

Sundqvist, C., Ryberg, M.(ed.): **Pigment-Protein Complexes in Plastids: Synthesis and Assembly.**
- Academic Press, San Diego - New York - Boston - London - Sydney - Tokyo - Toronto 1993.
520 pp. US \$ 102.00.

Biosynthesis of pigment-protein complexes and their assembly in the chloroplast membrane, which is responsible for these color changes, is the central theme of the new volume of the "Cell Biology" series of monographs. Synthesis of pigment-protein complexes accompanying the formation of thylakoid membrane is a multisynthetic process of numerous pigments, proteins and lipids which proceeds in parallel with highly ordered transport mechanism and a sophisticated membrane insertion apparatus. Well-known specialists in particular areas of this topic summarized the present state of our knowledge in this book. The extensive material presented in this volume is arranged into 15 chapters, each dealing with a particular aspect of chlorophyll-protein complexes formation or function.

The introductory chapter, written by H.I. Virgin, gives a short account of some highlights in the history of research on chloroplasts. This chapter can be useful particularly for the beginning scientists, or for those who are not specialized on photosynthetic research. The second chapter (H. Ryberg, M. Ryberg and C. Sundqvist) deals with plastid ultrastructure and their differentiation and development as revealed by electron microscopy. Special emphasis is placed on conversion of etioplasts to chloroplasts. The effects of light quality and irradiance, and temperature on the regulation of synthesis and assembly of reaction center and of light-harvesting pigment-protein complexes of the chloroplasts are reviewed by K. Eskins in the third chapter. Following three chapters are on chlorophyll biosynthesis. W.R. Richards summarizes published papers treating the dark and light reactions of the biosynthesis of the most important photosynthetic pigment. Introductory pages of this chapter contain a short overview of numerous branches of synthesis of wide variety of tetrapyrroles encountered in nature. Further, a description of individual biosynthetic reactions leading to the formation of the chlorophyll molecule is given. Monovinyl and divinyl pathways of chlorophyll biosynthesis are reviewed as well. Enzymatic apparatus of the two last steps of chlorophyll synthesis, *i.e.* protochlorophyllide photoreduction and chlorophyllide esterification are detailed by R. Schulz and H. Senger, and by W. Rüdiger, respectively, in the next two chapters. Localization and heterogeneity of chloroplasts lipids in plastid membranes and its biosynthesis is the theme of the 7th chapter presented by E. Selstam and A.W. Wigge. Special attention is paid to specific interactions between lipids and pigment-protein complexes in photosystem II and in prolamellar body membranes. Next two chapters summarize recent approaches and results in the analysis of the expression of photosynthetic genes and the synthesis of the encoded proteins (W. Hachtel and A. Friemann), and in import and routing of chloroplast proteins (D. de Boer and P. Weisbeek). Structure, function, assembly and reconstitution of chlorophyll *a/b*-containing proteins (H. Paulsen) and photosystem I proteins (B. Anderson and H.V. Scheller), and structure and organization of photosystem II (H.-E. Ökerlund) are briefly reviewed in three contributions. Remaining three chapters give brief but comprehensive overview of our present knowledge on carotenoids biosynthesis and their distribution among pigment-protein complexes (G. Britton), on development of photosynthetic activities during greening of plant tissues (F. Franck), and on molecular biology of chloroplast development (C.A. Price *et al.*). Unfortunately, this volume does not cover sufficiently such important topics as pigment-protein structure, light capture and transfer of excitation energy to a photochemical reaction centre, and classification and nomenclature of pigment-proteins. The unified form of contributions, broadly approached introductions and some overlap among the chapters facilitate the reading of the book. The text is accompanied by numerous schemas of formation, structure and functions of thylakoid constituents, photos and tables. Some presentations of the most important original results are also included. A good author- and subject indexes are supplemented. Starting scientists and researchers non-specialized in biosynthesis of chlorophyll-proteins will find also well-chosen list of references for further study at the end of each chapter.

This book is recommended for all researchers interested in any area related to the chlorophyll-proteins.

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