

Aro, E.-M., Andersson, B. (ed.): **Regulation of Photosynthesis**. — Kluwer Academic Publishers, Dordrecht – Boston – London 2001. ISBN 0-7923-6332-9. XVIII + 7 + 613 pp., USD 226.00, € 260.00, GBP 159.00.

The well-known book series “Advances in Photosynthesis” is, starting with this volume, re-named to “Advances in Photosynthesis and Respiration”. This broadening of contents is connected also with the appointment of new members of the Board of Consulting Editors. The newcomers are C. Foyer, E. Gantt, J.H. Golbeck, S. Golden, W. Junge, H. Michel, and K. Satoh. They, together with Govindjee, the Series Editor, and somebody working mainly in respiration research hope to continue in preparing books that will be basic for every library in plant sciences research and teaching. Five forthcoming books are already being prepared.

Volume 11 is dedicated to regulation of both photosynthetic bioenergetics and carbon metabolism. These processes are affected by abiotic and biotic stresses that are imposed on plants. Nevertheless, the 32 chapters that form this book are arranged not according to these factors but more according to the synthesis, adaptation, acclimation, and genomics of the photosynthetic apparatus. Especially genetics prevails in some chapters in which papers published in photobiological journals are cited only rarely.

The 32 chapters (almost all written by known authors) are grouped into six parts. Part I (1 chapter) is on thylakoid biogenesis and dynamics as a result of phylogenesis of photosynthesis. Next part (7 chapters) is entitled “Gene expression and signal transduction”. Its chapters deal with plastid- and nuclear-encoded plastid RNA polymerases, roles of phytochrome and other photoreceptors in the regulation of gene expression, regulation of synthesis of photosystem of purple photosynthetic bacteria, redox regulation of photosynthetic genes, regulation (by sinks and sugars) of photosynthetic carbon metabolism, editing, polyadenylation, and degradation of chloroplast mRNA, and regulation of translation in chloroplasts. Part III (8 chapters) contains reviews on proteins involved in biosynthesis of the thylakoid membrane, peptidyl-prolyl isomerases, role of plastid envelope in the biosynthesis of chloroplast lipids, assembly of chlorophyll-protein complexes, their synthesis, transport, and binding, chlorophyll biosynthesis in defence against photo-oxidative stress, transport of metal ions functioning in oxygenic photosynthesis (Fe, Cu, Mn, Zn, Mg), chloroplast proteases and proteolysis, and leaf senescence and cell death.

Part IV, “Regulation of carbon metabolism” (5 chapters), explains control, regulation, and productivity of photosynthetic carbon fixation, functions of carbonic anhydrases (3 types) in chloroplasts, involvement of thioredoxin and glutaredoxin in redox regulation, the

photosynthetic ferredoxin/thioredoxin system, and reversible phosphorylation of photosynthetic phosphoenolpyruvate carboxylase. Part V (9 chapters) deals with various aspects of plant acclimation and stress responses. The chapters analyse photoinhibition, photodamage, and D1 protein turnover, protein phosphorylation and its regulation, the violaxanthin/zeaxanthin cycle, the specific PsbS protein in photosystem 2 and its possible functions, redox sensing of photooxidative stress, the Elip (early light-induced proteins) stress proteins, the regulation, inhibition, and protection of photosystem 1 and of the whole photosynthetic electron transport. The last part (2 chapters) is only loosely connected with photosynthesis: results of functional genomics in *Synechocystis* sp. PCC6803 (in various experiments often used model cyanobacterium) and *Arabidopsis* (genetic plant model organism chosen for genome sequencing) are shown here.

All chapters bring comprehensive information on the given topics, based mainly on recent literature (from 17 to 232 references per chapter, mostly 100-150 items) and clearly explaining new facts. I appreciate that new approaches, prospects, and outlooks end many of the chapters. Nevertheless, the physiological side of research is sometimes shown only as a background. Very useful is information arranged in comprehensive tables and models. Some of the models are presented on seven colour plates. A detailed subject index is supplemented. I always regret that full author indexes are not supplemented to such books: they would be a welcome source when looking for exact citation of some paper. I understand that such an index would immensely increase the number of pages of the book, nevertheless, why not present it (gratis) on the net? The difficulty with authors' names is that sometimes papers are authored by vast amount of researchers. An example of this may be found on p. 589. The paper of Mayer *et al.* on sequencing of chromosome 4 of *Arabidopsis* (Nature 402: 769-777, 1999) was written (really?) by 229 scientists!

An advantage of the book is that it embraces all photosynthesizing organisms and shows also phylogenetic principles. The editorial work was excellent, nevertheless, I would recommend not to use common abbreviations for another substance: thus (Chapter 2) everybody knows that PEP means phosphoenolpyruvate, then why to use PEP for plastid RNA polymerase?

It is probably needless to say that also this book belongs to the basic library of any team and institution dealing with photosynthesis.

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