Book Reviews

NMR Methods for Elucidating Macromolecule-Ligand Interactions: An Approach to Drug Design. Edited by Robert E. Handschumacher and Ian M. Armitage. Pergamon Press, Oxford, New York, Beijing, Frankfurt, São Paulo, Sydney, Tokyo, Toronto, 1990, 175 pp., $49.00. ISBN 0-08-040674-2.

This volume is the proceedings of the fourth Biochemical Pharmacology Symposium, held in New Haven, CT, in July 1989, and was also published as Volume 40, number 1, of the journal *Biochemical Pharmacology* in 1990. As the preface by Drs. Handschumacher and Armitage notes, multidimensional nuclear magnetic resonance (NMR) now permits understanding the structural factors that control interaction between ligands and their receptors in solution. Short review chapters by several leaders in the field clearly summarize research developments from their various laboratories. The volume is organized into sections representing topical areas of importance in NMR spectroscopy. Early chapters by J. H. Prestegard and D. L. Turner discuss the effects of motion and conformational mobility in peptides and proteins. Techniques for the analysis of bioactive peptide conformation and application to such systems as epidermal growth factor, bradykinin, a binding site peptide fragment of the nicotinic acetylcholine receptor, and cyclosporin are discussed by I. D. Campbell, R. E. London, K. Wüthrich, E. Hawrot, H. Kessler, and their respective colleagues. However, the majority of the book is devoted to the techniques for studying ligand–receptor interactions and their application to a variety of systems. The use of paramagnetic probes for analyzing the surface of an enzyme–ligand complex is described by K. D. Kopple. Transfer nuclear Overhauser effect (TR-NOE) methods for studying bound ligand conformation and their application to a number of systems including protein–DNA interactions, antigen–antibody interactions, an oligonucleotide–drug complex, and peptide–receptor complexes are discussed by A. S. Mildvan, P. E. Wright, R. Kaptein, L. G. Marzilli, A. M. Gronenborn, M. F. Summers, I. M. Armitage, J. Feeney, and their respective colleagues. The recently developed isotope-editing techniques for obtaining structural information on larger proteins and large enzyme–inhibitor complexes using ^{15}N and/or ^{13}C isotopically labeled ligands are reviewed by A. Bax, S. W. Fesik, and their colleagues. Standard computational techniques and some suggested new approaches for determining protein structure from NMR data are described by D. A. Case, G. R. Marshall, and their colleagues.

This volume is useful in providing an overview of current techniques used for peptide and protein structure and for determination of ligand–receptor interactions. Citations to important papers in the original literature appear to be fairly comprehensive through 1989, the date of the symposium. It will be a helpful addition to the library of anyone desiring a general perspective on the use of NMR for structure analysis in ligand–macromolecule systems, although most of the papers provide relatively limited detail on the experimental and theoretical methods used.

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Biopharmaceutics and Clinical Pharmacokinetics, 4th ed. By Milo Gibaldi. Lea & Febiger, Philadelphia, 1991, x + 406 pp., $42.95. ISBN 0-8121-1346-2.

The purpose of this textbook is to provide current and relevant principles in biopharmaceutics and clinical pharmacokinetics. Like the third edition, this textbook includes 15 chapters and two appendixes examining the relationships between biopharmaceutics and clinical pharmacokinetics. Each chapter has been updated and over 500 new references have been added to provide examples of recent developments. As with previous editions, this book is well written and easy to read.

Chapter 1 introduces the concepts of absorption, distribution, and elimination as well as the equations to design dosage regimens for various routes of administration. Chapter 2 briefly describes compartmental pharmacokinetics and elaborates on the application of noncompartmental analysis. These first two chapters, along with the appendixes describing methods for superposition and estimating the area under the curve, provide the reader with basic principles for the clinical application of pharmacokinetics.

Chapters 3–8 provide an in-depth discussion on the roles of absorption and bioavailability in drug therapy. Gastrointestinal absorption is divided into three chapters emphasizing the biologic and physicochemical considerations as well as the role of conventional oral dosage forms. Nonoral routes of drug administration and prolonged-release medications are discussed in Chapter 6 and 7. Chapter 8 follows with a description of bioavailability and hepatic first-pass metabolism, including regulatory and clinical considerations.

The influence of pharmacokinetic and pharmacodynamic variability associated with drug disposition is discussed in Chapters 9–15. The relationship between drug concentrations and pharmacologic response is examined in Chapter 9. Under the heading "Drug Disposition," Chapters 10 and 11 review the principles of distribution and elimination. The effects of body weight, age, sex, genetic factors, disease states, and drug–drug interactions are discussed in the following three chapters, entitled "Pharmacokinetic

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