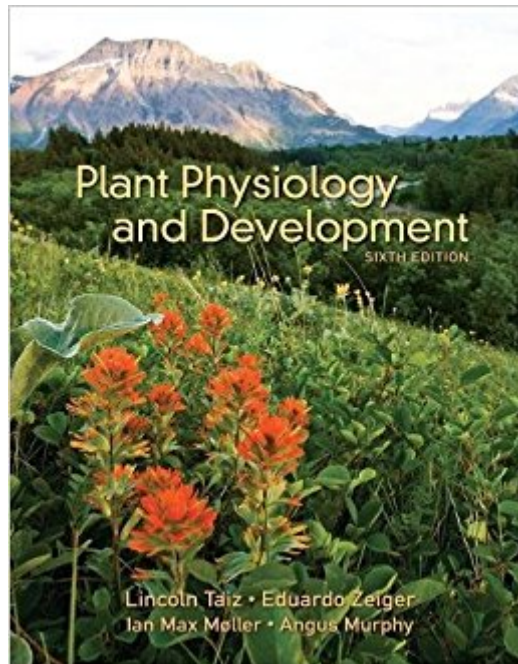


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Plant Physiology And Development



Synopsis

Throughout its twenty-two year history, the authors of *Plant Physiology* have continually updated the book to incorporate the latest advances in plant biology and implement pedagogical improvements requested by adopters. This has made *Plant Physiology* the most authoritative, comprehensive, and widely used upper-division plant biology textbook. In the Sixth Edition, the Growth and Development section (Unit III) has been reorganized and expanded to present the complete life cycle of seed plants from germination to senescence. In recognition of this enhancement, the text has been renamed *Plant Physiology and Development*. As before, Unit III begins with updated chapters on Cell Walls and Signals and Signal Transduction. The latter chapter has been expanded to include a discussion of major signaling molecules, such as calcium ions and plant hormones. A new, unified chapter entitled Signals from Sunlight has replaced the two Fifth-Edition chapters on Phytochrome and Blue Light Responses. This chapter includes phytochrome, as well as the blue and UV light receptors and their signaling pathways, including phototropins, cryptochromes, and UVR8. The subsequent chapters in Unit III are devoted to describing the stages of development from embryogenesis to senescence and the many physiological and environmental factors that regulate them. The result provides students with an improved understanding of the integration of hormones and other signaling agents in developmental regulation. The new organization of Unit III has the added benefit that it minimizes redundancy, making it possible to reduce the number of chapters in the Unit from 13 to 11. Angus Murphy of the University of Maryland has headed up a team of authors and editors to implement the revision. Ian Max Møller has subsequently edited all the book chapters to ensure an even high quality and consistency level. In addition to the organizational changes noted above, two new chapters on stress are included: *A new chapter titled Biotic Interactions--replacing the Fifth-Edition Chapter 13 on Secondary Metabolites and Plant Defense--discusses the integrated signaling responses to a spectrum of biological agents.* A completely rewritten chapter on Abiotic Stress discusses the use of genomics, systems biology, imaging, and bioinformatics tools in the study of abiotic stress. Recent efforts to develop drought-tolerant maize and flood-tolerant rice are described, as well as the role of ABA receptors, newly-identified regulatory networks, epigenetic changes in response to abiotic stress, and rapid systemic signaling. The Sixth Edition of *Plant Physiology and Development* also includes updated and improved versions of the physiological chapters in Units I and II. A new chapter on Stomatal Biology has been added to Unit II. The chapters on Mineral Nutrition and Assimilation of Inorganic Nutrients feature a new treatment of nitrogen metabolism: *Ammonium and nitrate are often lumped together as inorganic nitrogen although their influences on plants are quite different, almost like two

different elements. These two forms of nitrogen are therefore treated separately in the Sixth Edition.*The pathway of all nutrients essential in the human diet begins with plant roots "mining" the soil for mineral elements; the Sixth Edition explicitly examines the linkage between plant nutrition and human health.*The response of plants to rising atmospheric levels of carbon dioxide depends most strongly on their nitrogen status. The Sixth Edition describes the newly discovered mechanism for this dependence and how it will influence food quality in the future.*Exciting new findings on the mechanisms of mycorrhizal associations and symbiotic nitrogen fixation will be added, providing insights about the interdependence of plants and microorganisms. The goal, as always, is to provide the best educational foundation possible for the next generation of plant biologists.

RESOURCES

For the Student

COMPANION WEBSITE The Plant Physiology and Development Companion Website (available free of charge) includes a rich collection of material that enhances the textbook's coverage on a wide range of topics. Web Topics and Web Essays are referenced throughout the textbook. The site includes the following resources for each chapter of the textbook:

- *Web Topics: Text, boxes, and illustrations elaborating on selected topics
- *Web Essays: Discussions of cutting-edge research topics, written by those who do the research
- *Study Questions
- *Literature Cited

For the Instructor

INSTRUCTOR'S RESOURCE LIBRARY The Plant Physiology and Development Instructor's Resource Library includes all of the textbook's figures (both art and photographs) and tables in electronic format. All images are provided in both JPEG (high- and low-resolution versions) and ready-to-use PowerPoint presentations. The figures have all been formatted and color-enhanced for optimal projection in the classroom.

Book Information

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Lincoln Taiz is Professor Emeritus of Molecular, Cellular, and Developmental Biology at the University of California at Santa Cruz. He received his Ph.D. in Botany from the University of California at Berkeley in 1971. Dr. Taiz's main research focus has been on the structure, function, and evolution of vacuolar H⁺-ATPases. He has also worked on gibberellins, cell wall mechanical properties, metal tolerance, auxin transport, and stomatal opening. Eduardo Zeiger is Professor Emeritus of Biology at the University of California at Los Angeles. He received a Ph.D. in Plant Genetics at the University of California at Davis in 1970. His research interests include stomatal function, the sensory transduction of blue-light responses, and the study of stomatal acclimations associated with increases in crop yields. Ian M. Møller is Associate Professor of Molecular Biology and Genetics at Aarhus University, Denmark. He received his Ph.D. in Plant Biochemistry from Imperial College, London, UK. He has worked at Lund University, Sweden and, more recently, at Risø National Laboratory and the Royal Veterinary and Agricultural University in Copenhagen, Denmark. Professor Møller has investigated plant respiration throughout his career. His current interests include turnover of reactive oxygen species and the role of protein oxidation in plant cells. Angus Murphy has been Professor and Chair of the Department of Plant Science and Landscape Architecture at the University of Maryland since 2012. He earned his Ph.D. in Biology from the University of California at Santa Cruz in 1996 and moved to Purdue University as an assistant professor in 2001. Dr. Murphy studies ATP-Binding Cassette transporters, the regulation of auxin transport, and the mechanisms by which transport proteins are regulated in plastic plant growth.

a very nice book, i use this for my class, its an amazing book with deep explanation , plus there more added essays and results on their website.

Great diagrams and illustrations.

very nice and detailed. would definitely recommend, although they do not go as deeply into secondary metabolites as they should.

As a botanist this is a precious book, up to dated, very important to me.

If you are a botanical student you should definitely BUY THIS!!! TOP NOTCH!!!

Clear and comprehensive. The looseleaf is inconvenient, I prefer hard cover.

Received in beautiful condition.

The book is great and very well-presented and organized.

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