The fact that structural aspects are not addressed with the same lucidity as the physiological and physicochemical aspects of membrane transport and bioelectricity represents a limitation of the present edition. Only a scant description of the structure of ion channels, but not of ion pumps, is given, despite the striking advances made recently in this field using the tools of molecular biology. Nevertheless, these drawbacks do not seriously detract from the overall high quality of the book.

In conclusion, I highly recommend this second edition as a valuable introductory textbook or as a reference book for non-specialists in the field.

Cecilia Hidalgo

Cell Adhesion. Fundamentals and Biotechnological Applications; Edited by M.A. Hjortso and J.W. Roos. Marcel Dekker, Inc. New York, 1994. xi + 273 pp. $ 135.00. ISBN 0 8247 8945 8.

The adhesion of cells to each other and to their substratum is an important biological phenomenon that regulates their survival, proliferation, and metabolic activity. Cell adhesion is thus also a major consideration in numerous biotechnological processes, ranging from the production of pharmaceuticals in bioreactors to the sedimentation of bacteria during wastewater treatment. This book, volume 20 in the Bioprocess Technology Series, is intended for students and researchers in biochemical and biomedical engineering and strives to be a comprehensive reference for cell adhesion in a wide variety of biotechnology applications. The first few chapters of *Cell Adhesion* describe the kinetics of ligand–receptor interactions and mathematical models of cell adhesion phenomenon relevant to bioreactor design. Chapter 3 attempts to be provide a broad overview of adhesion in animal cell culture; however, a section on extracellular matrix proteins and their cell surface receptors is incomplete and out-of-date. Other chapters cover the immobilization of cultured plant cells, the application of cell aggregation and sedimentation in various biotechnological systems, the role of biofilm accumulation on solid substrata, and the preparation of inorganic and synthetic organic matrices for cell attachment. With only 288 pages (and at $ 135) *Cell Adhesion* may be too brief to serve as a single-source reference for such a wide range of topics. Researchers in the field of cell adhesion may find it more useful to consult more detailed and up-to-date references on specific areas of cell adhesion.

Marian E. Durkin and Ulla M. Wewer

RNA Isolation and Analysis; Edited by P. Jones, J. Qiu and D. Rickwood, BIOS Scientific Publishers Ltd; Oxford. xi + 196 pp. $ 35.00. ISBN 1 872748 37 6.

The importance of RNA in the origin of life and in numerous aspects of cellular gene expression, have turned RNA into a fashion molecule, investigated in an increasing number of laboratories. This book will provide a starting point for studying the RNA world. The first chapter provides a basic introduction to the structure, processing and function of RNA with an emphasis on eukaryotic mRNAs. The subsequent chapters describe a broad range of basic methodologies essential for handling of RNA in an experiment: isolation, quantitation, size and sequence characterization, and functional analysis. The final chapter gives a brief introduction to isolation of ribonucleoproteins (RNPs) such as ribosomes, polysomes, spliceosomes and heterogeneous nuclear RNPs (hnRNPs). Detailed and clearly written protocols are included for each method together with relevant background information, allowing the inexperienced scientist to evaluate critical parameters. Several alternative approaches are included, and advantages and drawbacks for particular applications are discussed. The book may be used, not only as a protocol, but also as a textbook for understanding the behaviour of RNA within the cell as well as in the test tube. The authors cover most of the basic techniques performed in an RNA laboratory, but powerful methods, such as RNA footprinting, ligation of RNA transcripts by bridging DNA oligo, SELEX, NMR and X-ray crystallography, have not been included in the book. I also miss a more elaborate section on UV-cross linking of RNA to RNA and protein to RNA, in particular when using modified nucleotides to enhance the yield of cross links. The book is aimed toward students and researchers new in the RNA field, but more experienced researchers may also seek help from the book to update or optimize existing lab protocols.

Jørgen Kjems

Antimicrobial Peptides. Ciba Foundation Symposium 186. Edited by J. Marsh and J.A. Goode, Wiley & Sons, Chichester, 1994. viii + 283 pp. $ 76.00. ISBN 0 471 95025 4.

The Symposium on Antimicrobial Peptides held in London in January 1994 was the first focused entirely on gene-encoded antimicrobial peptides, as aptly pointed out by the chairman Hans G. Boman in the opening remarks of this volume. The meeting brought together distinguished scientists whose investigations have led us to appreciate the rich variety of peptides utilized by animals and plants to kill microbes. When reading this volume, one will especially enjoy the contribution of these leading experts to the discussions that follow each paper, which include informal reports of unpublished experiments and colourful anecdotes. In fact, these lively discussions and the extra information they bring out are probably the most enjoyable part of the proceedings, having provided the participants with an opportunity to share their views in such areas as structure, function and biology of antimicrobial peptides.

Although the emphasis is on animal antimicrobial peptides, considered to be the primary defense agents of innate immunity, peptides produced by plants and microorganisms are also discussed. Larger animal antimicrobial proteins such as BPI and serprocidins are considered in separate chapters, as notable exceptions to what seems to be a 'peptide rule' for this effector mechanism of innate immunity. This volume thus provides a useful and up-to-date overview adequately covering the field.

The reader is introduced to the world of antimicrobial peptides through a brief historical account, tracing its roots to early investigations aimed at the identification of agents with a selective toxicity. Some of these studies led to the discovery of the microbial forerunners of the animal antimicrobial peptides. Among the microbial antibiotics, a distinction is made between those which are produced

ıugh a complex enzymatic synthesis, and those which are derived
n precursors made on ribosomes from RNA templates. The latter
gory is regarded as the microbial counterpart of the animal
microbial peptides, and is described by Hans-Georg Sahl in one of
first chapters of this book, allowing for the comparative analysis
nicrobial and animal peptide antibiotics. There follow chapters
st of whom are quite good) devoted to antimicrobial peptides
ıted from various animal organisms, from arthropodes to
nmals, and with such different anatomical origin as haemolymph,
:osal epithelia, or phagocytic cells. A relatively young, but well
ınced field of research is that of plant-derived antimicrobial
:ides, covered in one valuable chapter by Bruno P.A. Cammue.
may come as a surprise to the reader that antimicrobial peptides
ent such a remarkable molecular diversity: 50 to 100 different
microbial peptides identified in the chairman's estimate, tentatively
ıped into five broad classes. It emerges from the discussion
›wing the chapter by Charles L. Bevins, that the rate of evolution
ıese molecules is surprisingly high, especially when considering that
ıy derive from precursors with highly conserved preproregions.
hroughout the volume, these peptides are generally discussed with
:ence to structure, spectrum of activity and mechanism of action.
;ynthesis and gene organization, when known, are also described,
important questions such as mechanisms of gene regulation,
eting and processing pathways, or evolutionary relatedness are
ressed (see in particular Dan Hultmark, Tomas Ganz and Charles
Bevins chapters and related discussions), giving the whole a
tifaceted appeal which will certainly also be appreciated by people
are not involved in this field.
s one might expect, a high consideration has been given to the
echnological potential of these peptides, for their commercial
oitability. Some promising results with gene transfer of plant-derived antimicrobial peptides, reported by Cammue, are viewed in the light of their possible use as transferable resistance traits for genetic engineering of crop plants. A considerable effort has been put into the development of antimicrobial peptides as human therapeutic agents. R.B. Merrifield, in the first chapter of the book, highlights the role of synthetic peptide chemistry in the design of alternative antibiotic agents capable of overcoming the spread of bacterial resistance to the classical antibiotics, and a fascinating chapter by Michael Zasloff puts the potential therapeutic applications of these peptides into sharp focus. One magainin analogue, MSI-78, is already in an advanced phase of clinical trial, and appears to be a good candidate as a topical antibiotic, whereas other clinical applications are suggested by the ability of magainins and magainin analogues to selectively lyse tumour cells in cancer-bearing animals. Of course, 'the challenge facing drug development is to translate the interesting and provocative effects seen on local administration to a systematically delivered agent' in Zasloff's words. This may be one major goal for the near future.

Hans Boman efficiently sums up the state of progress of this field in the closing remarks, highlighting the importance of these peptides in host defense. Much work still needs to be done, but the future of these peptides is looked at with great interest and optimism. Given the increasing popularity of this rapidly evolving field, the symposium was really a timely event, living up to the high standards we have come to expect from the CIBA Foundation Symposia. This volume provides a much needed addition to the scientific literature in this area. It is essential reading for all those approaching this field for the first time, and opens a valuable rear door to the symposium for those who work in the area and regret having missed the chance to attend.

Margherita Zanneti