Ernster, L. (ed.): **Molecular Mechanisms in Bioenergetics**. - Elsevier, Amsterdam - London - New York - Tokyo. 521 pp. Dfl. 160.00, US $ 91.50.

The unique feature of the life is to employ energy in order to increase the organization of matter and to form endless variety of organisms over the Earth. To describe, how they do it, how they convert, transduce and store energy is the aim of this volume on bioenergetics. The energy conversion and transduction in living organisms are accomplished by sequence of linked energy transducing reactions each performed on the specialized complex. This book summarises the latest knowledge on atomic structures, functions, genetics and biogenesis of energy converters/transducers. The reader will find computer graphics models of the atomic structure, arrangement of helixes, amino-acid sequences, genetic maps and principles of operation of energy transducing systems in mitochondria, chloroplasts and bacteria.

The reviewed book is the volume 23 of the well known series titled "The Comprehensive Biochemistry" edited by A. Neuberger and L.L.M. Van Deenen. It contains twenty chapters each written by top specialists in their field. Despite of many contributors, the layout of the text as well as the arrangement of paragraphs in individual chapters are very conforming, thus making the orientation in the text easy. The introductory chapter, wrote by H.V. Westerhoff and K. Van Dam, gives theoretical background on how and why the living systems are able to increase their free energy and to control its transduction. Further chapters deal with individual free energy transducing systems. Formation of the convertible energy currencies *i.e.*, ATP, proton gradient and Na^+ gradient, from external energy sources, and their mutual conversion is discussed by V.P. Skulachev. Light to proton gradient energy conversion by bacteriorhodopsin in purple membranes of halobacteria is reviewed by R. Renthal. Our knowledge on light energy conversion in photosynthetic reaction centres is summarised by J. Diesenhofer and H. Michel (bacterial reaction centres), and by B. Andersson and L.-G. Franzén (reaction centres of photosystems I and II). Following six chapters deal with enzymes of redox reactions: NADH-ubiquinone oxidoreductase (by T.P. Singer and R.R. Ramsay), succinate-ubiquinone oxidoreductase (by L. Hederstedt and T. Ohnishi), mitochondrial ubiquinol-cytochrome *c* oxidoreductase (by G. Bechmann, U. Schulte and H. Weiss), cytochrome *c* oxidase (two chapters by T. Haltia and M Wikström, and by B. Kadenbach and A. Reimann). Recent findings on nicotinamide nucleotide transhydrogenases are summarised by Y. Hatefi and M. Yamaguchi. Two chapters are devoted to ATP synthase. Its structure and assembly are reviewed by G.B. Cox, R.J. Devenish, F. Gibson, S.M. Howitt and P. Nagley. The reaction mechanism is described by R.L. Cross. Following chapters deal with the pyrophosphate metabolism (by M. Baltscheffsky and H. Baltscheffsky), mitochondrial calcium transport (by C. Richter), transmembrane carriers in mitochondria (by R. Krämer and F. Palmieri), thermogenin and heat-producing system (by J. Nedergaard and B. Cannon), hormonal regulation of the energy metabolism (by J.B. Hoek), application of nuclear magnetic resonance in bioenergetics (by G.K. Radda and D.J. Taylor) and mitochondrial biogenesis (by A. Chomyn and G. Attardi).

The text is accompanied by 28 tables and 108 black and white figures. Unfortunately, the figures of atomic structures are printed black and white, so particular atoms or bounds are less distinguishable. Although most of the contributions is not specially devoted to the plant metabolism, energy transducing systems are of general importance and thus they are of interest also for researchers working in various fields of plant research including photosynthesis, ecology and genetics. This volume contains also an historical introduction covering earlier works in bioenergetics, which will be appreciated particularly by teachers and advanced students working in bioenegetics and related fields. The book is available from Elsevier Science Inc. in Amsterdam (P.O. Box 1991, 1000 BZ Amsterdam) and in New York (P.O. Box 945, Madison Square Station, NY 10169-0757).

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