

Møller, I.M., Gardeström, P., Glimelius, K., Glaser, E. (ed.): **Plant Mitochondria: from Gene to Function.** - Backhuys Publishers, Leiden 1998. 603 pp. NLG 296.00. ISBN 90-5782-009-9.

This book represents contributions from the International Congress on Plant Mitochondria: from Gene to Function, held in Aronsborg in Sweden in 22 - 27 June 1998. Although it was the second Congress of experts working in biochemistry, molecular biology and physiology of plant mitochondria, it was actually tenth meeting on mitochondria held by scientists only from particular fields. The presence of all these researchers was the reason of such broad range of contributions: from mitochondrial genomes to mitochondrial enzymes. The book is divided into eight sections.

First part is called Mitochondrial genomes and contains eight articles. There are papers dealing with structure, evolution and organization of mitochondrial genome. The mitochondrial genome varies to a great extent between closely related species. Interesting study is of *rps 2* gene that encodes ribosomal protein S2. It is encoded by mitochondrial DNA in some species while in others is absent here but found in nuclear DNA. Second section with twelve contributions concerns to mitochondrial mutations. Particular mutations lead, *e.g.*, to cytoplasmic male sterility (CMS). This phenomenon can be restored by nuclear genes. CMS was investigated by molecular and population geneticists. Also naturally occurring CMS was studied on molecular level in order to unravel what genes are involved in formation of CMS. Nine articles in the third section are devoted to RNA editing and transport. They cope with unique feature of plant mitochondrial tRNAs because they originated in three different genetic sources: native mitochondrial tRNAs, chloroplasts-like tRNAs and nuclear encoded tRNAs. In addition, the composition of these three groups is strikingly different among plants. These differing patterns could be correlated with the characteristics of

corresponding aminoacyl-tRNA synthetases. Expression of mitochondrial genes covers fourth part, which has eleven contributions. There is concise overview at the beginning that involves the newest advances in this area. The articles are focused on all steps of this complicated event: promoters, splicing, editing, regulation and interaction between mitochondria and nucleus. It was found that mitochondrial gene expression is regulated by a respiratory complex II. Next section concentrated on mitochondrial biogenesis is voluminous and contains 19 papers. Key role play protein import and assembly apparatus because most of polypeptides are synthesized in cytoplasm. The sixth part involves also 19 papers that are pointed to mitochondrial enzymes. Mostly, they describe several metabolic pathways that are specific for plant kingdom as well as those that are general. Twenty one articles in the seventh part concerns processes specific for plants – alternative oxidative pathway that probably acts as a prevention against fluctuation in respiratory electron transport. Alternative oxidase was studied with respect to regulation of its gene expression and activity. This enzyme is involved in plant coping with stress conditions. The last section is aimed at interactions between respiration and photosynthesis. Rapid exchange of metabolites and redox transfer was proved among mitochondria, chloroplasts, and peroxisomes during photorespiration. Ways of communication and exchange between these organelles were studied.

The book enables us to better understand a progress in the vast field studing plant mitochondria. It can be recommended to all range of experts dealing with this topic, *i.e.*, biochemists, molecular biologists, physiologists, and give us suggestions for future research.

N.WILHELMOVÁ (Praha)