Membrane Transport in Biology

Edited by
G. Giebisch D. C. Tosteson
H. H. Ussing

III

Transport Across Multi-Membrane Systems

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Volume III

Preface

The contributions of this volume are concerned with transport phenomena in multimembrane systems and in simple epithelia. In addition to the very substantial progress that has been made in the area of transport of fluid and solutes across artifical model membranes *in vitro* and across simple symmetrical cell membranes, much has been learned from studies of transport phenomena in multimembrane systems of higher complexity to be reviewed in this volume. It should be recalled that many of the fundamental conceptual and methodological problems of transport physiology have been successfully approached and defined by studying simple epithelia *in vitro,* and that the direction that research has taken has been affected in a major way by the cellular transport models that have evolved from this approach. Since then striking progress has been made in several areas. Not only have we been witnessing a keen and productive interest in the realtionship between fine structure and transport behavior in multimembrane systems but significant advancements have also been made in defining individual active and passive transport operations, in analysing cell ion activities and transport pools, and in describing the differences in transport functions that underly the membrane asymmetry and cell polarization of cells subserving directional transport. What has emerged is a better understanding of the functional organization of directional solute and solvent transport through and between cells, and a firm and rational basis for the even more complex problem of studying transport phenomena on the whole organ level.

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