

of most molecular biologists. This book is also a useful companion to their publications, which out of necessity omit many of the practical steps the authors find essential to obtaining high-resolution sequencing gels. Finally, many of the comments in the appendix are applicable to the general

problems encountered in DNA isolation, hybridisation, sequencing and autoradiography, which makes the book useful to those who simply wish to be informed, and an 'essential buy' for genomic sequencers.

D. Hornby

Molecular Biological Methods for *Bacillus*; Edited by C.R. Harwood and S.M. Cutting; John Wiley; Chichester, 1990; xxxvi + 581 pages; £75.00

Historically, cloning and studying *Bacillus* genes has often been problematical due to the structural and segregational instability of plasmid cloning vectors and the toxicity of *Bacillus* DNA in *E. coli*. These problems have now been overcome and two chapters in *Molecular Biological Methods for Bacillus* comprehensively describe the current methods of choice for cloning *Bacillus* genes, that is, the use of phage vectors in a chapter on gene cloning techniques, and the use of integration or transposon derived vectors. The integration of genes into the chromosome confers many advantages over the use of plasmids and vectors which exploit the efficient homologous recombination activity of the *Bacilli* dominate studies of the molecular genetics of these organisms. The difficulties of using plasmids as cloning vectors and current knowledge of the mechanisms of deletion formation by many commonly used *Bacillus* plasmid cloning vectors are extensively reviewed in this volume, justifiably including a considerable informational input for a methods book. Most other aspects of molecular genetics are covered with chapters on the measurement of gene expression, genetic analysis, bacteriophages and a genetic and physical map of the *Bacillus subtilis* chromosome. The chapter on gene expression includes methods on the purification of *Bacillus* RNA polymerase and this may well be of use to workers interested

in other bacteria displaying RNA polymerase heterogeneity. Basic microbiological techniques are included, i.e. growth and maintenance of strains, sporulation and germination. More specialist topics are on the *Bacillus* cell envelope and secretion, DNA repair and replication. Although the appendix on the *Bacillus subtilis* sequence data base will fast be out of date, it provides information on how to communicate sequence data effectively to all other researchers in the field and is a starting point for newcomers. The book also includes appendices describing media, and the *Bacillus* genetic stock centre. Most notably absent from this book is a detailed chapter on the development of strains and the design of vectors for the use of *Bacillus* as a host for expressing and secreting foreign proteins. Minor points are that information is sometimes repeated (e.g. UV-mutagenesis procedures), and there is often a failure to cross-reference between contributions by different authors. The mixture of basic microbiological methods and techniques for molecular genetics specifically in the *Bacilli* make this book extremely useful to researchers already working with *Bacilli* and to scientists seeking to apply new techniques and approaches to other organisms.

M.C.M. Smith

Molecular Basis of Bacterial Pathogenesis (Volume XI of 'The Bacteria: A Treatise on Structure and Function');
Edited by Barbara H. Iglewski and Virginia L. Clark; Academic Press; San Diego, 1990; xi + 473 pages;
£85.00

The study of the methods by which bacteria cause disease has contributed much to modern biology; think of Pasteur's work on fundamental immunology, or that of Griffith on the transforming principle in *Streptococcus* that turned out to be DNA. It remains a field of which the investigation requires a broad knowledge of biology from epidemiology to chemistry: the physiology of the host and its interaction with the invading organism; the structure and biology of the bacteria and the virulence factors that they produce; the genetics, molecular biology, biochemistry and protein structure of these factors. Yet it is surprisingly difficult to decide what is important and what is not; many pathogenic organisms produce proteins that superficially appear to be involved in

disease and have been studied for many years, but importance of which as a virulence factor is still controversial.

This volume, one of a series, deals with all these topics. But there is a sense in which its title 'Molecular Basis of Bacterial Pathogenesis' fails to deliver, and could even be misleading. It is not a comprehensive treatise of the field: it would certainly not do as an introduction or as a text book. But it is an interesting collection of papers usually describing recent research on a wide range of relevant topics. Many well-known pathogens such as *Salmonella*, *Neisseria* and *Vibrio cholerae* are discussed; other infamous bacterial diseases such as tetanus or pertussis (whooping cough) are mentioned only in passing.

The book starts with a short but imaginative chapter, ambitiously titled "The 'Zen' of Bacterial Pathogenicity", setting the scene for what follows, suggesting the way the subject is likely to change, and emphasizing the importance of the host. There is a chapter on relevant population genetics, and the remaining 18 chapters are divided into three sections: 'Surfaces and Colonization', 'Invasion and Intracellular Growth', and 'Toxins'. They vary in the width of their coverage: from detailed chapters on specific factors,

such as iron acquisition in *E. coli* and other organisms, to more general chapters covering a whole field, for example *Salmonella* pathogenesis.

This is a book which will prove valuable to those already conversant with the outline of the subject. It deals authoritatively and interestingly with many systems not well reviewed elsewhere. Those who need it will highly value it.

S. van Heyningen

Modern Methods in Protein- and Nucleic Acid Research: Review Articles; Edited by H. Tschesche; Walter de Gruyter; Berlin, 1990; ix + 446 pages; DM 330.00

This is a rather diverse mixture of 20 articles of which the overall aim is to allow chemists and molecular biologists the opportunity to evaluate a series of methods used in protein and nucleic acid research. The variety of contributions is extensive, both in area and quality, and this detracts from its usefulness to the individual as no-one will have such a wide range of interests. A second point that identifies this volume for library purchase only is the price. I would have thought that a book containing several articles promoting methodology being commercially advertised might have been subsidised by the interested companies.

Some of the papers are simply research articles and, for example, the final article on the NMR analysis of ribonuclease T1 would have been much better had it included an explanation of the background, potential and limitations of the method. In contrast, the paper on CD spectral analysis describes not only its range of application and advantages over other methods but also gives an outline of the theory, instrumentation and applications.

It is this latter type of contribution which gives this book its value. There is an interesting article on DNA diagnostics which explains nucleic acid hybridization and the use and limitations of radioactive probes in clinical laboratories. This is followed by a consideration of several, alternative probes and here the contrast with the opening article, which considers digoxigenin-dUTP labelled probes exclusively, is significant.

There are other, specialized articles on free-flow electrophoresis, tentacle-type ion exchangers, ion-spray mass spectrometry, analysis of racemization of amino acids and the raising of antibodies to thymosins. While these areas may be of value to the specialist, they are treated in a manner which

reduces their interest to the more general reader.

And yet it is difficult to be critical on these grounds as I found equally specialized articles on C-terminal sequencing of proteins and the use of spin-labelling techniques in the study of membrane proteins to be of interest. Nevertheless I feel that the best of this collection were the articles on protein crystallization and protein structure modelling which are excellent reviews that I would be happy to recommend to the graduate or even undergraduate students. Also in this category, though more specialized, were the articles on photoaffinity labelling and the erudite and comprehensive essay concerning the prediction of what might form a good epitope for generating anti-peptide antibodies.

For the molecular biologist there are valuable articles on methods of construction of oligonucleotide-directed mutations and on the problems encountered during the isolation and refolding of fusion proteins. It is a pity that these are not linked with the presentation on the construction and use of columns containing immobilized metal ions for isolation of fusion proteins with histidine tails as this is a potentially valuable technique. As it is, the latter article appears earlier in the book, distinct from the other two on a similar topic.

I would have liked to have seen more editorial input into this volume to provide a theme to tie the articles together, to correct the English and to insert Greek symbols where appropriate. Despite these criticisms, and the price, I would think this book should be on the library shelves for the half dozen or so very valuable reviews that it contains.

R.L.P. Adams

Protein Structural Analysis, Folding and Design; Edited by M. Hatano; Japan Scientific Societies Press, Tokyo/Elsevier, Amsterdam, 1990; viii + 237 pages; Dfl. 185.00, \$ 97.25

The combination of site-specific mutagenesis of proteins with experimental data obtained by physico-chemical techniques, particularly X-ray crystallography, has greatly extended our

understanding of the features of protein molecules that are responsible for their 3-dimensional structures, functional properties, stabilities and, above all, their exquisite