

Membrane Transport in Biology

Edited by

G. Giebisch D. C. Tosteson

H. H. Ussing

III

Transport Across Multi-Membrane Systems



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Contributors

M.A. Bisson D. Erlij A.L. Finn J. Gutknecht
D.F. Hastings J. Hess Thaysen A. Leaf E.A.C. MacRobbie
S.H.P. Maddrell A. Martínez-Palomo J.L. Oschman
H.H. Ussing E.M. Wright J.A. Zadunaisky K. Zerahn

Editor

G. Giebisch

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Professor Dr. Gerhard Giebisch
Yale University, School of Medicine, Department of Physiology
333 Cedar Street, New Haven, Conn. 06510 / USA

Professor Dr. Daniel C. Tosteson, Dean
Harvard Medical School
25 Shattuck Street, Boston, Mass. 02115 / USA

Professor Dr. Hans H. Ussing
University of Copenhagen, Institute of Biological Chemistry A
13 Universitetsparken, DK-2100 Copenhagen

Dr. Magdalena T. Tosteson
Harvard Medical School, Department of Physiology
25 Shattuck Street, Boston, Mass. 02115/USA

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Edited by

G. Giebisch · D. C. Tosteson · H. H. Ussing

Associate Editor

M. T. Tosteson

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 artificial 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 relationship 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.

New Haven, Boston, Copenhagen

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

List of Contributors

Mary A. Bisson

The University of North Carolina, School of Medicine, Dept. of Medicine,
Chapel Hill, N. C./USA

David Erlij

SUNY Downstate Medical Center, Department of Physiology, Box 31,
450 Clarkson Avenue, Brooklyn, N. Y. 11203 / USA

Arthur L. Finn

The University of North Carolina, School of Medicine, Dept. of Medicine,
Division of Nephrology, Old Clinic Building 226 H,
Chapel Hill, N. C. 27514 / USA

John Gutknecht

Duke University Marine Laboratory, Beaufort, N. C. 28516 / USA

David F. Hastings

Duke University Medical Center, Dept. of Biochemistry, Durham, N. C. / USA

Jørn Hess Thaysen

Rigshospitalet, University Hospital, 9 Blegdamsvej, DK-2100 Copenhagen

Alexander Leaf

Massachusetts General Hospital, Medical Services, Boston, Mass. 02114 / USA

E. MacRobbie

University of Cambridge, Botany School, Downing Street,
Cambridge CB2 3EA / Great Britain

S. H. P. Maddrell

University of Cambridge, Department of Zoology, Downing Street,
Cambridge CB2 3EJ / Great Britain

A. Martínez-Palomo

Centro de Investigacion del IPN, Apartado Postal 14-740,
Mexico 14, D. F. / Mexico

James Oschman

Marine Biological Laboratory, Woods Hole, Mass. 02543 / USA

Hans H. Ussing

University of Copenhagen, Institute of Biological Chemistry A,
13 Universitetsparken, DK-2100 Copenhagen

Ernest M. Wright

University of California, Department of Physiology, School of Medicine,
Los Angeles, Calif. 90024 / USA

Jose A. Zadunaisky

New York University Medical Center, MSB — 451, 550 First Avenue,
New York, N. Y. 10016 / USA

Karl Zerahn

University of Copenhagen, Institute of Biological Chemistry A,
13 Universitetsparken, DK-2100 Copenhagen

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