

Rochaix, J.-D., Goldschmidt-Clermont, M., Merchant, S. (ed.): **The Molecular Biology of Chloroplasts and Mitochondria in *Chlamydomonas***. - Kluwer Academic Publishers, Dordrecht - Boston - London 1998. ISBN 0-7923-5174-6 (hardback). 733 pp., NLG 595.00, USD 320.00, GBP 199.00.

Chlamydomonas is a species of green algae, very often used in photosynthesis research because the genetics of its chloroplasts has been recognised in detail during the past 20 years. Therefore the thickness of the reviewed book (volume 7 of the series *Advances in Photosynthesis*) that is dedicated exclusively to *Chlamydomonas* photosynthesis does not surprise any photosynthesis researcher.

The book consists of 36 chapters written mostly by well-known scientists in the field. General aspects (cell architecture, life cycle, genetics, laboratory strains) are the topic of the introductory chapter (E.H. Harris). Results of the research in this field from the second half of the 1960s to the early 1970s are reviewed by R.K. Togasaki and S.J. Surzycki. Chapters 3 and 4 are on the organisation (C.D. Silflow) and transformation (K.L. Kindle) of the nuclear genome of *Chlamydomonas*. Chloroplast and mitochondria genomes, their evolution, inheritance and transformation patterns, and cDNA are topics of the following four chapters (A.M. Nedelcu and R.W. Lee; E.V. Armbrust; B.B. Sears; M. Goldschmidt-Clermont). Chloroplast RNA synthesis, processing, stability, and splicing are reviewed in chapters 9 to 11 (J. Nickelsen; D.B. Stern and R.G. Drager; D.L. Herrin *et al.*). Next chapters deal with the regulation of chloroplast translation (C.R. Hauser *et al.*) and chloroplast protein translocation (M.C. Perret *et al.*).

Chapter 14 is on supramolecular organisation of chloroplast membranes, including photosystems and the main enzymes (J. Olive and F.-A. Wollman). Photosystem (PS) 2 is dealt with in the next two chapters: its assembly (J.M. Erickson) and functional analysis (S.V. Ruffle and R.T. Sayre). Structure and function of PS1 is the topic of chapter 17 (A.N. Webber and S.E. Bingham). Chapter 18 (K. Redding and G. Peltier) deals with an important question: Is photosystem 1 required for oxygenic photosynthesis in *Chlamydomonas*? (The answer is: Yes.) The assembly of light-harvesting systems is explained by J.K. Hooper *et al.*

Comparison, biosynthesis, and functions in chloroplasts are the topics of chapters that deal with chlorophylls, heme, and carotenoids (M.P. Timko) and glycerolipids (A. Trémolières), cytochrome *b₆f* complexes (F.-A. Wollman), ATP synthase (H. Strotmann *et al.*), ferredoxin/thioredoxin system (J.-P. Jacquot *et al.*), and plastocyanin and cytochromes (S. Merchaut). Chapters 22 and 23 deal with methods for measuring algae photosynthetic activity *in vivo* (P. Joliot *et al.*), and fluorescence and delayed luminescence by digital imaging procedure (P. Bennoun and D. Béal). Chapter 27 (R.J. Spreitzer) is on genetic engineering of ribulose-1,5-bisphosphate carboxylase/oxygenase. Chapter 28 (M.H. Spalding) deals with CO₂ concentrating mechanisms and acclimation to carbon availability. Chapter 29 (S.G. Ball) deals with regulation of starch biosynthesis. Next chapter is on the phenomenon of state transition in connection with photoinhibition (N. Keren and I. Ohad). Chapter 32 (J.P. Davies and A.R. Grossman) deals with the effects of macronutrient deficiency, chapter 33 (Fernandez *et al.*) with the regulation of nitrogen assimilation, and chapter 34 with mitochondrial genetics. A review on chlororespiration (P. Bennoun) and perspectives of *Chlamydomonas* research (L.J. Mets and J.-D. Rochaix) close the volume.

The amount of reviewed literature is terrific, and, certainly, specialists in this field will find most chapters very interesting. The book is also a good source of references and therefore an author index (in addition to the detailed subject index) would certainly be welcome. On the contrary, such index would increase the number of pages and its price. Some chapters (*e.g.*, 15, 16, 17) are interesting also for a general photosynthesis researcher, for whom some other chapters bring too many details. I also think that the lay-out of the monograph is not perfect, *e.g.*, the chapters on methods are put in between chapters on glycerolipids and cytochromes, and also the chapters dealing with individual components of chloroplast are not arranged in a logical sequence. Nevertheless, preparation of such voluminous book was certainly very demanding and it is fine that the series of specialised monographs in photosynthesis continues to appear.

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