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Book Review

'The Axon – Structure, function and Pathophysiology'

Ed. S.G. Waxman, J.D. Kocsis and P.K. Stys

Oxford Medical Publications, England, 1995. 708 pp. £145.00 ISBN 0-19-508293-1

This beautifully presented volume is introduced by a historically stunning account of electrical activity of nerve and the background up to 1952 by Sir Andrew Huxley. The text is then divided into further sections, an account of the 'Normal Axon' and 'Principles of Axonal Pathophysiology'. The initial section is definitive and of inestimable value to researchers within the field. The morphology of peripheral and central nervous system axons their pathophysiology, the morphology and function of Schwann cells and oligodendrocytes the biology of myelination the relationships between axons glial cells concepts of axonal development and transport. The role of Voltage-gated channels and their molecular biology. Mechanisms of axonal excitability the significance of ion pumps and exchanges and electrophysiological approaches towards the study of axonal function are elegantly covered by a litany of recognised authorities in each individual field.

In the third section 'Mechanisms and principles of Axonal Pathophysiology are dealt with in detail. Of particular interest here are the sections on 'Pathology of the myelin sheath' the consequences of Anoxic/ischemic injury and trauma' and the processes of regeneration. Kimura's section on 'Clinical electrophysiology of the peripheral nervous system' is of particular merit as is that of Ian McDonald in his invaluable overview of 'Clinical aspects of multiple sclerosis' including cognitive deficit.

In essence this book is highly recommended. It is of particular value to those involved in basic clinical neuroscience and is unlikely to benefit under-graduates or trainees in neuroscience disciplines unless the latter had embarked upon a course of specific interest and research. The book is beautifully laid out and illustrated. In particular the section on 'molecular biology of myelination' where the illustrations helped the reader come to grips with basic scientific concepts. I suspect that this text will act as a definitive source for a while to come.

I believe readers of this book will largely come from non-clinical neuroscience. However, it is of value to clinicians with a specific interest in axonal function both within the central and peripheral nervous system. The book is costly, but this perhaps reflects the high quality of its presentation as well as the rather limited market to which it is aimed. In conclusion, the editors are to be congratulated on producing a text of enormous value and hopefully one which will continue to be updated in the years ahead.

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Molecular and Genetic Basis of Neurological Disease

Edited by Roger N Rosenberg, Stanley B Prusiner, Salvatore Dimauro and RL Barchi

Heineman Publishing, Oxford, January 1997. 2nd Edition, 1312 pp. £148.75. ISBN 0 7506 9668 0.

Molecular genetics and molecular biology are the most rapidly advancing areas of the neurosciences. A multitude of single gene disorders have been identified at the molecular level. This has had an important impact, not only on defining aetiology but also on our understanding of the phenotypic variation that can ensue from single mutations, raising the spectre of genetic or environmental modifying factors. In some cases, clinical classifications have had to be re-evaluated in the light of the underlying molecular genetic cause.

Articles defining the molecular genetic basis of neurological diseases appear at high frequency, although one anticipates that when attention turns to polygenic disorders, advances will be less rapid. Given the volume of such information and the speed with which it appears, how can a text hope to be relevant and up to date? Obviously, modern publication methods help but editorial coercion and author cooperation in meeting deadlines are probably more important! In their preface, the editors indicate that most of the scientific material in this second addition was not present even five years previously, and this is reflected in the information contained in the various chapters and their accompanying references.

This book is a compendium of genetically based neurological disease. Inevitably neuromuscular diseases figure prominently but there are also extensive sections on lysosomal disorders and degenerative conditions in addition to briefer sections on a wide variety of subjects from the phakomatoses to disorders of metal metabolism. Inevitably some chapters are more up to date than others and some sections perhaps represent the authors' emphasis on a topic. Nevertheless, the content is truly comprehensive and this book should prove an invaluable reference for those within the field of molecular neurosciences and for those who seek to understand the molecular genetic contribution to a particular disorder. Inevitably the book is primarily directed to those with some expertise in the field but should encompass both clinicians and scientists.

The book is clearly laid out and its division into 23 sections is a reflection of its wide scope. The early sections are valuable in providing some background information on linkage analysis and gene targeting as well as providing a neurological gene map, although inevitably even this is now a little out of date. The text and figures are standard but many chapters are complemented by good standard clinical photographs and there are some colour plates in the book. Information is easily accessed through a good index. Its production in a single volume is helpful as inevitably this text will be used as a reference and two handier sized volumes would not have improved convenience and no doubt would have added to the price which at £148.75 is not inconsiderable.

Where can one find fault with this book? This was not easy but I would have to suggest that the section on neurodegenerative diseases could have been more detailed. There have been many recent advances in defining biochemical and genetic abnormalities in, for instance, Alzheimer's disease, Parkinson's disease and amyotrophic lateral sclerosis. Although these are contained within the text, more in-depth analysis might have been useful.

In conclusion, I think that this book is a triumph of editorial skill. The final product is an excellent and comprehensive product which should prove invaluable to those of us with an interest in this area. No one can possibly keep up with all of the myriad of mutations now being identified in the diseases which come under our speciality. This book provides an invaluable reference. I anticipate that the third edition will have its emphasis on protein product and pathogenesis rather than molecular genetics and aetiology.

This book is dedicated to Anita Harding and I am sure she would be proud to be associated with it.

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