

Gräber, P., Milazzo, G. (ed.): **Bioenergetics**. - Birkhäuser Verlag, Basel - Boston - Berlin 1997. 560 pp. Hardcover DM 298.00. ISBN 3-7643-5295-7.

The book represents the fourth volume of the series Bioelectrochemistry: Principles and Practice. It comprises twelve chapters, Introduction and Subject index. The individual chapters are written by different authors with high scientific reputation. The list of authors contains 18 names from different European countries (Germany - 9, The Netherlands - 3, U.K. - 2, France - 1, Italy - 1, Switzerland - 1, Hungary - 1). Each chapter represents an independent part containing List of Contents, References and some also Appendix.

The book offers a very good and up-to-date survey of the most important fields in molecular bioenergetics. The text concentrates mainly on description of molecular mechanisms structure, composition and energetic relations of basic processes. The introducing three chapters are devoted to some more general aspects of bioenergetics. Chapter 1 describes the application of nonequilibrium thermodynamics for description of energy conversion in biological systems. Chapter 2 deals with the global bioenergetics, concentrating on thermodynamics of bioenergetic processes and their relation to the earth energy balance. Chapter 3 is named Vectorial bioenergetics and documents the vectorial character of bioenergetical enzymatic reactions including transport phenomena. In many respects there is a close connection between photosynthetic and respiratory phenomena. This is documented in Chapter 4 dealing with energetics of aerobic and anaerobic bacteria. Molecular and membrane energetics of different types of chemotrophic and phototrophic bacteria is surveyed. In a similar sense the Chapter 9 deals in parallel with cytochrome *b6/f* (photosynthesis) and cytochrome *bc1* (mitochondria) complexes. Photosynthetic systems are presented in chapters 5, 7, 8, 11 and 12. In Chapter 5 named Chloroplast the basic properties of C_3 photosynthetic carbon reduction, C_2 photorespiratory carbon oxidation and C_4 (CAM) photosynthetic carbon assimilation are outlined together with biosynthetic and transport phenomena in chloroplasts. Photoregulation of chloroplast function is shown. Chapter 7 describes in detail photosystem 2 and water oxidation in cyanobacteria, algae and higher plants. Similarly Chapter 8 deals with photosystem 1 reaction center in oxygenic photosynthesis. A special photosynthesis of halobacteria is explained in Chapter 11 named Bacteriorhodopsin. A detailed information on structure, function and regulation of H^+ -ATPases from chloroplasts is given in Chapter 12. Although the antenna systems are not treated in a separate chapter, they are mentioned and described in several chapters of the book. Two chapters are devoted solely to mitochondrial bioenergetics. Chapter 6 deals with mammalian mitochondrial respiratory chain and Chapter 11 describes the important mitochondrial enzyme cytochrome *c* oxidase.

The book is of high didactic and scientific level. It contains among others many model schemes, structures, figures, spectra and tables together with reaction equations. Although it was not possible to give an exhaustive survey of details of all phenomena, a sufficient information on nature of the processes and open questions is given. The basic electrochemical description using free enthalpy G , redox potential and transmembrane difference of electrochemical potential is maintained uniformly throughout the text. However, the results of all important scientific fields engaged in studies of bioenergetics are presented. So, for example, in addition to basic biochemical data the biophysical approach is used in several parts including a characterization of theoretical physical models (e.g. models of electron and excitation transfer in Chapter 7). On the other hand, the results of genetical approaches including site-directed mutagenesis are used.

The book should be of interest for workers in the field of bioenergetics and for those interested in modern biology at molecular and cellular level. It may be recommended as a textbook to university teachers and students for courses in bioenergetics.

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