BOOK REVIEWS

Prions Prions Prions

CTMI 207 Current Topics in Microbiology and Immunology
Edited by S. B. PRUSINER. 1996. ISBN 3-540-59343-8.
Springer-Verlag, Berlin. Pp. 163. DM 168.00.

Prions, Prions, Prions is a slender volume which comprehensively reviews current concepts surrounding the infectious, inherited and sporadic forms of the transmissible encephalopathies, as seen from the perspective of the prion hypothesis. In view of the topicality of bovine spongiform encephalopathy (BSE), this book will appeal potentially to a wide audience. Microbiologists may be disappointed that the volume is dominated by the genetic and molecular aspects of these disorders, reflecting the perception of the fundamental event in prion propagation as the conversion of host protein by an α -helix to β -sheet structural transition. Infectious forms receive little attention and there is no attempt to cover earlier work on these agents such as that on orally transmitted kuru, and the observation in experimental animals that the titre of the agent within the brain reaches maximal levels before the onset of neuropathological changes and symptoms. However for the reader who requires an update on the leading edge of research into the prion hypothesis, this volume can be recommended. Written by researchers who are actively involved and widely known in the field, the contributions are well illustrated and fully referenced. Inevitably, their readability is variable but mostly good.

D. W. BURDON

Practical Food Microbiology

Edited by DIANE ROBERTS, W. HOOPER and MELODY GREENWOOD. 1995. ISBN 0-901144-36-3. Public Health Laboratory Service. Pp. 240. Hardback £34.95.

Public awareness, media interest, legislation and changes in eating habits have increased the need for vigilance in the preparation, sale and consumption of foodstuffs. Food manufacturers and processors have a legal duty to show due diligence in their activities with respect to food safety, and environmental health officers have wide powers to ensure protection of the public. These factors combine to enhance the need for microbiological surveillance, whether as quality control of processes and product sampling, or investigation of complaints and food-poisoning outbreaks.

This manual brings together the experience gained by the national network of PHLS laboratories which, through widespread examination of food, has resulted in the development of methodologies appropriate to the requirements of producers, purchasers and inspectors.

Following a brief section on sampling indications and interpretation of results there is a concise resume of legislation, codes of practice and microbiological criteria. The schedules of tests for the examination of food are produced in alphabetical order of food products and, where appropriate, include microbiological criteria from published legislation and voluntary codes of practice. The clarity of layout and simplicity of the cross reference system to methods for each test are commendable.

There are sections on sample preparation, bacterial enumeration and the isolation and enrichment of micro-organisms from food samples. Dairy and egg products merit individual sections and the confirmatory biochemical tests most often required are described. Some of these are illustrated in a series of high quality colour plates, together with typical morphologies of commonly encountered food-borne organisms on appropriate selective media. Supported by a quick reference guide to microbiological tests, flow diagrams of procedure and helpful lists of addresses for guidelines and reference facilities, this is an excellent volume on the subject.

Whilst many medical microbiology laboratories outside the PHLS will not be undertaking routine food examination, there is nevertheless a frequent need to answer questions relating to the subject, and it is rewarding to have the necessary information available in a single volume of such clarity. This book is a practical guide but is also recommended to microbiologists as a reference work from which essential information on the laboratory examination of food and interpretation of results may be readily extracted.

D. E. HEALING

Molecular Basis of Virus Evolution

Edited by A. GIBBS, C. H. CALISHER and F. GARCIA-ARENAL. 1995. ISBN 0-521-45533-2. Cambridge University Press. Pp. 603. £65.00.

This book is a collection of papers presented at a meeting in December 1991. The publication date was 1995, a delay which puts in doubt the editors' intent that it is 'state-of-the-art'. Nevertheless, the basic concepts are here and of fundamental importance to an understanding of the subject – the evolution of viruses.

Changes in the genome occur as viruses replicate and this results in a mixed population. External selective pressures, for example, the immune response of the host or anti-viral agents, exerted on this population may favour an alteration in the phenotype to better suit the new environment. Before methods for analysing genes in detail were available, such changes were studied epidemiologically in terms of natural selection (e.g., myxomatosis in Australian rabbits).

Gene sequencing opened up many new avenues of research. The existing phenotypic classification of viruses could be re-examined. Information obtained shows that many very different viruses share similar genes (evolved from a common parental gene) which control an essential action. Also, homology with cellular genes has been found, suggesting a source for some viral sequences. Point mutations that have caused a change in virulence have been discovered.

Degrees of relatedness in time or geographic area are reflected in the number of changes in the genes. The more changes, the more distant the relationship, so a picture can be built of the origins, rates of change and relationships in a virus group. These can be diagrammatically shown as a

phylogenetic tree. Part IV of this book gives many examples of these in dealing with the evolution of specific viral taxa.

Another important concept is that of quasi-species. RNA viruses have mutation rates of about 10^{-3} /nucleotide position/replication cycle which allows rapid changes in the genome – up to 1%/year in some viral populations, such as HIV-1. Consequently, it can be seen that a genome is not 'a defined unique structure but rather ... a weighted average of a large number of different individual sequences.' In this mixture of genomes, the quasi-species, the master sequence(s) can evolve rapidly (HIV-1) or remain static for long periods of time (Avian Flu A).

As in any compilation the quality of writing and ease of comprehension varies greatly between authors. Many important concepts are covered and it is a pity that this book falls between two readerships. It is too complex for the average reader with an interest in the subject and could well be out of date for the expert.

J. B. KURTZ

PCR: Protocols for Diagnosis of Human and Animal Virus Diseases

Edited by Y. BECKER and G. DARAI. 1995. ISBN 3-540-58899-X. Springer-Verlag, Berlin. Pp. 596. DM 168.00.

The polymerase chain reaction (PCR) has become firmly established in all branches of molecular biology and has revolutionised the laboratory diagnosis of infectious disease, particularly those caused by viruses. Theoretically any infectious agent can be detected and characterised by PCR (with the possible exception of prion-associated encephalopathies) provided the nucleotide base sequence of a conserved (i.e., evolutionary stable) region of the agent's genome is known.

This spring-bound book is divided into three sections. The first describes around 50 protocols for the detection and characterisation of viruses important in human disease. Part II gives 12 protocols of particular interest to those who care for livestock. A final, short section describes improvements in DNA and RNA preparation for PCR and the use of personal computer software in the design of PCR protocols.

This is a multi-author book with over 200 contributors. Therefore, there is some repetition and inconsistency of style, but this is minimal. It is not written for a PCR novice, and assumes full knowledge of PCR basics, such as oligonucleotide primers and thermal cycling. It is an exceptionally useful book that will soon become dog-eared in any molecular biology laboratory. But, included with the book is a computer diskette containing the *whole* book as document files. The publishers should be commended for such rare courtesy.

G. BEARDS

Infection and Immunity

J. PLAYFAIR. 1995. ISBN 0-19-854926-1. Oxford University Press. Pp. 154. Hardback £20.00, paperback £9.95.

At first glance, this book appears as a yet another book on 'Immunity to Infection'. However, this one is enjoyable to

read and simple enough for even an 'interested lay person' to be able to understand it. Indeed, this is one readership population among many targeted by the author who presupposes no prior knowledge of microbiology or immunology. The targeted readership also includes students and potential students of science and medicine. Thus, as one would expect, a more informed graduate of science may find it a little simple.

The book consists of 20 short chapters that cover the important aspects of immunology, including natural and adaptive immune responses to pathogens and self antigens, the cellular basis of the humoral response and the functional attributes of the various cellular components of the immune system. In a series of lecture-style tutorials, the basic mechanisms of non-specific defence, antigen processing and presentation, immune-evasion by pathogens, immunodeficiency and autoimmunity are explained.

However, for a strict beginner a few more extensive graphical illustrations would probably have made the book even more enjoyable. The appendix consists of 10 selected infections which are discussed only briefly; this section could have been further expanded to accommodate more infections in slightly greater detail. Also, considering the target readership, the list of recommended books for further reading should have included more suitable books; for example, instead of Topley and Wilson's or Mandell's intimidating reference books, the more student-orientated medical microbiology text-book by Greenwood, Slack and Peutherer would have been more appropriate.

I certainly think there is a niche for this book among the specified target readership (i.e., beginners) and, therefore, would recommend it to first or second year students of microbiology and medicine.

D. ALA'ALDEEN

Oral Cephalosporins Volume 47 Antibiotics and Chemotherapy

Edited by R. C. MOELLER. 1995. ISBN 3-8055-6163-6. S Karger AG, Basel. Pp. 189. SFr. 216.00.

Is there a need for a book exclusively devoted to oral cephalosporins? The answer to this surely depends, in part, on whether one believes that there is a need for oral cephalosporins in the first place, and I hope that it is not too dismissive to suggest that this is far from being intuitively obvious. Certainly there are few, if any, infective conditions requiring oral therapy in which cephalosporins represent the natural first choice. The earlier compounds, like cephalixin and its almost identical congener, cephadrine, exhibit unimpressive intrinsic activity and are relatively slowly bactericidal, as their affinity for the penicillin-binding protein (PBP) targets is restricted to PBP-3. The newer ones, such as cefixime and cefibuten have important gaps in their spectrum that seriously impede their usefulness for infections in which oral therapy is appropriate. Although cefdinir and the oral cephalosporin esters are generally broader in spectrum, they still lack useful activity against enterococci, pseudomonads and bacteroides; furthermore, parenteral administration is often more appropriate when broad-spectrum therapy embracing opportunist gram-negative rods is felt to be necessary.

The contributors to this volume in the *Antibiotics and Chemotherapy* series have no such reservations, and if you