

# Preface

This ACS Symposium Series Book comes from the ACS symposium “Chemistry & Biological Activities of Phenolic Compounds from Fruits & Vegetables”, sponsored by the Division of Agricultural and Food Chemistry at the 253rd American Chemical Society National Meeting & Exposition in San Francisco, California, April 2–6, 2017. Diverse researchers in this field, including 42 scientists from 17 countries, came from all over the world to exchange ideas and results on food composition and analysis, HPLC separation, mass spectrometry, *in vitro* tests, *in vivo* studies, and human clinical trials. A world-class group of academic researchers and industrial scientists wrote the chapters published in this book to provide a state-of-the-art review and global perspective on this rapidly growing area of research.

The growing number of scientific studies that have shown the ubiquitous occurrence of phenolics in plants, and their beneficial roles in human health, have driven increased public interest in the varied phenolic compounds present in fruits and vegetables since the '90s. More than 150,000 studies have appeared in the literature over this time span; this figure is doubtless an underestimate, due to the inherently heterogeneous nature of this topic, which intersects botany, chemistry, biology, pharmacology, and medicine. Epidemiological studies have shown that many phenolic derivatives possess strong antioxidant and radical scavenging activity, are associated with reduced risk for certain chronic diseases, and prevent some cardiovascular disorders and certain kinds of cancers. Moreover, polyphenols demonstrated for antiviral, antimicrobial, anti-inflammatory, antiulcer and anti-allergenic properties. The food industry, academia, and research institutions have invested considerable resources in this research. The interest in polyphenols has been also fueled by the current and growing awareness of healthy lifestyles and the beneficial effects that derive from the dietary intake of particular nutrients. As a result, the polyphenols containing nutraceutical and dietary supplements market is in high demand, with an estimated global value an about \$750 million in 2015, and is expected reach up to \$1.1 billion by end of 2022. The use of polyphenols as an ingredient for functional beverages in the health care, sports, and entertainment sector is one of the key factors for driving the growth of the polyphenols industry.

Presently, the diverse researchers of the phenolics community invest their time and energy in a broad range of activities from the isolation and identification of new phenolic compounds from plant materials to the study of the effect and mechanism of action of known and novel phenolics *in vitro* and *in vivo*. Reflecting this diversity, the symposium covered widespread topics, with outstanding contributions ranging from isolation and identification of naturally occurring

bioactive compounds, to the understanding of their health benefits. This rich variety led us to organize the sessions, and the chapters of this book, in a thematic fashion following the ideal journey of a phenolic molecule from the plant to the human body:

- Isolation, Food Composition, & Antioxidant Activity
- HPLC Separation, Mass Spectrometry & Antioxidant Activity
- Mass Spectrometry & *In Vitro* Biological Activities
- *In Vitro* Studies
- *In Vivo* Studies
- *In Vivo* & Human Clinical Trials

This book comprehensively describes the information presented at the ACS symposium “Chemistry & Biological Activities of Phenolic Compounds from Fruits & Vegetables”, providing a current review that will be useful for scientists, researchers, teachers, and engineers in general, and is particularly useful for chemists, biochemists, chemical engineers, biochemical engineers, and others in chemistry-related fields.

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