Aro, E.-M., Andersson, B. (ed.): **Regulation of Photosynthesis.** (Advances in Photosythesis and Respiration. Volume 11.) - Kluwer Academic Publishers, Dordrecht - Boston - London 2001. 613 pp. EUR 260.00. ISBN 0-7923-6332-9.

The present volume is a sequel to ten volumes of the Kluwer series "Advances in Photosynthesis", published in 1994 - 2001. The scope of the following series "Advances in Photosynthesis and Respiration" – edited by Govindjee – provides a comprehensive and state-of-the-art account of research in photosynthesis and respiration (forthcoming themes: light-harvesting antennas in photosynthesis; photosynthesis in algae; photosynthetic nitrogen assimilation and associated organic acid metabolism; chlorophyll *a* fluorescence: a signature of photosynthesis; photosystem II: the water/plastoquinone oxido-reductase in photosynthesis).

The new volume of the series, Volume 11, is devoted to a critical area of photosynthesis, regulation, which is the key for the optimum functioning of photosynthesis, and for dealing with both the abiotic (temperature, CO_2-deficiency, drought, and even light) and biotic (pathogens) stresses that are imposed on the plants. The book contains 32 chapters prepared by 62 specialists from 10 countries [Finland (3), France (6), Germany (6), Israel (4), Italy (2), Japan (5), Sweden (16), Switzerland (3), UK (2), and USA (15)].

The chapters are arranged in 6 parts. Part I devoted to evolution, complexity and regulation of photosynthetic structures contains only one chapter dealing with thylakoid biogenesis and dynamics. Part II (7 chapters) is devoted to gene expression and signal transduction (plastid RNA polymerases in higher plants, phytochrome and regulation of photosynthetic gene expression, regulating synthesis of the purple bacterial photosystem, redox regulation of photosynthetic genes, sugar sensing and regulation of photosynthetic carbon metabolism, editing, polyadenylation and degradation of mRNA in the chloroplast, regulation of chloroplast translation).

Biogenesis, turnover and senescence is dealt with in 8 chapters of the Part III (proteins involved in biogenesis of the thylakoid membrane, peptidyl-prolyl isomerases and regulation of photosynthetic functions, role of the plastid envelope in the biogenesis of chloroplast lipids, pigment assembly transport and ligation, chlorophyll bio-genesis –metabolism and strategies of higher plants to avoid photooxidative stress, transport of metals: a key process in oxygenic photosynthesis, chloroplast proteases and their role in photosynthesis regulation, and senescence and cell death in plant development: chloroplast senescence and its regulation).

Part IV (5 chapters) summarises the regulation of carbon metabolism (dynamics of photosynthetic CO_2 fixation: control, regulation and productivity, chloroplastic carbonic anhydrases, thioredoxin and glutaredoxin: general aspects and involvement in redox regulation, the structure and function of the ferredoxin/thioredoxin system in photosynthesis, reversible photophosphorylation in the regulation of photosynthetic phospho*enol*pyruvate carboxylase in C_4 plants).

Nine chapters of the Part V focuse on acclimation and stress responses (photodamage and D1 protein turnover in photosystem 2, phosphorylation of photosystem 2 proteins, novel aspects on the regulation of thylakoid protein phosphorylation, enzymes and mechanisms for violaxanthin-zeaxanthin conversion, the PsbS protein: a Cab-protein with a function of its own, redox sensing of photooxidative stress and acclimatory mechanisms in plants, the Elip family of stress proteins in the thylakoid membranes of prokaryota and eukaryota, regulation, inhibition and protection of photosystem I, regulation of photosynthetic electron transport).

Part VI (2 chapters) presents perspectives of studies of photosynthetic regulation and genomics, namely methodological implications for the future (functional genomics in *Synechocystis* sp. PCC6803: resources for comprehensive studies of gene function and regulation, *Arabidopsis* genetics and functional genomics in the post-genome era).

The book, well edited and produced, is accompanied with a comprehensive subject and plant index. References to relevant literature are included into individual chapters (altogether almost 4000 references). The book brings useful information on different aspects of regulation in photosynthesis. I can recommend it to advanced undergraduate students, postgraduate students, teachers, and scientists in the field of biochemistry and plant biology, namely molecular and cellular biology, integrative biology, and stress biology.

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