

A proliferation of potassium channels

Potassium Channels: Structure, Classification, Function and Therapeutic Potential

edited by Nigel S. Cook, Ellis Horwood, 1990. £59.95 (412 pages) ISBN 0 7458 0624 4

The increased interest in K⁺ channels that has occurred in recent years has resulted from a number of factors. Patch-clamp recording techniques have revealed the widespread occurrence of K⁺ channels and led to the discovery of new varieties. Potent blockers such as charybdotoxin, apamin, and sulphonylureas, which are selective for one or a few channel types, have been discovered. Molecular biology is beginning to reveal the structural relationships between different K⁺ channels. Together, these have led to growing understanding of the roles of these channels, of the ways in which they are modulated by transmitters, and of their potential as targets for drugs. For example, the identification of the ATP-sensitive K⁺ channel in pancreatic β-cells was followed rapidly by the realization that block of this channel underlies the therapeutic action of antidiabetic sulphonylureas.

This book attempts to bring together many of these recent developments, as well as more general background information, in a series of reviews. It is divided into two sections. The first, and more cohesive, is essentially channel based, covering the properties of different types of K⁺ channel, as well as channel modulation and molecular structure. The longest chapter in this section is on K⁺ channel pharmacology, reflecting the main focus of the book. This chapter provides an extremely thorough review of both blockers and openers of K⁺ channels. There are good descriptions of voltage-dependent, Ca²⁺-activated and ATP-sensitive channels, while the chapter on modulatory mechanisms by Pfaffinger and Siegelbaum covers a complex subject with admirable clarity. As is common in such multi-author works, however, there are discrepancies in the level of detail in different chapters. It seems odd that a separate chapter is devoted

to Na⁺-activated K⁺ channels, describing just six original papers on these channels, while Ca²⁺-activated channels are dealt with in only twice the space, and A-currents (I_A) are covered together with delayed and inward rectifiers.

The second section of the book is concerned with the functions of K⁺ channels and with their potential for pharmacological intervention, and is mainly organized by tissue. Again there is some unevenness in coverage. Smooth muscle receives both a chapter on the role of K⁺ channels in tone and another on K⁺ channel openers, while a vast body of work on neuronal K⁺ channels is crammed into one heroic chapter by J. V. Halliwell. The chapter on insulin secretion is excellent, but inevitably there is some overlap with the earlier chapter on K_{ATP} [I_{K(ATP)}]

channels which also concentrates on insulin-secreting cells.

These complaints, however, are minor and should not detract from the overall picture of the book as a valuable reference source for those interested in K⁺ channels, and especially in their pharmacology. The bringing together of this information represents a considerable achievement, and the book is very up to date, especially considering the rapid growth of information in many of the areas covered. It will prove useful to many people working on K⁺ channels, and should also highlight the potential of these channels as targets for a wide variety of therapeutic agents in the future.

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Free radical pathophysiology

Oxygen Radicals: Systemic Events and Disease Processes

edited by Dipak K. Das and Walter B. Essman, Karger, 1990. DM 208.00/£72.50/\$116.00 (xii + 196 pages) ISBN 3 8055 5049 9

This is a concise and authoritative monograph which surveys free radical processes and their effects in biological systems; the topics are linked by the theme of oxygen-radical-induced tissue injury. Thus pathology in various different biological systems forms the mainstay of the book. Although wide ranging, a major problem is that the references for the most part do not extend beyond 1987.

This is particularly important in the chapter by Dipak K. Das and Richard M. Engelman which is a detailed discussion of mechanisms of free radical generation during reperfusion of the ischemic myocardium. This is an important topic and the review is timely, as the use of thrombolytic therapy and coronary artery angioplasty has generated interest in the physiological events associated with myocardial reperfusion. The chapter provides a survey of the multiple sources of free radicals (particularly polymorphonuclear leukocytes and xanthine oxidase), and the mechanism of

tissue injury in the ischemic/reperfused heart, and addresses the question of the mechanism by which allopurinol and oxipurinol salvage myocardial function: aside from their ability to inhibit xanthine oxidase, there is evidence that these drugs have direct scavenging potential. There is an important, albeit too brief, discussion of methods used to detect and identify activated oxygen species. The outdated reference list is very disappointing as this is a topic where much has been accomplished within the last few years.

This book is easy to read and should serve as an excellent introduction for students entering the field of free radical biology as it pertains to pathophysiology. For those already engaged in the area of free radical research, it is a refreshing review, and the numerous literature citations, despite their age, should prove useful, although the experienced investigator may be all too familiar with the subject matter. The illustrations, while not numerous, are clear and carefully prepared. The overall format is excellent and consistent throughout. Although its cost is a major deterrent for the individual purchaser, the book should be a part of an institution's library.

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