***Organelles
in Eukaryotic
Cells
Molecular Structure
and Interactions***

Organelles in Eukaryotic Cells

*Molecular Structure
and Interactions*

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PREFACE

Every year, the Federation of European Biochemical Societies sponsors a series of Advanced Courses designed to acquaint postgraduate students and young postdoctoral fellows with theoretical and practical aspects of topics of current interest in biochemistry, particularly within areas in which significant advances are being made. This volume contains the Proceedings of FEBS Advanced Course No. 88-02 held in Bari, Italy on the topic "Organelles of Eukaryotic Cells: Molecular Structure and Interactions."

It was a deliberate decision of the organizers not to restrict FEBS Advanced Course 88-02 to a discussion of a single organelle or a single aspect but to cover a broad area. One of the objectives of the course was to compare different organelles in order to allow the participants to discern recurrent themes which would illustrate that a basic unity exists in spite of the diversity. A second objective of the course was to acquaint the participants with the latest experimental approaches being used by investigators to study different organelles; this would illustrate that methodologies developed for studying the biogenesis of the structure-function relationships in one organelle can often be applied fruitfully to investigate such aspects in other organelles. A third objective was to impress upon the participants that a study of the interaction between different organelles is intrinsic to understanding their physiological functions.

This volume is divided into five sections. Part I is entitled "Structure and Organization of Intracellular Organelles." The two contributions on mitochondrial respiratory chain complexes and the F_0 - F_1 ATP synthase illustrate the general principles involved in studying structure-function relationships in membrane-bound components of organelles. The third contribution deals with peroxisomes; the essential role of these organelles in mammalian physiology is illustrated graphically by the recent discovery of lethal genetic diseases in man in which peroxisomal functions are impaired.

Membrane flow through the vacuolar system has become a major area of research during the last few years. The two contributions in Part II deal with this subject. In one, vesicular traffic between elements of the vacuolar system is discussed. In the other attention is paid not only to protein transport but also to the equally important question of the movement of lipids during membrane flow.

Part III is devoted to a consideration of the interactions between organelles during metabolism. The specific subjects covered include Control Analysis, intra- and intercellular interactions during ureogenesis and pH homeostasis, and the mechanism of action, both at the cellular and at the molecular level, of a bacterial toxin.

Genetic interactions during the biogenesis of different organelles is

covered by the five contributions in Part IV. The two contributions on mitochondrial biogenesis discuss the organization and evolution of the mitochondrial genome and, on the other hand, the expression of the nuclear genes coding for mitochondrial respiratory chain complexes which, in mammals, clearly is tissue specific.

Finally, Part V is a unique feature of this volume. It is a methodological section, and it contains detailed protocols for studying various aspects of structure-function relationships in complexes of the mitochondrial inner membrane, the biogenesis of mitochondria, the regulation of lipid and nitrogen metabolism in the liver, and membrane functions in chromaffin granules.

J.M. Tager
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