

oligomer composition. However, the book does include protein purification with a short chapter on affinity procedures and some other methods appear elsewhere. HPLC separation of mixtures of proteins is covered, together with peptide separations, in a later chapter. Here a very brief description of ion-exchange HPLC, partly in the guise of FPLC, is largely concerned with what it can do rather than how to do it – suggestions that one should read Pharmacia literature for practical details are hardly compatible with a handbook.

If you have a pure protein, information on how to characterize it (including post-translational modifications) and obtain amino acid sequence data forms the bulk of the book. Analytical methods, the editor's contribution, is a chapter forming almost one fifth of the text, and I suspect it will be difficult not to find the recipe you want in this comprehensive collection of amino acid separation, protein and amino acid quantitation methods and protein staining procedures. There are a number of chapters on chemical and enzymic protein cleavage methods and manual and

automatic sequencing procedures which include tips and 'hands-on' advice. This is the meat of the book and it yields a rich and comprehensive information source.

Three final chapters cover electron impact mass spectrometry, X-ray crystallography and electron microscopy, and protein structure prediction. These are justified by the editor on the grounds of general interest, but the space given over to them, with coverage at a level incompatible with the handbook title, could have been used to allow more comprehensive descriptions of the preliminaries to most protein characterisations – the purification processes.

The strengths of this book are apparent but it does not have the balance I had expected; given the price, prospective purchasers should ensure by careful perusal of the contents that it is a handbook for them. It will not satisfy all protein chemists, although anyone of that ilk will find a lot of useful information.

M. Landon

New Comprehensive Biochemistry – Volume 11A

Modern Physical Methods in Biochemistry. Part A

Edited by A. Neuberger and L.L.M. van Deenen

Elsevier Science Publishers; Amsterdam, 1985

427 pages. \$66.75, Dfl.180.00

No experimentally based scientific subject can progress without the development and application of specific techniques which can reveal new and often unexpected facets of the physical world. In the last 20–30 years we have increasingly seen the impact of techniques developed by physical scientists on biological systems and the emergence of scientists who have specialized in the application of particular physical methods to biochemical and biological problems. This volume, which is to be followed by a second dealing with more physical methods, consists of five chapters written by ex-

perts in the application of particular physical methods to biochemical problems. Apart from Chapter 5 (Protein Crystallography by L.N. Johnson) the emphasis of this volume is on spectroscopic methods. Insofar as each chapter is self-contained (although there are some loose cross-references) a few comments on each chapter are apposite.

Chapter 1 (J.K.M. Roberts and O. Jardetzky) deals with nuclear magnetic resonance (NMR) and as the authors state is intended for beginners. The principles of the subject are presented with clarity

and appropriate brevity with essential references to more detailed texts. The object of the chapter is to give the reader an 'orienting overview' of the field as it has developed. The authors deal with relaxation mechanisms, cross-relaxation and the nuclear Overhauser effect, briefly with NMR spectrometer design before passing on to biochemical applications which include, for example, quantitation of metabolites, intracellular pH measurement and metabolic compartmentation and the study of macromolecules *in vitro*.

Electron spin resonance is covered in Chapter 2 (R.C. Sealy, J.S. Hyde and W.E. Antholine) the introduction to which tells us that there are 2000 papers per year containing ESR data! The beginner is not advised to start here. The chapter gets into nitroxide probes after 4 pages. Biological free radicals in a variety of systems are discussed and there is a substantial section on the effects of paramagnetic transition metals. A very comprehensive chapter with almost 300 references.

The longest chapter of the book (Chapter 3, 124 pages) is devoted to Mass Spectrometry (J.C. Tabet and M. Fétizon) which as a result of the development of new peripheral techniques (e.g. the coupling of MS with gas chromatography) and new ionization techniques has had an enormous impact on the analysis of both chemical and biochemical molecules in recent years. This chapter, which is largely addressed to the expert, concludes with a detailed discussion of applications to steroids, peptides, polysaccharides, antibiotics, heterocycles and alkaloids. It is a valuable survey of both the methods used and the power of the technique.

In contrast to NMR, ESR and MS, circular dichroism (CD) and the associated technique of

optical rotatory dispersion (ORD) are not perhaps central services in many laboratories. However, most biochemists are well acquainted with the application of CD and ORD, particularly to the determination of protein secondary structure. The chapter by D.W. Urry (Chapter 4) gives a very clear exposition of the theory behind these techniques, which could be recommended to an undergraduate. The applications naturally cover polypeptide conformation, the knotty problem of light scattering in CD is considered in depth and the chapter concludes with an application to the purple membrane of *Halobacterium halobium*. The author has struck a good balance between theory and application here.

At the time of writing L.N. Johnson (Chapter 5, Protein Crystallography) states that there are well over 200 protein structures which have now been solved by X-ray diffraction methods. The discussion of these methods is one of the most readable the reviewer has come across. Directed to the biochemist and the biochemistry undergraduate the chapter gives an excellent overview of the techniques and clearly emphasises the rate-limiting step in structure determination – the problem of obtaining protein crystals. Recent developments including discussions of the value of molecular dynamics, synchrotron radiation and neutron diffraction are included. This is a most illuminating contribution.

The volume is well produced and should be an essential purchase for any comprehensive academic library. It is a valuable source book for practitioners and teachers of physical biochemistry and this reviewer will be looking forward to Part B.

Malcolm N. Jones

Basement Membranes

Edited by S. Shibata

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The publication of the Proceedings of the First International Symposium on Basement Membranes

held in Japan is particularly timely. Rapid progress in our understanding of the chemistry of the

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