tissue cultures at different stages, or in vitro derived plants. Unfortunately, the pictures are all in black and white. I feel that it would have been beneficial to have some of the pictures in colour, especially the ones illustrating callus or suspension cultures.

In conclusion, I would recommend this book to researchers and students working in the area of plant tissue culture and biochemical analysis. This book would also be beneficial as a text book or laboratory manual in plant tissue culture courses.

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Plant Hormones. Methods and Protocols, 2nd edn

Within the past 10 to 20 years, significant progress has been made in the field of plant science, especially within the field relating to the biochemical, molecular, cytological and genetic mechanisms of plant hormones. This success is mainly due to substantial advances in molecular genetics and improvements of biochemical methods, as well as because accurate and highly sensitive determination methods for plant hormone molecules have become available. Against such a background, this book introduces several approaches essential for plant hormone biology at the forefront of research.

Chapter 1 is entitled ‘Using reverse genetics to develop small knockout collections for specific biological questions’. Because in Arabidopsis T-DNA knockout (KO) lines cover almost all genes, designed KO lines of gene groups, such as for genes in the same gene family, some phenotype or physiological phenomena-related gene groups, and specific genes functionally classified in the same genes (for example ‘protein kinase’), can be easily collected from SALK T-DNA lines. This strategy has always been popular, but the desired reverse genetic method concomitant with accumulating genome information and ordered T-DNA collections will lead us at step further in the direction of plant hormone analysis.

Once PIN proteins were characterized as an auxin transport, plant researchers moved to see routes and networks of auxin flow in some organs or the whole plant. In chapter 2 (‘Visualizing auxin transport routes in Arabidopsis leaf primordia’), therefore, the methods for visualization of PIN protein localization and its transitional changes affected by environmental stimuli and also along the developmental processes of plant growth are described. In chapter 3 (‘Gene expression analyses for elucidating mechanisms of hormonal action in plants’), with regard to the increasing genomic information available, mainly in Arabidopsis, an guide is given for the way to use the data sets of gene expression that are available in several databases for monitoring gene expression profiles, finding co-expressed genes and searching for possible cis-elements in promoter regions. Chapters 4 and 5 (‘Measurement of plant hormones by liquid chromatography–mass spectrometry’ and ‘Measurement of abscisic acid and gibberellins by gas chromatography/mass spectrometry’, respectively) introduce accurate and sensitive quantification methods for plant hormones using LC–MS/MS (to determine abscisic acid and related metabolites including glucose conjugations from approx. 50 mg of plant sample) and GC–MS (abscisic acid and gibberellins from 0.1–1.0 g of plant sample using the same extraction method), respectively. In chapters 6 to 10, how to isolate and access the real binding and functioning of hormone receptors is explained for auxin, abscisic acid, brassicosteroid (BR) and cytokinin receptor/binding proteins. Excellent examples are introduced for a ‘pull-down assay’ for the auxin-receptor (TIR1)-repressor (AUX/IAA) complex (chapter 6); for BRI1 (chapter 7) and ABA (chapter 8) binding assays using 3H-labelled BR and ABA, respectively; for a functional assay for cytokinin using yeast cells (chapter 9); and using bacterial systems (chapter 10). Acknowledging the increasing important roles of miRNAs and chemical genomic approaches even in plant hormone biology, chapter 11 deals with a search for new microRNA members by deep parallel sequencing, and chapter 12 introduces a typical example of a chemical genomic study to isolate new components for auxin-dependent responses and endomembrane trafficking systems (‘The use of chemical genomics to investigate pathways intersecting auxin-dependent responses and endomembrane trafficking in Arabidopsis italiciana’).

This book has been published at an apt time for plant hormone biologists, especially for PhD students and advanced researchers in this field, to move the field to a higher stage and to lead them towards wider and more advanced technical approaches to hormone analyses, to encourage them to accumulate more specific genomic information and to apply more sophisticated analytical tools. I would like to express my strong support for the next stage, of tightly organized collaboration where each and every special technique and skill is combined to unveil the dynamic biological system of a whole plant continuously moving and changing according to the time and space of nature.

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Photosynthesis in silico. Understanding complexity from molecules to ecosystems

Understanding photosynthetic complexity is a big task, especially when the range is from molecules to ecosystems and the means of advancing it is in the form of mathematical analyses, including simulation models and flux-control analysis. However, this collection of review chapters