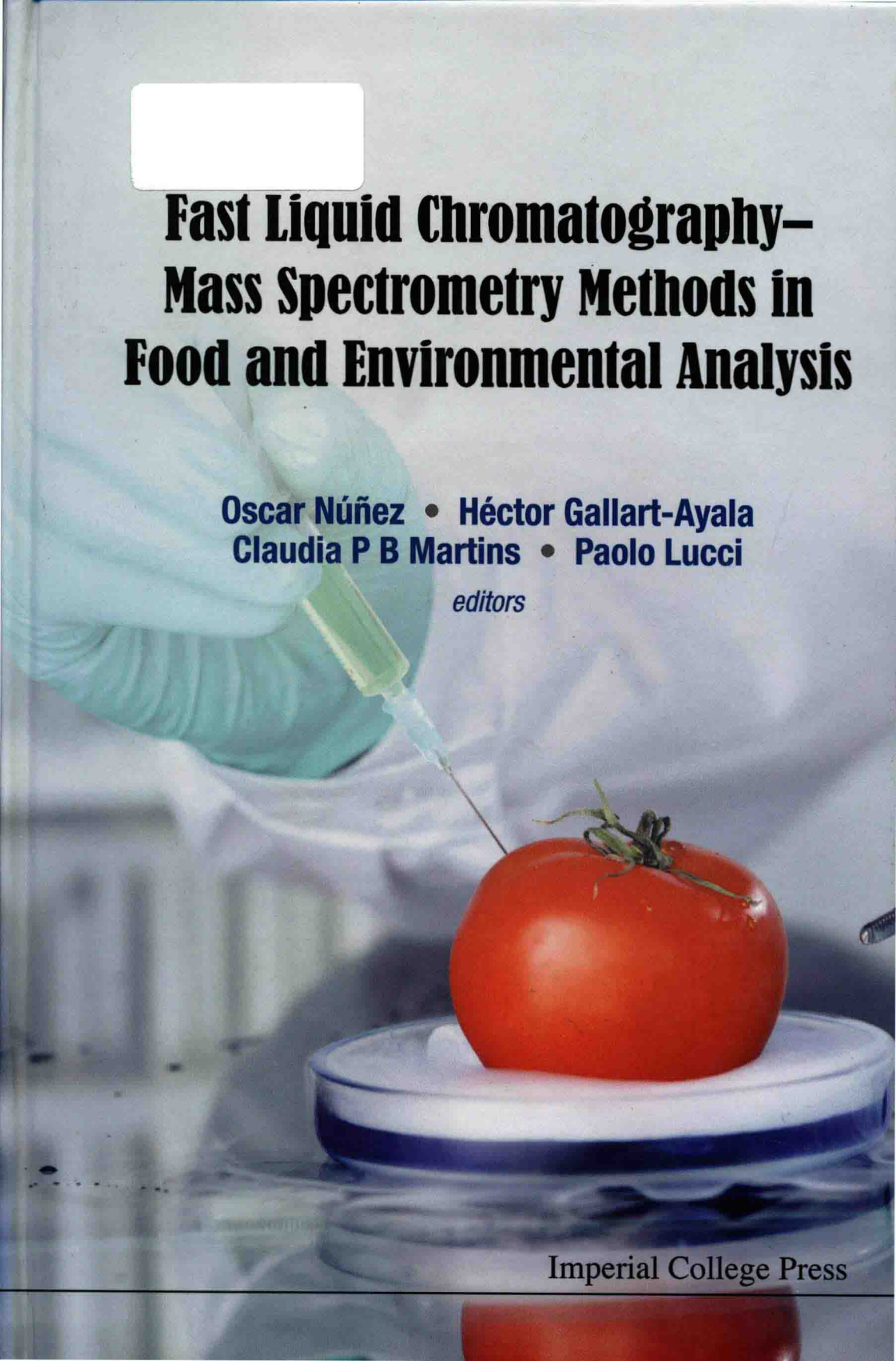
Fast Liquid Chromatography–Mass Spectrometry Methods in Food and Environmental Analysis

Oscar Núñez • Héctor Gallart-Ayala
Claudia P B Martins • Paolo Lucci
editors



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Editors

Oscar Núñez
University of Barcelona, Spain

Héctor Gallart-Ayala
ONIRIS-LABERCA, France

Claudia S. B. Martins
Thermo Fisher Scientific, France

Paolo Lucci
Pontificia Universidad Javeriana, Colombia

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Fast Liquid Chromatography–Mass Spectrometry Methods in Food and Environmental Analysis

Dedicated to Velhote
C. Martins

Dedicated to my parents,
Martina and Tiago
P. Lucci

Dedicated to my parents and sister
O. Núñez

"Learn from yesterday, live for today, hope for tomorrow. The important thing is not to stop questioning."

Albert Einstein

Preface

Liquid chromatography coupled to mass spectrometry is one of the most prominent techniques in analytical science. It has brought together a group of editors who, just like many of you, have been working (and struggling) in the development of liquid chromatography–mass spectrometry (LC–MS) methodology for the analysis of a variety of contaminants in food and environmental samples.

The story behind *Fast Liquid Chromatography–Mass Spectrometry Methods in Food and Environmental Analysis* goes back to 2012, when Oscar Núñez received an invitation to participate in the special issue *High-Performance Columns and Their Operations* published by Journal of Chromatography A and edited by Professor Nobuo Tanaka. The invitation to write a book on the same topic soon followed.

Our main objective was to address different methodologies concerning the use of fast liquid chromatography coupled to mass spectrometry in food and environmental analysis. In addition, some of the new trends such as on-line sample preparation, direct analysis and high resolution mass spectrometry are also discussed. We have tried to cover different aspects of the analytical workflow, including sample preparation, chromatographic separation

and mass spectrometry analysis, as well as quantification and confirmatory strategies in three main sections:

(i) Novel approaches to achieve fast and ultrafast separations (ultrahigh-pressure liquid chromatography (UHPLC) with sub-2 μm and core-shell particles, monolithic columns and high temperature) and the use of complementary stationary phases, such as HILIC and perfluorinated reversed phases;
(ii) On-line sample treatment procedures — On-line Solid Phase Extraction, Molecular Imprinted Polymers and Turbulent Flow Chromatography — coupled to fast liquid chromatography, direct analysis (including desorption electrospray ionization (DESI) and direct analysis in real time (DART)) and the use of liquid chromatography high resolution mass spectrometry;
(iii) Relevant LC–MS applications focusing on the analysis of different groups of contaminants, including pesticides, mycotoxins, food packaging contaminants, perfluorinated and polyphenolic compounds.

This book compiles the work of many authors who are considered experts on many of the topics covered. We would like to acknowledge their work, time and brilliant contributions to this book.

Oscar Núñez
Héctor Gallart-Ayala
Cláudia P.B. Martins
Paolo Lucci

November 2014

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