

INTRODUCTION

The sodium pump or Na,K-ATPase was discovered in 1957. In view of the complexity of the system, its mechanism and roles are still not fully understood. The system is often ignored or confused with channels and other transporters. It is also poorly known that the sodium pump is the pharmacological receptor for cardioactive steroids from plants (ouabain, digoxin, convallotoxin, etc.) and from the toad (bufotoxins), and for the powerful palytoxin from the coral *palythoa toxica*.

The current book presents a summary of most aspects of the sodium pump, going from its discovery to the properties of the molecule, its isolation and reconstitution into artificial membranes, to the roles in the cell and in the organism, and to its alteration by environmental stress and disease, including radiation damage, a particular problem during space flight.

The book is designed to be a guide to the status of knowledge on the sodium pump/Na,K-ATPase in the 20th century, giving easy access to all relevant topics and to the corresponding literature. Over 1200 references are cited. The topics are illustrated with simple schemes and drawings, and some aspects are illustrated by original data of the author's laboratory, who had started her PhD work on Na,K-ATPase in 1969 in the Department of Pharmacology, University of Geneva, Switzerland. Each chapter can be singled out and read separately since it contains a full description of the topic. Simple drawings, sketches and schemes facilitate the understanding of complex topics.

Hence, the book presents a "time-saver": complex knowledge on the sodium pump is presented in condensed form in a single volume. However, a single book cannot be exhaustive on such a large topic, and some aspects were not reviewed in detail, in particular the precise structure of the molecular structure and the modulation of the system by hormones; such topics can be read in reviews or in specialized books.

On the other hand, the strength of this book lies in its historical dimension, since virtually the whole pioneering work performed in the 20th century is reviewed, with the advantage, that the author had the occasion to discuss personally about the sodium pump or to perform collaborations with some prominent investigators in the field, i.e. to be able to share firsthand knowledge. Part of the research performed by the author's research group on

the isolation and reconstitution of the sodium pump in artificial membranes (liposomes) is also shown in this book.

In sum, the present book presents a unique occasion to gain rapidly sound knowledge on the sodium pump (Na,K-ATPase), from its discovery to the Nobel Prize of Jens Chistian Skou for his work on Na,K-ATPase in 1997, and two years beyond.

DEDICATION

This work is dedicated to my *alma mater*, the University of Geneva, Switzerland, to all the amazing scientists I have encountered, and to my close family which has always supported my work.