

P. Mathis (ed.): **Photosynthesis: from Light to Biosphere**. Vol. 3. - Kluwer Academic Publisher, Dordrecht - Boston - London 1995. 1050 pp. ISBN 0-7923-3859-6.

The book is the third part of voluminous five-volume Proceedings of the Xth International Photosynthesis Congress, which took place in Montpellier, France, 20-25 August 1995.

Volume three consists of as much as six chapters of 24 total. They are numbered from the first volume: 9. ATPase, protons and energy transduction. 10. Organisation of the photosynthetic apparatus. 11. Expression and regulation of genes: prokaryotes. 12. Expression and regulation of genes: eukaryotes. 13. Protein translocation and assembly. 14. Biosynthesis of tetrapyrroles; lipid metabolism.

Chapter 9 contains 48 articles which span from evolution of ATPase through its structure and characterisation to functional studies. The interaction among enzyme subunits and the influence of several cofactors, namely metals, as well as the effect of several inhibitors are described. Unavoidably, the regulation of ATPase activity was studied by several authors. This enzyme was studied in bacteria, algae and higher plants. Also the process of photophosphorylation *in vivo* is involved. Interestingly, approach of molecular biology is quite rare this topics.

Next 54 contributions of the chapter 10 cope with the organisation of photosynthetic apparatus. This represents compositional, structural, and functional studies carried out with different organisms. Even the structure of individual purified complexes was investigated using high resolution electron microscopy. The relation between structure and function on molecular level is involved. Specific mutants were produced for this purpose in some cases. Several articles deal with changes of apparatus during plant development and with some external conditions. Further, several low molecular mass proteins of both photosystems are characterised with respect of their function.

Chapter 11 contains 27 contributions dealing with gene expression and regulation in prokaryotes. Several authors investigated the regulation of D1 polypeptide synthesis. Specific mutants with changed, inactivated or deleted genes were produced for experiments in this field. The expression of certain genes is described to be regulated by light, *e.g.*, in case of thioredoxin and ferredoxin-NADP-oxidoreductase.

Also chapter 12 deals with this subject but in eukaryotes. It consists of 40 articles. It is introduced by explanation of chloroplast control of nuclear expression. Inversely, nuclear control of some chloroplast genes is further described. The article on regulation of transcription in chloroplast development follows. Further, the studies of light dependent and independent transcription control of both nuclear and plastid encoded proteins is involved. On the other hand, LHC 2 apoprotein synthesis is regulated by redox poise.

Chapter 13 is concerned on protein translocation and assembly and consists of 37 articles. It is pointed to import machinery of nuclear encoded proteins into chloroplast as well as protein transport within chloroplast. Moreover, protein assembly from subunits in chloroplast is described. The problem of D1 protein turnover within chloroplast is described in several studies.

The last chapter no.14 is devoted to metabolism of lipids and of tetrapyrroles. It consists of 34 articles. Most of contributions deal with metabolism of chlorophyll. Several authors describe light induction of synthesis of pigments (*e.g.*, chlorophyll and carotenoids), and also of some proteins (*e.g.*, ELIPs, protochlorophyllide oxidoreductase). Nevertheless, also light independent chlorophyll biosynthesis occur in special cases.

Similarly as previous volumes, also this one contains the most recent advances in particular areas of photosynthetic research.

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