
Three-dimensional structures of water soluble and membrane-bound proteins are important because they have functional significance. Approaches to protein structural analysis differ depending on whether they exist in aqueous solution or are part of a lipoidal membrane. The book edited by Stephen White emphasizes methods to elucidate the three-dimensional character of proteins imbedded in membranes. The sixteen chapters are well written and include four initial chapters on protein structure in general, signals for targeting proteins to different cellular membranes, folding of water-soluble and lipophilic proteins, and determination of lipophilic sequences in a protein structure (hydropathy plots). In general, water soluble proteins fold with their hydrophilic portions hidden whereas membrane proteins have hydrophobic surfaces and hydrophilic inner portions. This allows many membrane proteins to serve as ion channels. Methods discussed in subsequent chapters are vibrational spectroscopy, circular dichroism, high resolution crystallography, site directed spin labeling, nuclear magnetic resonance and x-ray and neutron diffraction. Several biological approaches to analysis of membrane protein structure are also discussed. One involves gene fusion methods in which an enzyme (e.g., alkaline phosphatase) replaces the C terminus of a membrane protein. The enzyme is active if it appears on the cell surface but inactive if it is intracellular. Use of antibodies and enzymatic cleavage to determine whether certain portions of a membrane protein appear on the plasma membrane surface are also mentioned.

The book covers important interactions occurring between membrane proteins (which are mostly alpha helices in membrane spanning regions) and adjacent lipids. Also considered are interactions between the protein segments in lipid membrane which are important in determining structure. These factors contribute to the functional characteristics of large membrane proteins like the sodium channel or acetylcholine receptor.

This book would be of value to the researcher or teacher interested in the interaction of chemicals with membrane proteins. Medicinal chemists familiar with the techniques mentioned may also find this book useful.

Joseph L. Borowitz Purdue University


This book represents a sixth edition of a highly successful text first published in 1969. A new author, Dr. Allen, and a new chapter on Biotechnology and (related) Drugs have been added since the last edition in 1990. The second chapter has been redesigned to discuss in some detail the New Drug Development and (governmental) Approval Process.

The purpose of the book is to introduce the beginning pharmacy students (usually in a Pharmaceutics course) to the technology and scientific principles underlying the preparation of dosage forms and drug delivery systems and to their use in patient care.

Especially exciting in this new edition is the inclusion of 21 physical pharmacy capsules of useful information appropriately dispersed through out the 14 chapters of the book. Definitions of Selected Drug Categories and Systems and Techniques of Pharmaceutical Measurement have been retained in Appendix I and II, respectively.

As a pharmaceutics teacher, I prefer to see a division among chapters in terms of homogeneous and heterogeneous systems. A third appendix should be added in the next edition to cover pharmaceutical excipients and their functions in dosage forms design. In my opinion, Chapter 3 should be redirected away from pharmacokinetic considerations and towards the properties and stabilities of drugs and their dosage forms.

The positives however, more than outweigh the negatives. Pharmaceutical Dosage Forms and Drug Delivery Systems continues to please its readership with its breadth of content.

Robert A. Nash St. John’s University


Molecular Mechanisms of Drug Action is a book that focuses on biochemical mechanisms by which drugs exert physiological effects. The drugs covered are classified by the targets with which they interact rather than by the more common system of disease states and therapeutic uses. Thus, the book has a primary focus on biochemical pharmacology.

The introductory chapter covers basic principles relative to enzyme inhibition and receptor binding by drugs. The remaining chapters deal with drugs that modulate biochemical pathways. The major topics covered include nucleic acid biosynthesis and catabolism, protein synthesis, carbohydrate metabolism, cell wall biosynthesis, steroid biosynthesis and action, prostaglandin and leukotriene biosynthesis and action, zinc metalloenzymes, neurotransmitter action and metabolism, membrane-active agents (ion channels, sterols), microtubule assembly, and hormonal modulators. Each chapter begins with a short review of the appropriate biochemical principles and pathways. Subsequent sections describe how particular drugs exert their physiological effects through interaction with a target in the pathway. The choice of drugs covered is made relative to whether their biochemical actions provide interesting examples of mechanisms. Thus, some very important therapeutic agents are not covered and some relatively uncommon ones are. Study questions are provided at the end of each chapter.

As I began reading the book, I found myself rapidly skipping over those chapters that covered material with which I am familiar. Then I came to chapters containing material with which I was not familiar. I enjoyed reading these chapters with real intent. For example, although I have taught pharmacology for several years and understand the therapeutic uses of ACE inhibitors and the physiologic effects that account for these uses, I was ignorant of the details of the interactions between the drugs and the angiotensin converting enzyme. The exposition of these details and the explanation of the rationale behind the development of the drugs was most interesting.

I feel this is an excellent book for teaching mechanisms of drug action to graduate students I like the large number of specific examples of different mechanisms. The summaries of biochemical principles and pathways are excellent. The tables that link drugs with particular targets are very useful sources of information. In my opinion, the most important use of this book will be as a text, followed by use as a reference for those interested in biochemical pharmacology.

Lane J. Wallace The Ohio State University

*Immunoochemistry* is a bold, ambitious endeavor to cover all aspects of a very important and rapidly growing scientific discipline. Considering the breadth of this text together with the depth of discussion of each topic, a wide array of scientists should be attracted to and find interest in this reading. The authors (editors) assembled a writing team of 60 scholars from around the world with each writing a detailed description of their scientific research specialty area.

The book is divided into four sections. The first section, entitled *Immunoglobulins and Other Recognition Molecules*, contains eleven chapters. The first chapter provides an excellent description of immunoglobulin structure and function. Following this introduction, the remaining chapters of the section present detailed accounts of the chemical and physicochemical aspects of a variety of immunoglobulins and related receptor molecules. Of particular interest to this reviewer were the chapters on monoclonal antibodies, T-cell receptors, enzymatic action of immunoglobulins, Fc receptors, and lectins.

Eleven chapters addressing the immunoochemistry of antigens and haptenes are presented in the second section. Detailed descriptions of all major groups of complete antigens as well as haptenes are presented here. The coverage of the immunoochemistry of viral antigens, vaccines, and allergens were particularly interesting to this reader.

After a rigorous development of the immunoochemical properties of antibodies and antigens in the first two sections, Section III discusses the natural sequel of antigen-antibody interactions. Actually, Section III is divided into three subsections that deal first with fundamental concepts followed by in vitro and in vivo interactions. The third subsection is quite lengthy but provides a very good immunoochemical discussion of classical in vitro interactions such as precipitation and agglutination as well as the important and well-established immunoochemical methodologies. The chapters concerning immunoelectron microscopy and biosensor techniques attracted the attention of this reviewer.

The concluding fourth section is composed of four chapters that provide excellent descriptions of immune response regulation. Of particular value were the up-to-date descriptions of T-cell-mediated lymphokines and macrophage-derived cytokines. The chapter concerning the chemistry of immunosuppressants should be of value and interest to pharmaceutical scientists.

My overall impression is that this text provides a comprehensive, detailed description of a constantly expanding area of scientific research. Because of its comprehensive nature, the book should provide excellent descriptions of immune response regulation. Of particular value were the up-to-date descriptions of T-cell-mediated lymphokines and macrophage-derived cytokines. The chapter concerning the chemistry of immunosuppressants should be of value and interest to pharmaceutical scientists.

My overall impression is that this text provides a comprehensive, detailed description of a constantly expanding area of scientific research. Because of its comprehensive nature, the book should benefit a wide variety of basic scientists who desire acquisition of a more fundamental insight into the molecular mechanisms underlying immunological phenomena. Additionally, physicians, clinicians, and chemical laboratory directors and technicians may desire to read parts of this treatise because of their increasing dependence on immunoochemical tools that are used in all fields of biology and medicine. In most chapters, the presentation was thorough and quite good. This book would have been outstanding if the frequency and quality of the illustrations had received more attention. The inclusion of this text in health science libraries is highly recommended. Scientists involved with the various aspects of immunoochemical research will probably want to add this book to their personal collection for use by their research group. This treatise is too advanced and costly for classroom use.

William J. Keller
Northeast Louisiana University


*Alcohol and Hormones* is Volume 6 in the series entitled *Drug & Alcohol Abuse Reviews*, other volumes of which include *Drug and Alcohol Abuse Prevention*, *Liver Pathology and Alcohol*, *Alcohol Abuse Treatment*, and *Alcohol, Cocaine, and Accidents*. Watson has also edited a series entitled *Biochemistry and Physiology of Substance Abuse*, published by CRC Press. Although some similar material has been touched on, the series are not duplicates. Very advantageously, both series provide complete article/chapter titles for all references cited. The CRC series, however, gives the reader a better perspective concerning the contributors; advanced degree(s) and position(s) are indicated, as well as university or other affiliation, whereas in the Humana Press series, affiliations, only, are listed.

The title did not prepare this reviewer for the marked diversity among the 18 chapters. Chapters 1 and 3, respectively, involve ethanol’s effects on testicular development in mice and rats, and on the timing of various pubertal events in female rats. Studies investigating ethanol’s effects on gonadotropins, prolactin, and growth hormone in male rodents have been summarized in Chapter 5, and others involving its effects on reproductive system hormones in women and in non-human primates, in Chapter 14. Chapters 6 and 8, respectively, concern clinical studies involving Thyrotropin-Releasing Hormone, and Trp analogue, on alcohol intake of alcohol-prefering rats.

A chapter by G. Duester, entitled “Human Liver Alcohol Dehydrogenase Gene Expression: Retinoic Acid Homeostasis and Fetal Alcohol Syndrome,” had appeared in Volume 2 (1991) of this series. His chapter, “Involvement of Alcohol-Metabolizing Enzymes in Retinoic Acid Synthesis and Inhibition by Ethanol” (Chapter 4 of the present volume), includes 24 citations from 1992-1994 that report his work or that of others.

Chapter 9 summarizes studies involving “Gene Structure and Multiple Regulations of the Ethanol-Inducible Cytochrome P450(2E1...Subfamily);” hormone-related observations are included. Chapter 13, “Effect of Ethanol on Tyrosyl Phosphorylation of Growth Factor Receptor Substrates in the Liver,” concerns primarily, insulin receptor substrate 1. Curiously, about nine of the 12 pages of text, including figures and a table, lack reference citations; nevertheless, parts do appear to have been extracted from reference 6, co-authored by two of the chapter’s three authors. Chapter 18 summarizes studies concerned with the “Effect of Alcohol on Growth Hormone-Related Liver Function and Sex Hormone Homeostasis.” Chapters 2 and 16, respectively, involve “Opioid-Mediated Control of Neuropeptide Y...Peptide” and “Neuroendocrine Action of Opioid Peptides on Hypothalamic Neurons.” The authors of Chapter 2 also co-authored Chapter 15. “Alcohol, Opioids, and Testicular Function.” Chapter 10 is an informative review of “Thermoregulation and Alcohol,” and Chapter 11 summarizes studies involving attempts to elucidate the mechanism(s) of ethanol’s inhibition of vasopressin and oxytocin release from the neurohypophysis.

Chapters 12 and 17, respectively, summarize studies concerning alcohol-stress interactions in laboratory animals and in humans, and studies concerning “Interactions of Alcohol and Prostaglandins.” It would be advisable, however, for readers interested in these topics to seek out the original references.

The most disappointing chapter had the intriguing title, “Hidden Hormones in Alcoholic Beverages: Phytoestrogens.” Among old references cited as having reported the presence of estrogenically-active constituents in plants, is No. 21, which actually had reported the absence of estrogenic activity in the various concentrations of a number of different hops samples studied. The major basis for this chapter’s title would seem to be the 10 relatively current references of two of its three co-authors, which include a dissertation, and two abstracts (Refs. 44 and 47), one of the latter having appeared on p. 87A, not p. 1934, of the volume cited.

Considering topic diversity, as well as confusing errors found in several chapters, this reviewer can recommend purchase of this book only by health sciences reference libraries, for possible use by researchers as a source of ideas for future research and for the
Annual Reviews Inc. publishes reviews in more than 25 specialties and I am happy to say that the 18th volume in this series meets the standards that scientists have come to expect from these publishers. The book contains 20 diverse, relatively short reviews (the longest is 40 pages) that present enough depth to provide explanations of state-of-the-art neuroscience. The scope ranges from behavioral studies to the molecular biology of gene products. For the purposes of this review, I have arbitrarily divided them as to my interpretation of where the major emphasis lies.

Four chapters emphasize behavior. Ciaramello and Ciaramello cover the neurobiology of autism focusing on behavior but also summarizing genetic and neurochemical correlates. Weinberger describes behavioral plasticity related to the sensory cortex and duLac. Raymond, Sejnowski and Lister discuss learning and memory in the vestibulo-ocular reflex. Desimone and Duncan review mechanisms of visual attention. While these chapters are interesting to neuroscientists they do not discuss drugs.

Five chapters are more focused on organs associated with neuroscience. Knudsen and Brainard review representations of visual and auditory space in the brain. I found this article to be particularly good for individuals not expert in the area. An unusual chapter on neuromorphic analogue of very large-scale integration is not really directed at the organ level, but is a discussion of computational phenomena. It provides a bridge to understanding brain function. A historical review by Zola-Morgan describes the contributions of Franz Joseph Gall to localization of brain function. This chapter repudiates the notion that Gall was a founder of phrenology. Flatten and Heinz review developmental aspects of the cerebellum and detail functions of this organ that are not well appreciated. Singer and Gray discuss the evidence in support of a hypothesis concerning visual integration and temporal correlation. Again, these chapters do not present data related to drugs.

Gage, Ray and Fisher review current views on neuron stem cells as related to the ability or lack of ability of neuron regeneration. A critical article by Linden and Connor describes advances in learning related to long-term synaptic depression. The involvement of the floor plate in axon guidance is considered by Colamarino and Gray. Critical article by Linden and Connor describes advances in learning related to long-term synaptic depression. The involvement of the floor plate in axon guidance is considered by Colamarino and Gray. Kiernan and Gray discuss the evidence in support of a hypothesis concerning visual integration and temporal correlation. Again, these chapters do not present data related to drugs.

Three chapters are concerned with molecular events in the nervous system and are pertinent to pharmacologists. Ranganathan, Malicki and Zuker review transduction mechanisms involved in Drosophila photoreceptors. They compare these systems to mammalian transduction mechanisms. Neurotrophic influences of agrin are summarized by Bowie and Fallon. The chapter that I felt most relevant to pharmacy and pharmacology was Self and Nestler’s review of molecular mechanisms of addiction. They present theories of addiction at the molecular level and how addictive drugs satisfy or fail to satisfy the criteria for these theories.

Five chapters describe the molecular biology of genetics and neuroscience. Soriano has a relatively superficial and uncritical chapter on gene targeting in embryonic stem cells. Suter and Snipes review the molecular biology of a limited number of hereditary motor and sensory neuropathies. I found this chapter, which relates how a gene defect produces a disease, to be useful although there was little information on therapeutics. Warren and Ashley discuss triple repeat expansion mutation, such as the fragile X syndrome. Bothwell discusses trophic factors at the molecular biology level and is somewhat complementary to the Bowie and Fallon review. Takahashi reviews advances in the genetics of circadian rhythms. It is becoming increasingly evident that rhythms are important in drug actions, but he does not consider this aspect in his discussion.

This book, as with most Annual Reviews, is a bargain. There are good reviews to help neuroscientists keep abreast of recent advances. Because of its specialization, it will be of little use to scientists not in the neural fields and will be of little use to pharmacy students and pharmacists. For those teaching the pharmacology and therapeutics of drugs affecting the nervous system the book will serve as a supplement to standard texts.

Jeanne A. Skau
University of Cincinnati


In the past decade, there has been a plethora of articles, chapters, and books addressing drug therapy in the elderly. Most of these publications have addressed the aging process, pharmacokinetics of drugs in the elderly, and drug therapy of common chronic diseases commonly seen in elderly patients. In many cases, however, the texts have focused on adverse effects of drugs in the elderly rather than on proper dosages of medications for therapeutic benefit in geriatric patients. Therapeutics in the Elderly rises above many of these other publications with its scope of topics, the depth in which they are covered, and its recommendations for rational drug therapy.

The book is comprised of thirty chapters, which have been divided into two primary sections: the social, psychological, and ethical aspects of aging and the medical and pharmacotherapeutic aspects of aging. Part I presents an overview of the aging process and discusses very practical approaches to addressing common concerns of the elderly, their families, and their caregivers. Part II has five chapters which address general principles of drug therapy in the elderly, adverse drug effects resulting from changes in physiologic functions, and pharmacy services that are needed by this population. The remaining nineteen chapters discuss pharmacotherapy of common diseases, primarily grouped by organ systems (e.g., cardiovascular disease, cerebrovascular disease, central nervous system disorders, cancer, bowel and urinary problems, arthritis, osteoporosis, endocrine problems, dermatologic problems). Some rather unique topics discussed include immunosenescence, nutritional considerations, and oral health.

Generally the chapters were concise and well-written. It was particularly refreshing to read a geriatrics text which emphasized a comprehensive view of the three basic health care needs of the elderly, i.e., information on disease, wellness, and social/emotional needs. Kudos go to Chapters 7, 8, and 3, which focused on medical approaches to the elderly, long-term-care facilities, and communicating with the elderly. Some drug therapy protocols have changed since the book was written, but that is to be expected with any drug textbook. Occasionally an entire chapter discussed drug therapy in reference to a small subset of the elderly population, e.g., the institutionalized elderly. It would have been better for the author to state that the medical problem being addressed occurred primarily in this subset of the elderly so that the reader could have put the medical condition and its treatment into proper perspective.

Therapeutics in the Elderly would be particularly useful to students of all health care disciplines and to those health care practitioners whose practice has a primary focus on geriatric patients. Moreover, since this book combines scientific principles, theories, and practical considerations in providing care to elderly patients, it should be required reading for those pursuing pharmacy practice or geriatric specialty residencies.

George E. Francisco
University of Georgia College of Pharmacy

The Medical Interview, edited by Lipkin, Putnam, and Lazare, is a substantial work, planned and nurtured by the American Academy on Physician and Patient to represent the definitive text on patient interviewing. I am pleased to say that it has fulfilled its mission in the most admirable fashion. Primarily intended for physicians, this book nonetheless contains information, advice, and insights that would be invaluable to any pharmacist interested in practicing and teaching pharmaceutical care at its highest level.

The book is a collection of almost 50 articles, all prepared for this volume and carefully edited and organized. Rather than dealing with anecdotal evidence or simply relying on the advice and insights of seasoned clinicians, this book brings together the wide range of research and scholarship that has blossomed over the past 25 years in the area of health care communications. Its authors demonstrate and affirm what both medicine and pharmacy have slowly but surely come to learn; that the accomplished practitioner must deal with a whole person rather than a biological unit, that every encounter with the patient is a therapeutic opportunity and not just a problem-solving session.

Recognizing that a book of this length is not a likely cover-to-cover read, the editors have organized the book in ways so that clinicians, researchers, and educators can easily identify those sections of greatest relevance to them. Parts I and II approach the topics generally and from a number of perspectives. In particular, Lazare, Putnam, and Lipkin provide a framework for much of the rest of the book in their initial article. They discuss the interview in terms of its three functions: determining and/or monitoring the problem; establishing and maintaining the therapeutic relationship; and patient education and implementation of the treatment plan. Noting that the importance of each function may vary as a function of the type of interview, there is plenty room here for pharmacists to relate these to their particular perspectives and interests. The article by Dye and DiMatteo in Section II on enhancing patient cooperation, with treatment regimens will also be of particular interest to pharmacists. Although one can complain that the role of the pharmacist in enhancing patient cooperation is not even given passing mention, the article is still a useful and brief review of the ways in which the active involvement and participation of the patient can be encouraged and utilized.

While the first two sections are general. Part IV goes the opposite route, covering specific interviewing situations. Patient groups addressed include pediatric and geriatric populations, psychotic and suicidal patients, and alcoholic and terminal patients. There is also a chapter by Hallowfield and Lipkin on a topic that is often overlooked, the delivery of bad news. These chapters will disappoint the reader who is looking for a simple set of how-to instructions, but to the credit of the editors as much as the authors, the papers in this section uniformly present a nice blend of overview, theory, and practical recommendations.

True to the goal of the book to present the medical interview within a broad perspective, Parts III and V discuss the context of the interview and review ethical and legal issues associated with the interviewing process. Johnson, Hardt, and Kleinman do a first-rate job of discussing theoretical foundations as well as clinical strategies for conducting culturally sensitive interviews, as does Sprague-Jones in addressing gender issues. In addition Arnold, Forrow, and Barker successfully combine the fields of medical ethics and communication, a topic that has aroused growing interest within the field of pharmacy.

Part VI will prove to be of greatest interest to those involved in teaching health communications. Of particular interest are two articles on the use of standardized or simulated patients (by Hoppe and teaching via role playing (by Cohen-Cole, Bird, and Mance), as well as an article in the Appendix on the use of audio and video tape recording for instructional purposes. Covering all the bases (as this book seems to have a knack for doing), there is even a paper on the evaluation of a faculty development course on medical interviewing (by Gordon and Rost).

The final section of the book, focused specifically on research on the medical interview, contains a who’s who lineup of authors, each covering a specific topic from nonverbal interaction to patient recall and comprehension to patient assessment of quality. For the interested researcher, this section alone would be worth the price of the book, as each of the articles contains a brief, but pointed review of the literature in the area addressed.

Speaking for anyone who has ever attempted to compile such a collection, the editors are to be applauded for either instructing the authors so well or collaborating with and editing their work so carefully. It is unusual to find such a large set of papers written at the same level of sophistication, with just the right amount of cross-referencing and overlap, and of such uniformly high quality. My only complaint is that some of the articles are almost too brief, such that the interested reader would probably want more upon completing the paper. But then again, perhaps that was the editors’ intention, as clearly they seem to have considered this and made just the right compromises between breadth and depth. Should we be upset that there is so little reference to pharmacy? Perhaps, but then again maybe we should ask whether the “fault” is ours or theirs. Perhaps we should simply acknowledge this book as the major accomplishment that it is, and aim toward the goal of having a pharmacy literature on interviewing and communications that is rich enough to deserve such a large and high quality volume as this.

Edward Krupat
Massachusetts College of Pharmacy and Allied Health Sciences


Introduction to Toxicology, as the title suggests, is intended as an introductory level text for the science of toxicology. The coverage of the field of toxicology presented in this book is broad based rather than specialized as is the case with many toxicology texts. It covers important topics that are not covered by other well known toxicology texts. The material is well organized and the author has an easy-to-read style that I found to be a very important positive feature. The main drawback of the text is that the coverage of most of the material tends to be rather superficial. For a text intended as an elementary, introductory level text in the subject this is a serious deficiency. The text requires the reader to make lots of associations and to supply extensive background knowledge from related subjects such as chemistry and physiology. If the student has this background knowledge, or if the instructor can supply it, the text can serve as a very useful introduction to toxicology. If the student does not have this background knowledge much of the material in the text is too superficial to provide any meaningful information.

Introduction to Toxicology starts out with three chapters that introduce a number of the basic concepts of toxicology, for example the dose-response relationship, routes of exposure to toxic substances, and types of responses to toxic substances. Chapters 4 through 10 cover the various classes of toxic substances such as pesticides and industrial chemicals. These chapters include descriptions of specific toxic substances often with descriptions of their toxic mechanisms. The examples given tend to represent the more exotic toxic processes while the more mundane toxic mechanisms tend to be deemphasized. Some of the information is very out-of-date. For example, the statistics quoted for deaths due to poisonings by household products were from the 1970s. The final chapter (Chapter 11) is a brief coverage of the sciences of toxicity testing and risk assessment with some indication of legislated regulatory controls.

This book is the second edition of the text by the same title originally published in 1989. The changes from the original edition are very minimal. Most, if not all, of the figures and tables are the
same as in the original edition. The author has added a discussion of one additional compound to Chapter 7, a discussion of airborne particulates to Chapter 8, and discussions of two additional compounds to Chapter 9. The author has also added a small number of questions at the end of each chapter. These represent the majority of the changes from the original edition, which is 12 pages shorter than the second edition. It is this reviewer's opinion that if a person already possesses a copy of the original edition the second edition is not sufficiently updated to justify replacing the original edition.

Introduction to Toxicology by Timbrell, can be a very valuable text for an introductory level survey course in toxicology provided that the students have sufficient backgrounds in physiology, pharmacology, chemistry and biochemistry to enable them to appreciate the significance of the material. This book would also be a valuable addition to any pharmacy school library. The price of the text is very reasonable. However, if the original edition is already available the second edition does not add significant new information to justify replacing the original edition.

John C. Matthews
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