

sections on the structure of DNA and on the nature of mutation and recombination. Secondly, and more seriously, however, very definite statements are made which are not correct such as (page 121) 'phage  $\lambda$  transduces only genes next to its prophage insertion site' or (page 127) that the spontaneous excision of  $F$  from an  $Hfr$  always gives rise to an  $F'$  carrying bacterial DNA. This is in part because the text suffers from the under-use of the qualifying adverbs sometimes, generally and possibly, creating the impression that the process being described is the only one that can occur in the circumstances.

Of the experiments included, about a quarter are not likely to find favour in other laboratories either because the material chosen (*Serratia marcescens* and its phage *Kappa*) are not in general use or because the techniques are somewhat esoteric (5-flourouracil phenocopying, transfection to spheroplasts, auanography: an unfamiliar term). In a book of this sort, greater concentration on popular techniques would have been preferable. It would have been very

desirable, for instance, to have included some gel work. (Incidentally, I would never trust a group of 3rd year students to handle dangerous carcinogens such as nitrosoguanidine!)

This book inevitably invites comparison with Jeffrey Miller's 'Experiments in Molecular Genetics'. Miller's book is compelling reading and a superb research tool. It is, however, too specialised and too expensive for use other than as a reference work in a course for undergraduates.

Bearing these limitations in mind, I think 'Bacterial, Phage and Molecular Genetics' could find considerable use as a text. Though fairly expensive it is not prohibitively so. It includes workable experiments involving techniques and materials commonly in use. It contains problems, results and pertinent discussion on how to record data. I think a student who had used this book would have had a good introduction into the research methods used currently in molecular biology.

Millicent Masters

### *The Specificity and Action of Animal, Bacterial and Plant Toxins*

Edited by Pedro Cuatrecasas

Chapman and Hall; London. Halstead Press; New York, 1977

ix + 345 pages. £ 15.00

This book, the first in the specialised series B of 'Receptors and Recognition', discusses a number of selected toxins from different organisms and describes the way they interact with their target cells, and how they specifically inhibit cellular processes.

There are eight chapters in this book. Five are devoted to protein exotoxins of microbial origin. Although some articles include information on more than one toxin, those primarily discussed are, cholera toxin (cholera toxin) and its universal stimulation of adenyl cyclase in the plasma membrane; diphtheria toxin which inhibits protein synthesis by catalysing an adenosyl diphosphoribosylation of elongation factor-2 (EF-2) using  $NAD^+$  as substrate; colicin  $E_3$  which cleaves 16 S ribosomal RNA in the intact

ribosome of sensitive Enterobacteriaceae, the cleavage being at one specific site near the 3'-end of the RNA where sequences for the binding of mRNA to the 30 S subunit are located; tetanus toxin and its blocking of neurotransmitter release in the inhibitory neuronal pathways of the central nervous system; and various cytolytic toxins from Gram positive and Gram negative bacteria which disrupt membrane integrity either by physical or a variety of different chemical methods. Half of one chapter is devoted to a discussion of botulinum toxin and its inhibition of acetyl choline release from peripheral nerve endings, the second part deals with  $\beta$ -bungarotoxin, from the venom of the Formosan banded krait. Both toxins cause spastic paralysis, but  $\beta$ -bungarotoxin alters the  $Ca^{2+}$

ion flux, and facilitates acetyl choline release from nerve endings.

Of the two remaining chapters, one is devoted to the plant toxins abrin, ricin, and their derivatives. These toxins inhibit an elongation reaction in protein synthesis, although the precise one is still disputed by some workers. Finally, there is a chapter on the steroidal alkaloid, batrachotoxin, which has been isolated from the skin secretions of the Kokoi, a South-American frog. The toxin exerts its action by binding to cell membranes of electrogenic tissues. The binding results in the opening of  $\text{Na}^+$  ion channels through the membrane and consequently alters the potential difference across these membranes.

This book should have wide appeal. Primarily written for research workers, it will nevertheless be appreciated by final year undergraduates and by others wishing to widen their biochemical knowledge.

Each chapter is written so that readers with different backgrounds can fully appreciate the information in the article. A common format has been used by all the authors. An article is divided into several sections usually along the following lines:

- (i) Introduction and history.
- (ii) Purification, structure and chemical studies on the toxin.

- (iii) Interaction of the molecule with the plasma membrane.
- (iv) The mechanism of action of the toxin, usually the major section.
- (v) Concluding remarks such as practical applications and future research. This format allows easy comparison of the information in the individual reviews.

The authors are authorities on the topics they are discussing. Therefore, each article is critically written and is full of interesting current information. The discussions are amplified by a copious use of examples and comparisons of toxin effects in different cells and organisms. Most chapters present many examples of original data (tables, graphs, etc.) to augment the text, and original literature is exhaustively quoted.

I have two criticisms. The chapter on colicin  $\text{E}_3$  despite its high quality is rather misplaced in a book otherwise devoted entirely to toxins affecting eukaryotes. Secondly, there are too many minor printing mistakes in many of the chapters. Thus, it is difficult to convince oneself that the text is totally free of small factual errors inadvertently incorporated.

The book will satisfy a need for many people. It covers wide areas of biochemistry and places them in one volume. Personally, I found the articles very enjoyable to read and extremely informative.

Kelvin E. Smith

### *Essays in Neurochemistry and Neuropharmacology, Volume 1*

Edited by M. B. H. Youdim, W. Lovenberg, D. F. Sharman and J. R. Lagnado  
John Wiley and Sons; London, New York, Sydney, Toronto, 1977  
195 pages. £ 9.90, \$ 19.50

Many neuroscience journals now publish short reviews on specialist topics meant for the expert. The undoubted success of 'Essays in Biochemistry' indicated the need for a different kind of inexpensive publication written as an up-to-date essay, intelligible to finale-year and postgraduate students. This first of a similar series on neurochemistry and neuropharmacology partially meets the requirement. I

found the articles both stimulating and enjoyable. One was left in no doubt that neurochemistry and neuropharmacology are exciting fields of research of enormous future potential. However, most of the contributions turned out to be a cross between a chapter in a specialist textbook and a learned review.

The properties and function of methyltransferases are described in the first essay. Transmethylases are