

tools. Some of the enzymes in this volume are, in fact, better known to, and widely used by, many research workers as simply 'reagents'; e.g., pancreatic and T<sub>1</sub> RNases, which played a key role in the classical work of Holley and coworkers in 1965 on the sequencing for the first time of a natural nucleic acid, tRNA<sup>Phe</sup>. Almost one-half of ch. 17 on polynucleotide phosphorylase, by U.Z. Littauer and H. Soreq, is devoted to an excellent and exhaustive survey of its applications to polynucleotide synthesis, preparation of oligonucleotides with defined sequences, synthesis of labeled nucleotides, fingerprinting of oligonucleotides, and probing for the regulatory function of the 3'-OH region of RNA. Considering how little is known about the physiological function of this enzyme, it is impressive to note its utility, first exploited by Grunberg-Manago and Ochoa for the synthesis of polyribonucleotides, and subsequently by Nirenberg,

Ochoa, Khorana and coworkers in the use of the latter as messengers to establish the genetic code. Additional applications described include the use of the vaccinia capping enzyme, by S. Shuman and J. Hurwitz, for highly specific end-labeling of RNAs that contain 5'-diphosphate or triphosphate termini; and of T4 RNA ligase, by O.C. Uhlenbeck and R.I. Gumpert, for oligonucleotide synthesis and introduction of various modifications into natural RNAs.

This volume is nicely organized and well printed. The inclusion of references at the bottom of each page of the text, which probably increases printing costs, certainly facilitates reading. The subject index is fairly extensive, a useful feature for such a volume.

David Shugar

## *Topics in enzyme and fermentation technology; volume 6*

Edited by A. Wiseman

*Ellis Horwood/Wiley; Chichester, New York, 1982*  
232 pages. £21.50

The present volume is the sixth in an annual series, which began in 1977, dealing with various aspects of enzyme and fermentation technology. It contains 6 chapters which are somewhat uneven in length and in quality.

The first 2 chapters deal with antibiotics. In the first of these, C.J. Coulson has written a 12 page discussion of the biosynthesis, mode of action and protein binding properties of the 4-hydroxycoumarin antibiotics. This is followed by a longer survey (35 pages) by M.E. Bushell of the search for novel antibiotics formed as secondary metabolites by fungi. The function of secondary metabolism in the producing organism is often unknown, but the production of these new compounds represents an area of great biotechnological potential.

In the third chapter, S.A. Barker presents a short review of the interactions between proteins and acidic polysaccharides which represent new approaches to enzyme stabilization. The topics cov-

ered include the possible reactivation of enzymes which have been thermo-inactivated.

The next 2 chapters deal with yeast physiology and biochemistry. In the first of these, B.H. Kirsop reviews recent developments in beer fermentation, including continuous fermentation vessels, the control of flavour substances – where the relationship between beer flavour and its chemical composition still remains an area of active research – and the genetics of brewing yeasts. The use of the yeast mitochondrial system for the testing of anti-mitochondrial drugs and mutagens is described by D. Wilkie. The yeast system appears to be most efficient for the detection of specific or selective activity against mitochondrial function and biogenesis.

The final chapter by D.J. King and the editor is a comprehensive review of microbial oxygenases and their potential application. The dioxygenases are particularly important for the cleavage of both

homocyclic and heterocyclic aromatic rings, whilst the monooxygenases include the cytochromes P450 from various yeasts which can be utilised, for example, in the preparation of many useful chemicals.

Overall, the volume represents a useful addition

to the biotechnological literature, which can be read with profit by all who are interested in the more applied aspects of biochemistry and microbiology.

D.J. Manners

## *Proteolytic Enzymes, part C*

### *Methods in Enzymology; volume 80*

Edited by L. Lorand Editors in chief: S.P. Colowick and N.O. Kaplan

*Academic Press; London, New York, 1981*

xxviii + 920 pages. \$74.00

This fairly bulky volume maintains, and perhaps even extends, the scope and known high standards of preceding ones in this series. Bearing in mind the recent renewed interest in proteolytic enzymes and their physiological functions, it is of obvious value to find in one text such a comprehensive account of the complement system, methods of isolation, enzymatic activities of the individual components, and mechanisms of activation.

The 64 contributions collected here are subdivided into 6 general sections: I, Complement; II, Blood clotting; III, The plasmin system; IV, Enzymes involved in blood pressure regulation; V, Proteases of diverse origin and function; VI, Inhibitors of various specificities.

Section V, of special interest to the laboratory of this Reviewer, includes extensive coverage of the properties of lysosomal cathepsins and their role in metabolism in humans, with particular emphasis on cathepsin G and elastases isolated from leucocytes. The clarity and conciseness of this section, having in mind the voluminous literature in these

fields, is due in large part to the contributions of A.J. Barrett. A useful adjunct to the foregoing is section VI, dealing with the properties of inhibitors and their affinities for various cathepsins.

The foregoing positive features are equally applicable to virtually all the contributions in this book. The bibliographies are well up-to-date, including references to numerous papers still in press. And, as one has generally come to expect for volumes in this series, the subject index is well compiled and sufficiently detailed to enable rapid location of any desired topic.

The Editor is to be commended for his organization of the present volume, which is a must for many libraries. In addition, it should be pointed out that it is not merely a review of the literature, but at the same time a useful laboratory manual. Notwithstanding the price, it is therefore worth having at one's direct disposal in the laboratory.

David Shugar