

Free Radicals: Enzymology, Signalling and Disease

Biochemical Society Symposium 71

C. Cooper, M. Wilson, V. Darley-Usmar (eds). Colchester: Portland Press, 2004: pp 217. ISBN 1-85578-161-1. £65.

This book continues the Biochemical Society Symposium series and is a collection of papers that emanate from a meeting on this topic, held at the University of Essex in July 2003. As the title suggests, the role of free radicals has been divided into three areas (enzymology, signalling and disease), although there is obvious overlap here, but there are several chapters devoted to each. There are 16 chapters in total.

The role of free radicals and their derivatives in biological systems is one of general interest and of importance for future research. Here, the reference to free radicals is a little misleading as there are non-radical derivatives of the free radicals that are really important, the most well characterised being hydrogen peroxide, derived usually from the superoxide radical.

Certainly, over the last 10 years, the production and role of these reactive species, commonly referred to as reactive oxygen species (ROS) and reactive nitrogen species (RNS), have been found to be widespread in biology and of great importance. It is now apparent that such reactive chemicals have dedicated mechanisms for their production, and have profound effects on cells, from the control of enzymes and of gene expression, and the life and death of cells, their roles in cell suicide being a case in point. The way in which these reactive species exert their effect has yet to be determined, but enzymes such as phosphatases are inhibited and the redox status of the cell is influenced.

Thus, this book is on a 'hot' topic and one that is of interest to the biomedical scientist. It begins with chapters on enzymology, followed by works on the role of free radicals in signalling, and concludes with chapters on disease. Signalling is one of the most important areas of modern biochemistry, and the work to elucidate the use of free radicals and their derivatives as signals is growing enormously, while dysfunction of such signalling, along with other disruptive powers of radicals has potential to cause disease, hence the final chapters of this book.

Overall, the chapters reflect the interests of the authors, themselves researchers in the field, and therefore the subjects covered are specific to those research areas. In the Preface, the authors do comment that "one book cannot hope to cover the wide variety of reactions... by giving a flavour..." and thus have not attempted to provide broad coverage of the area, but a rather more detailed and specific treatise on free radical research.

Overall, it is well written, referenced and illustrated, although the work of others is not always cited. The start is somewhat daunting, however, as the chapters are not easily accessible to the non-specialist, but some later chapters are excellent and very readable.

The book purports to address the role of radicals in biology as a whole, but most of the research discussed here is mammalian – ideal for biomedical scientists – but it would have strengthened the text to have included more from other systems. For example, RNS and ROS are now known

to be instrumental in the control of many systems in plants, and the molecular mechanisms underlying these actions will, at least in principle, be the same across the kingdom divide. Some chapters include non-mammalian work (e.g., insects in chapters 6 and 13, and plants, insects, yeast, etc. in chapter 7) but the balance is a little too mammalian orientated. Perhaps this simply reflects the mass of research in this area, and the interests of the potential readership.

Overall, this book is a useful text that gives the reader an up-to-date idea of the thoughts of many of the researchers in the field, which is the point of this type of work. However, it is not the type of book that many would wish to rush out and buy. It does have some very useful chapters, which discuss ageing, prions, etc., but much of it is too detailed for the non-specialist.

The book covers three important and overlapping areas of research, namely enzymology, signalling and disease. To be more accessible to the reader, however, it would have been better divided into three, with a general overview on the current state of research in each area, followed by the more specialist chapters. The detailed work then would have had a better framework, and how these pieces fit into the overall jigsaw would have been clearer. □

J. T. Hancock

Transfusion Science Educational CD-ROM

London and South East Transfusion Training Committee, 2004. Available from: Mr. Steve Owen, Blood Transfusion Department, The Royal Brompton Hospital, Sydney Street, London. £5 (incl. postage and packing; UK only).

In the late 1990s a group of lead biomedical scientists in hospital blood transfusion departments within the London and South East became increasingly concerned about the training and education of junior staff in blood transfusion. With the advent of degree entry to the profession, there was a feeling that although those entering the service were well educated in general science, they lacked the specific knowledge of transfusion science.

As a result, user and advisor groups from the Cambridge, Brentwood, Colindale and Tooting areas combined to form a Transfusion Training Committee (TTC), consisting of at least two elected representatives from the four technical advisor/user groups, together with representatives from the National Blood Service and UK NEQAS BTLF, that produced this CD-ROM of PowerPoint lectures as a useful training tool.

Four years in the making, it is designed to be used either by trainee staff for self-study or as a lecturing aid by senior members of staff. It comprises 28 separate lectures, many with Word documents to be used in conjunction with the PowerPoint lectures to provide fuller explanations where needed. All the classical blood group systems are discussed, together with others such as Kell, Duffy and Kidd. Among the useful general topics covered are 'Antibody Screening', 'FMH Estimation', 'Pre-Transfusion Testing', and 'Component Preparation'. Additionally, a highly informative and topical lecture covers 'Prions', which looks at all aspects of variant Creutzfeldt-Jakob disease and its associated problems.

Each lecture delves deep into the subject matter to cover all essential areas. For instance, the lecture on 'Automation' (29 slides) includes a brief history of the science, then discusses important areas such as system security, product

liability, error reduction and future developments, before reviewing all current major autoanalysers available.

A useful feature throughout the CD is that certain slides considered to be essential knowledge are marked with red asterisks, as is the 'cut and paste' design which enables individual slides to be incorporated into customised lectures.

This series of lectures is a comprehensive and valuable learning tool that would be a useful addition for any transfusion department's training regime, and further editions promise to cover additional lectures on items such as 'transfusion reactions' and 'the red cell membrane'.

One point the authors are keen to point out is that the lectures on the CD-ROM should be used as an adjunct to other educational and teaching material, and not seen as a replacement. □

B. Hill

Collins and Lyne's Microbiological Methods

C. H. Collins, P. Lyne, J. Grange, J. Falkinham (eds). London: Hodder Arnold (8th Edn), 2003: pp 480. ISBN 0340808969 (paperback). £45.

This book was first published over 40 years ago. Now in its eighth edition, it aims to provide a thorough and updated overview of methods in microbiology. The text is well written in a logical format and is presented well in a monochrome style. Figures and tables, mostly the latter, are provided for additional information and references are supplied where required.

As well as providing an introduction to areas such as health and safety, quality assurance and sterilisation methods, the book covers the methods required for handling and identifying all the common groups of bacteria. I do feel, however, that certain sections of the book fall short of their promise and, in some cases, are factually incorrect. For example, the chapter on automated methods does not cover the breadth of automation now available in microbiology and only three pages are devoted to molecular biology, while the chapter on identification methods does not include newer typing methods such as multilocus sequence typing (MLST), which was first described in 1998 and is now widely adopted in reference laboratories for typing some major bacterial pathogens.

Moreover, it states that gels used for pulsed-field gel electrophoresis (PFGE) and restriction fragment length polymorphism (RFLP) analysis can be scanned and made available to clinicians in a hospital a distant location. While this does not happen in practice, it is also incorrect in that such methods are often not reproducible. It is now widely accepted that nucleotide sequence-based methods provide better methodology for comparisons to be made worldwide as the data generated are truly digital.

Another major shortfall of the text is that, in many chapters, the references are out of date. It also over cites chapters from various editions of Topley and Wilson. While I am a big believer in retaining references of historical importance, updated references should be supplied where possible.

This said, the book will prove very useful as a standard text for undergraduates worldwide and will be used commonly, as the authors state, as a bench book. □

S. C. Clarke

Modern Medical Microbiology: The Fundamentals

Stuart C. Clarke. London: Arnold, 2004: pp 239. ISBN 0-340-81044-0. £19.99.

Regular readers of *The Biomedical Scientist* will need no introduction to the name of Dr Stuart Clarke, as he has authored an extended series of articles covering a range of microbiological topics. Once upon a time I kept all my copies of *The Biomedical Scientist* but limited space has now changed the habit of a lifetime. Thus, it was a great pleasure to discover that Clarke's review articles from *The Biomedical Scientist* have been collated into a single volume.

The articles are not grouped in chronological order of original publication but into five sections. Part I covers contributions ranging from 'Health and Safety in the Laboratory' through 'Microbiology of Catheters' to 'Bioterrorism'. Parts II-V contain review papers dealing with bacteriology, virology, parasitology and mycology, respectively. These papers are not dedicated solely to detail of microbiological study in the laboratory, but deal with disease entities; hence, most articles have titles such as 'Botulism', 'The Common Cold', 'Malaria' or 'Candidiasis'.

All the articles are written in very clear English and are referenced in a conventional scientific manner. Consequently, they make excellent reading for those who need an authoritative overview of a topic for introductory or revision purposes. A lapsed microbiologist such as your reviewer found this compilation both stimulating and salutary in exposing the limited nature of one's knowledge. The appendix that lists relevant websites is also useful.

Every library that serves biomedical scientists should purchase a copy of this book immediately because I am not lending mine to anybody! □

D. J. Rogers

Medical Microbiology

C. Mimms, H.M. Dockrell, R. V. Goering, I. Roitt, D. Wakelin, M. Zuckerman. London: Mosby (3rd Edn), 2003: pp 660. ISBN 0 7234 32597. £35.99.

Although now in its third edition, I have not had a copy of this book in my hands before. Its overall appearance is very impressive, as is the wealth of information within its cover. Such wealth does not come lightly, however, as the book weighs nearly 3 kg!

I have criticised many UK microbiology textbooks because of the paucity of colour in illustrations and page design. Our US colleagues produce much more attractive textbooks that are often no more expensive to buy. This book, however, has over 480 colour diagrams, figures and photographs, with touches of colour on the pages to distinguish different sections of the book.

So, it has colour, but what about the quality of the information provided? It is excellent for several reasons. The authors have rejected the traditional catalogue of organisms with listed characteristics and updated control measures. They have also spurned the simplistic 'microbe + host = disease' concept because most host-microbe contacts do not