Preface

It has been several decades since Skoog and Miller described the contrasting behavior of auxin and cytokinin in influencing the growth of root and shoot in plants. Since then, a profound understanding concerning the implications of auxin and cytokinin for plant growth and development has been achieved. Complex processes such as the maintenance of stem cell in niches such as root apical meristem, shoot apical meristem, and lateral root meristems have recently been unearthed. Robust stem cell signaling networks, leaf position determination, and emergence of leaf primordia, lateral root formation, and de novo hormone-induced organogenesis are the processes that are stringently fine-tuned by a balance between auxin and cytokinins in plants.

More intriguingly, for various plant processes synergistic and antagonistic interactions have been demonstrated for auxin and cytokinins. Auxin exerts its inhibition on cytokinins at several levels; mechanisms range from its biosynthesis to the suppression of its signaling. Reciprocally, cytokinins antagonistically impact the flux, distribution, and signaling of auxin. Not only in growth and development but both these hormones have recently been shown to modulate plant regulatory networks that govern the adaptation of plants to biotic and abiotic stresses. The interaction between cytokinin and salicylic acid and that of auxin and jasmonate have opened new avenues in the study of plant-pathogen interactions. Furthermore, reports also highlight the emerging role of cytokinin in abiotic stresses as well as its crosstalk to stress hormone abscisic acid.

All these groundbreaking discoveries concerning the biology of auxin and cytokinins are by the virtue of dedicated efforts made by the plant science community. Besides phenomenal description of these important plant hormones in many publications, a methodological focus on tools, assays, and techniques that enhance our understanding of the functional role of auxin and cytokinins is worth a special compilation. To accomplish this task, we aimed at collecting vital protocols with their background information as well as potential applications in the form of this volume of Methods in Molecular Biology (MiMB). We are thankful to our humble authors who did spare time and efforts to contribute to this timely topic of plant biology. We hope that this volume will provide a unique opportunity to plant scientists, graduate and undergraduate students in adopting these vital methods in addressing their biological questions pertinent to the functional implications of auxin and cytokinins.

Würzburg, Germany — *Thomas Dandekar*
Würzburg, Germany — *Muhammad Naseem*

http://www.springer.com/978-1-4939-6829-9

Auxins and Cytokinins in Plant Biology
Methods and Protocols
Dandekar, Th.; Naseem, M. (Eds.)
2017, X, 204 p. 31 illus., 23 illus. in color. With online files/update., Hardcover
ISBN: 978-1-4939-6829-9
A product of Humana Press