

Book Reviews

A Guide to Molecular Pharmacology-Toxicology. Parts I and II. Edited by R. M. Featherstone. Marcel Dekker, New York, N. Y. 1973. Part I, xiv + 425 pp. 16 × 23.5 cm. \$29.50. Part II, xv + 385 pp. 16 × 23.5 cm. \$27.75.

Professor Featherstone and 30 contributors have presented a wealth of interesting and useful information in these two books, which comprise Volume 2 of the "Modern Pharmacology Series." A broad range of topics is covered and, if there is a general theme, it is directed toward studies of the interaction of small molecules with membranes and membrane constituents including enzymes and pharmacological receptors. It is interesting that the editor emphasizes that "no great thread of continuity" among the chapters was intended; rather a variety of model systems and methodologies are discussed.

Part I contains ten chapters. The first chapter is titled "The Use of Models of the Cell Membrane in Determining the Mechanism of Drug Action" and the presentation is based on the excitable membrane of the nerve cell axon. Most of the chapter is taken up with discussions of anesthetic-membrane interactions, inhibitors of bioelectric activity (tetrodotoxin, tetraethylammonium compounds), and the mechanism of action of DDT toxicity including structure-activity relationships of DDT analogs. This chapter, like nearly all the chapters in this work, is largely descriptive and, therefore, one does not have to be an expert in the field in order to profit from it. The next two chapters are concerned with membrane transport receptors for monosaccharides and ultrastructural contributions to molecular pharmacology, the latter emphasizing the hepatic endoplasmic reticulum. A chapter on isolation and characterization of pharmacological receptors includes both general considerations and discussions of cholinergic receptors and acetylcholinesterases. A relatively brief but intriguing chapter which weighs the utility and limitations of homologous series of compounds in structure-activity studies is followed by one containing a comprehensive analysis of the interactions of narcotic agonists and antagonists with analgesic receptors. The remaining chapters describe the *d*-tubocurarine receptor, conformational changes induced in proteins by drug molecules, the molecular pharmacology of acetylcholinesterase, and, finally, enzyme kinetics. This last chapter is a useful review of the fundamentals of enzyme kinetics supplemented by examples of practical applications to evaluations of inhibitor activity.

Part II, consisting of 11 chapters, opens with a discussion of intermolecular forces and the pharmacology of simple molecules in which the emphasis is upon anesthetic mechanisms. Two briefer presentations describe the function of the myoglobin molecule as influenced by anesthetic molecules and the role of the noble gases in molecular pharmacology. Although the topics of these three chapters are biophysical in nature, the authors again have been mainly descriptive in their treatments. A chapter on the role of steroid hormones in the induction of specific proteins is followed by one on the use of genetic variants in molecular pharmacology; the latter presentation again focuses on the interaction of gases with proteins. The next topics considered are the use of nuclear magnetic resonance spectroscopy in the study of drug-receptor interactions, the use of spin label technique for detecting drug-induced changes in membrane structure, and the use of optical activity to investigate the interactions of proteins with small molecules. The final three chapters describe the use of molecular orbital theory in pharmacological studies, calculation of the interaction of small molecules with large molecules, and the relative usefulness of lipids and proteins as models for studies in molecular pharmacology. As the above list of chapter subjects indicates, some of the topics in Part II require, by their very nature, a more mathematically oriented presentation than do the topics in Part I.

In general, the editor and contributors deserve credit for lucid and well-referenced discussions of timely subjects. These books would be valuable additions to the personal libraries of graduate students in medicinal chemistry and pharmacology. However, in the opinion of this reviewer, the books are inordinately expensive and this fact alone will tend to keep them out of the hands of those who could make the most use of them. Once again, students (as well as most others) will have to resign themselves to waiting in line to use the library copies. It is also worth noting that Part I

has no author or subject indexes. Thus, in order to have these indexes for Part I, one must also purchase Part II. This arrangement appears to benefit the publisher but not those potential purchasers who may be primarily interested in the contents of Part I.

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Computer Fundamentals for Chemists. Computers in Chemistry and Instrumentation Series. Volume 1. Edited by J. S. Mattson, H. B. Mark, Jr., and H. C. MacDonald, Jr. Marcel Dekker, New York, N. Y. 1973. xi + 345 pp. 23.5 × 16 cm. \$19.75.

This volume is a compilation of introductory material on the theory of operation of the computer, presented mainly with relevant chemical examples. It is presented as a requisite introduction of material which serves as a base for subsequent volumes of the series, covering topics such as electrochemistry (reviewed in April 1973), spectroscopy, and Computer Assisted Instruction.

Much of the material in this volume is a restatement of that which is presented in an introductory college physics course, but from a slightly more applications-oriented point of view. Chapter 1 provides a most basic introduction to the computer, mainly by defining terms and components and illustrating the levels of programming languages. A brief 17-page introduction to Fortran is also presented. Chapter 2 contains a fascinating discussion of the principles and applications of the analog computer, and it does assume some knowledge of electronic circuitry and calculus. The analog computer is used to simulate the often complex multi-compartmental pharmacokinetic behavior observed in drug metabolism studies, and an understanding of this chapter will certainly contribute to a more effective use of these analytical techniques. The third chapter is written in a manner much like the second, on the basic principles of digital circuitry. Again, some background in logic and electronic circuitry would be helpful to anyone reading this chapter.

From this point, a more extensive discussion of programming languages is undertaken. In Chapter 4 the basic machine languages are briefly treated, followed by discussions of Fortran, Algol, and PL/I. The book makes no attempt to be comprehensive in its coverage and directs the reader to other texts for the necessary details of the languages. The discussion proceeds from programming languages into chapters on computer simulation techniques and on analog-digital interfacing. One particular chapter, Chapter 7, provides the interested reader with an excellent introduction to the requirements and problems of involving the interfacing and control of experiments with computers. This area is one of the most rapidly developing areas of instrumentation and one which will touch nearly everyone, sooner or later.

The final chapter, dedicated to learning machines, is probably potentially the most useful to the medicinal chemist. It is here that a great deal of background material on the subject of pattern recognition is presented. With progressively more applications of pattern recognition appearing in the literature, the medicinal chemist who understands its uses may find it quite valuable as a powerful aid to structure-activity correlations. Although the examples used in the text are not of direct medicinal interest (classification of mass spectra and ir spectra), the material does promote a clear grasp of the fundamental principles.

Overall, the book is probably useful to many people in the field, not so much as a reference work but as a general, fairly easily readable introduction to "how computers work." Generally, at the end of each chapter is a useful bibliography giving leading references to more detailed coverage of each subject. While this book might not be for Everyone, it is well recommended to anyone who has occasion to need an understanding of computer-operating principles.

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