

# Advances in Comparative and Environmental Physiology 1

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Advances in

# Comparative and Environmental Physiology

1

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## NaCl Transport in Epithelia

Guest Editor: R. Greger

With Contributions by

R. Bakker · G. A. Gerencser · R. Gilles · R. Greger  
J. A. Groot · F. Lang · E. H. Larsen · W. S. Marshall  
L. G. Palmer · A. Péqueux · E. Schlatter · M. J. Welsh

With 70 Figures



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## Foreword to the Series

The aim of the series is to provide comprehensive, integrated reviews giving sound, critical, and provocative summaries of our present knowledge in environmental and comparative physiology, from the molecular to the organismic level.

Living organisms have evolved a widespread range of basic solutions to cope with the different problems, both organismal and environmental, with which they are faced. A clear understanding of these solutions is of course of fundamental interest for all biologists, zoologically or medically oriented. They can be best comprehended in the framework of the environmental and/or comparative approaches. These approaches demand either wide surveys of animal forms or a knowledge of the specific adaptive features of the species considered. This diversity of requirements, both at the conceptual and technological level, together with the fact that physiology and biochemistry have long been mainly devoted to the service of medicine, can account for the fact that these approaches emerged only slowly amongst the other new, more rapidly growing disciplines of the biological sciences.

The field has now gained the international status it deserves and the organization of a series devoted to it appeared timely to me in view of its actual rapid development and of the interest it arouses for a growing number of biologists, physiologists, and biochemists, independently of their basic, major orientation.

Liège, Belgium, Spring 1988

*Raymond Gilles*

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## Preface

After the pioneering studies by Ussing and co-workers, studies of epithelial NaCl transport have come a long way. The first phase of the phenomenological description of the cell as a black box has been followed by studies of cellular mechanisms, the interplay of the different transport components, and the mechanisms of regulation. A broad spectrum of methods has been applied to many epithelia in a variety of species. For the individual epithelia transport schemes have been proposed, and, at this point I think it is appropriate to take a pause and search for elements common to several epithelia. This aspect triggered the publication of this book, and in fact the various chapters emphasize that the functional components, expressed in the various epithelia, are not infinite in number, but they occur in epithelia which are separated in evolution by several hundred million years.

The authors come both from the field of veterinary and human physiology as well as from biology. In my opinion, the close contacts and collaborations between physiologists and biologists have been essential for the progress in this field. I wish to thank all authors for their contributions, and I hope that the reader will appreciate this collection of up to date reviews on epithelia in nonvertebrates and vertebrates.

Freiburg, May 1988

*Rainer Greger*

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