

# Preface

Ethylene, the first identified gaseous hormone, has commercial importance in agriculture and profound effects on various aspects of plant processes throughout the life cycle. Extensive studies have been performed to unravel mechanisms of ethylene actions, with application to agricultural practices. Historical breakthroughs in ethylene study are (1) the identification of ethylene as a gaseous hormone, (2) biochemical elucidation of the coupling of methionine recycling (the Yang cycle) and ethylene biosynthesis, and (3) isolation of ethylene-forming enzymes and the corresponding genes to validate the biochemically deduced pathway.

In the past two decades, rapid and significant advances have led to the understanding of ethylene signal transduction and regulation of its biosynthesis, with isolation of the involved components and studies of the underlying mechanisms. Moreover, dissecting hormone signaling crosstalk and interactions at the molecular level has furthered our knowledge about the networking of ethylene with other plant growth substances in response to external and internal cues.

This book represents the vast expertise of researchers devoted to research into this important molecule. It describes the historical breakthroughs in the role of ethylene to provide background knowledge. In addition, it highlights significant advances in ethylene signaling, biosynthesis and its crosstalk as well as interactions with other stimuli to emphasize significant breakthroughs in the field. Evolutionary perspectives of ethylene as a plant hormone are addressed. Finally, the ethylene research tools outlined may facilitate ethylene studies inside and outside of the field.

This book is conceptually divided into four parts: Chap. 1 for ethylene biosynthesis and its regulation, Chaps. 2–6 for ethylene signaling, Chaps. 8–11 for the networking of ethylene with other signals, and Chaps. 12–14 for ethylene research tools. Chapter 7, not in the four categories, involves ethylene biosynthesis and signaling from an evolutionary perspective.

The chapter authors have been very active in related areas, with pioneering contributions that have made significant advances in the field. As the Editor of the book, I extend my gratitude to all the authors, whose efforts and invaluable contributions have made the book possible and regret that we could not include contributions from experts in related fields.

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