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Protein Targeting and Translocation

Barry D. Bruce
University of Tennessee, Knoxville, bbruce@utk.edu

D.A. Phoenix
Editor

function positively and negatively in the events of initiation, elongation, and termination of gene transcription. Part II is an interpretation of disease processes based on mutations or alterations in transcription factor activity. The basic science section provides an excellent fundamental description of gene expression and transcriptional regulation. The areas of *Cis*-acting transcriptional regulatory elements (DNA sequences within a gene regulating its transcription) and *Trans*-acting factors (proteins that interact with the DNA and other proteins) are extensively covered. There are a few minor weaknesses: we found the illustrations somewhat disappointing, and full color or more detailed graphics would have been helpful, especially when demonstrating clinical findings. Furthermore, there was no mention of transcription factors as morphogens. This theory posits that transcription factors that regulate development in multicellular organisms are expressed as a gradient in the developing embryo, and provides an explanation as to how polarity is established (e.g., the dorsal/ventral axis). This omission is significant in that many of the diseases discussed later in the book are a consequence of abnormal morphogenesis. Finally, the role of transcription factors in human diseases focuses primarily on germ line mutations, and there is little or no discussion of the role that overexpression of these factors or somatic mutations play in human diseases. For example, additional information on the role of somatic mutations in neoplastic diseases would have been useful, but was instead summarized briefly in one chapter. Also, activation of transcription factors like AP-1 have been implicated in many inflammatory diseases involving matrix destruction and remodeling. Although the title of the book suggests that these areas will be discussed, there is little or no mention of them. Despite these criticisms, we found this book to be a wealth of information, and would recommend it to neophytes as well as experienced researchers in the field.

EDWARD SCHWARZ, *Allergy, Immunology & Rheumatology, School of Medicine, University of Rochester, Rochester, New York* and GARY S FIRESTEIN, *Rheumatology, Allergy & Immunology, School of Medicine, University of California, San Diego, La Jolla, California*

FREE RADICALS AND IRON: CHEMISTRY, BIOLOGY, AND MEDICINE.

By M C R Symons and J M C Gutteridge. Oxford Science Publications. Oxford and New York: Oxford University Press. $115.00. xii + 242 p + 2 pl; ill.; index. ISBN: 0-19-855892-9. 1998.

The topic of oxidative stress is becoming central to our understanding of many disease processes including cancer, coronary heart disease, and Parkinson's and Alzheimer's diseases. Therefore, it is important that all researchers in biology and medicine should be up to date in their knowledge of the topic. This short book is the result of a collaboration between an organic chemist and a biochemist, and deals with one aspect of this large field (i.e., the role of iron and free radical reactions). The first part describes the basic chemistry of free radicals, in particular those derived from molecular oxygen. Then, the basic chemistry of iron in these reactions is discussed. The second part of the book covers the biology of these reactions with particular attention to the role of iron. Topics covered include iron siderophores, iron-porphyrin systems, transferrin, ferritin and lactoferrin, iron-sulfur clusters, and low molecular weight iron complexes. Chapter 7 deals with the enzymatic antioxidant defenses of the organism, and Chapter 8 with the important roles of these systems in normal physiology including signaling. A useful chapter is devoted to an overview of the role of iron in human diseases including iron overload, cancer, heart disease, diabetes, and several neurodegenerative diseases. The last chapter covers the measurement of free radical damage to DNA, protein, and lipids. There are also five appendixes on technical subjects.

The book succeeds very well in its purpose of providing biologists with a concise, interesting, and clear account of this important subject. My only criticism is that the first part may be too technical for the average physician, who would have been helped by some explanation of basic terms in quantum chemistry.

JOHN SMYTHIES, *Psychology, University of California, San Diego, La Jolla, California*

PROTEIN TARGETING AND TRANSLOCATION.

Edited by D A Phoenix. Princeton (New Jersey): Princeton University Press. $85.00. xii + 292 p; ill.; subject index. ISBN: 0-691-00901-5. 1998.

As progress in current biological research moves away from the acquisition of sequences and genomic information, we inevitably return to mechanistic and process-driven investigations (collectively termed functional genomics) with an increased appreciation for membrane-mediated processes. With more than 20 genomes completely sequenced, it is now clear that a substantial amount (as high of 40% in some organisms) of a given genome will encode membrane proteins. This finding is not surprising for eukaryotes, where approximately 95% of cellular membranes function as a defining barrier between a multitude of distinct intracellular structures and organelles. As evolutionary complexity mandates increased cellular compartmentalization, likewise an elaborate system of targeting and translocation machines is required to insure the intracellular movement of macromolecules with high fidelity.

Protein Targeting and Translocation provides a timely and succinct review of how some of these

translocation machines may function. The book is separated into 3 sections, with 16 chapters written by leading authorities on membrane interactions, prokaryotic targeting systems, and eukaryotic targeting systems. In general, the chapters are brief, well written, and sufficiently introduce each topic. In total, the book offers over 1,800 useful references for readers, but unfortunately none are later than 1997. Also, considering the prevailing use of models in the field, the limited number of illustrations in the book is surprising. Although most of the well-studied systems are addressed, one notable omission is the chloroplast import system. In contrast, however, there are a few chapters on less common topics, such as the targeting and assembly of bacterial fimbriae, targeting and trafficking of outer membrane proteins in *E. coli*, and protein targeting in plant glyoxysomes. One particular strength of the book are the very informative chapters that collectively deal with the biochemistry and biophysics of membrane interactions. There are some unfortunate redundancies; for example, four separate chapters discussed the insertion mechanism of secA/G in bacterial secretion. Overall, this well-written volume provides an introduction to many areas of protein transport. The chapters are certainly not comprehensive, but function well to interest and inform readers and as such, will promote the field at large.

BARRY D BRUCE, *Biochemistry, Cellular & Molecular Biology, University of Tennessee, Knoxville, Tennessee*

MOLECULAR ORBITAL CALCULATIONS FOR AMINO ACIDS AND PEPTIDES.

By Anne-Marie Sapse. Boston (Massachusetts): Birkhäuser. $99.00. xii + 178 p; ill.; index. ISBN: 0-8176-3893-8. 2000.

PEPTIDYL-PROLYL *CIS/TRANS* ISOMERASES. *Protein Profile.*

By Andrzej Galat and Sylvie Rivière. Oxford and New York: Oxford University Press. $45.00 (paper). xii + 117 p; ill.; no index. ISBN: 0-19-850288-5. 1998.

This book is part of a series that aims to provide a "practical, comprehensive and accessible source" of information following the "recognition that individuals find it increasingly difficult to access readily the enormous amount of information accumulated by the international research community." At 117 pages (including appendixes) and 926 references, this book certainly sets out to bring together in an accessible format a large body of information, and succeeds in meeting that goal. The book is separated into sections including introduction, sequence analysis of PPIases, their genes and cellular localization, proteins interacting with PPIases, intracellular signaling pathways, ligand binding, structural analysis, biology, methods, bibliography, and five appendixes. The chapters on the sequences of PPIases and their associated proteins are supported by protein databases supplied by the publishers. The text is bolstered with numerous figures and tables.

Much of the book is clearly written for anyone with a good background in this area of biochemistry, and although the information is very densely packed, the style is generally clear and concise. The introduction is by far the weakest chapter in the book, seemingly attempting to appeal to a wider audience. The specialist is left pondering several oversimplifications that border on inaccuracies. The primary problem with such books lies in the rapid advance of our understanding of protein structure and function. Printed in 1998, the most recent references cited are from early 1997. From 1998, the science citation index lists 511 papers that were published with PPI in the title, keywords, or abstract. A rapid increase means that books such as this are invariably out of date by the time they are published. Overall, this is an excellent source for anyone new to this aspect of protein folding, and who wants a synopsis of the field.

LLOYD RUDDOCK, *Biosciences, University of Kent, Canterbury, United Kingdom*

GENOME ANALYSIS: A LABORATORY MANUAL. *Volume 1: Analyzing DNA.*

Volume Editors: Bruce Birren, Eric D Green, Sue Klapholz, Richard M Myers, and Jane Roskams. Plainview (New York): Cold Spring Harbor Laboratory Press. $225.00 (hardcover); $135.00 (comb binding). xxvii + 675 p; ill.; index. ISBN: 0-87969-495-5 (hc); 0-87969-496-3 (cb). 1997.

GENOME ANALYSIS: A LABORATORY MANUAL. *Volume 2: Detecting Genes.*

Volume Editors: Bruce Birren, Eric D Green, Sue Klapholz, Richard M Myers, and Jane Roskams. Plainview (New York): Cold Spring Harbor Laboratory Press. $225.00 (hardcover); $135.00 (comb binding). xxix + 463 p; ill.; index. ISBN: 0-87969-510-2 (hc); 0-87969-511-0 (cb). 1998.

GENOME ANALYSIS: A LABORATORY MANUAL. *Volume 3: Cloning Systems.*

Volume Editors: Bruce Birren, Eric D Green, Sue Klapholz, Richard M Myers, Harold Riethman, and Jane Roskams. Plainview (New York): Cold Spring Harbor Laboratory Press. $225.00 (hardcover); $135.00 (comb binding). xxxii + 648 p; ill.; index. ISBN: 0-87969-512-9 (hc); 0-87969-513-7 (cb). 1999.