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Book Reviews

From Genes to Genomes. Concepts and Applications to DNA Technology. Jeremy W. Dale, and Malcolm von Schantz. John Wiley & Sons, England. www.wiley.com. 2002. 360 pp. $39.95.

Genetics is a discipline that has made some of the most broadly applicable advances in the recent past. The concepts of what comprises a gene and mechanisms that regulate the expression and function of a gene have opened applications across fields, such as biology, forensics, and evolution, as well as the obvious area of genetics. Simultaneously, a multitude of straightforward techniques for the manipulation of genes has made the use of genetics a critical, probably essential, tool in almost all research laboratories. Indeed, the future application of these principles of genetics will likely be a key to understanding the human genome—now that the sequence roadmap has been charted for the first time.

Jeremy Dale and Malcolm von Schantz have written an introductory text on the general aspects and principles of genetics entitled "From Genes to Genomes. Concepts and Applications of DNA Technology." These authors have laid out a very useful introductory text that will likely be used to initially educate a whole generation of scientists who will employ recent advanced made in the field of genetics. The text is nicely laid out with information presented in later chapters building appropriately on that explained in earlier chapters. These initial chapters establish not only concepts but also very practical descriptions of techniques that have become the standard of use in research laboratories.

From Genes to Genomes presents diagrams of techniques and even demonstrations of what data obtained from these methods might look like. Each technique is introduced well and potential applications are clearly stated. I particularly liked how the authors explain each technique from a very practical perspective that makes the underlying theory not only understandable but lays a foundation for the student to visualize how these techniques might be extended into novel uses. The book has a useful index and a glossary that will be used extensively by a beginning student. I found the list of useful web sites to be a thoughtful addition. Overall, this is a text that is easy to recommend and hard not to hand to the first student that comes through your office door.

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Essentials of Medical Genomics. Stuart M. Brown. John Wiley & Sons, Hoboken, New Jersey. www.wiley.com. 2003. 274 pp. $44.95.

We've seen it in all the papers, in all our trade journals: individualized medicine is right around the corner. It will change the nature of medicine and how drugs are developed. Fact or Fantasy? Like most things, the truth lies somewhere in between. Until the last decade of the 20th century, molecular biology was an esoteric specialty of genetics or biochemistry. Today, genomics, biotechnology, molecular biology, whatever you want to call it, is a highly specialized field in its own right and most of us who were in school before the mid-1990s were probably exposed to little of it. What I remember from college genetics could probably be distilled into a shot glass (Mendel? Wasn't he the one with the pea plants?). Maybe I exaggerate a little, but the point is that many pharmaceutical scientists do not have the background to understand, yet alone converse on, genomic-related issues in drug development. For instance, what is a microarray and should your company consider using them in their next clinical trial for a new anticancer agent? Can we use microarray data as a covariate in a population pharmacokinetic analysis? In order to run, we need to first walk and what is needed is a good introduction to the history, techniques, and terms that molecular biologists use so that we may better understand this technology. Brown's book aims to do just that.

This book is divided into 11 chapters, covering (but not limited to) genomic technology, bioinformatics, genetic testing, microarrays, and the –omics: pharmacogenomics, toxicogenomics, and proteomics. Brown wrote this book (two chapters were written by other contributors) as the result of a medical genomics class, an elective for medical students, taught at New York University School of Medicine. The level of writing is not sophisticated, which is actually a plus because the material is easy to digest. The level of detail is not great and the material presented is exactly what the title says—only the essentials. Many illustrations, some in color, are presented to reinforce concepts. It is easy to see that many of the black and white illustrations were originally drawn in color and then printed in the text as black and white. The result is that some of the figure fonts are not as clear as true type fonts, but are nevertheless legible. The book also has a separate glossary containing about 150 definitions of words used throughout the book.

All in all, this book was exactly what I was looking for: a high-level overview of genomic technologies and their application. Given the level of writing and method of presentation, I was able to read the book and understand the material in a few days. For someone looking for a good place to start or who needs an executive summary of the field in a short period of time, Brown's book is highly recommended. If you are looking for a reference book or a book to support other textbooks in the area, this book is not for you.

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Viral Vectors for Gene Therapy. Methods and Protocols. Curtis A. Machida, Ed. Humana Press, Totowa, New Jersey. www.humanapress.com. 2003. 589 pp. $135.

Gene therapy was once hailed as the panacea of modern medicine. The idea of replacing a defective gene to recover an optimal metabolic state of an individual seemed like the most logical therapeutic approach possible. One could even imagine identifying defective genes before the onset of disease and a prophylactic treatment. The approach seems straightforward: 1) identify the gene to be delivered; 2) insert it into a delivery vehicle; and 3) treat the patient. The delivery vehicles typically used for gene therapy can be roughly divided into the two categories, nonviral and viral. Nonviral vehicles are commonly composed of a lipid complex containing condensed DNA (encoding the desired gene) that is fusogenic with respect to the membrane of the cell to receive the therapy. These systems have the potential to deliver very large genes but have very low efficiency and are rather nonspecific for the cell receiving the gene when administered to the whole body. Further, outcomes from nonviral gene therapy are typically transient because the delivered gene does not usually integrate into the host DNA and is diluted, or even lost, with each replication cycle of the cell. Gene therapy using viral vectors can target specific cell types and efficiently deliver small- to medium-sized genes in a manner that can result in the stable integrations and long-term benefit. In essence, these systems take advantage of the route of infection used by a particular virus and use its ability to dock with specific cellular receptors, fuse with specific cell membranes, and efficiently integrate delivered genes. A number of viral vectors have been identified, each one having its own advantages and disadvantages.

This book provides a series of methods that describe the use of many viral vectors that have been used in gene therapy protocols. Each chapter provides a useful introduction on that particular virus, plenty of helpful diagrams, and an extensive materials and methods section. Each chapter provides a step-by-step description of an experimental protocol or the preparation of some material or a method of adequately analyzing the outcome of a transfection study or some other aspect of a viral gene therapy methodology. This text would be very good for someone who can appreciate the many and varied practical aspects of performing a gene therapy study. I would certainly recommend it to anyone I knew working in the gene therapy field as a book to compare and contrast practical approaches and requirements for various viral vectors. Although this book provides a great deal of very useful information, it does not, however, provide any overall perspective on the use of viral vectors for use in gene therapy. Thus, I would not suggest this book for someone who is not currently working in the field of gene therapy and who is unfamiliar with the use of viral vectors for gene therapy. And this is where I find fault with this text. Unfortunately, after more than two decades of effort, gene therapy still offers only promise and little demonstrated clinical success. And sadly, there have been a series of recent, highly publicized, setbacks related to the safety of viral-based gene therapy approaches. These setbacks need to be put in perspective. The book lacks an introductory chapter discussing current issues and possible approaches to deal with these issues. This would have put the entire text into perspective for someone who is not already embroiled in the field and would have made the book more approachable for a larger audience.

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Gene Therapy in Lung Disease. Steven M. Albelda, Ed. (Lung Biology in Health and Disease. Volume 169). Marcel Dekker, Monticello, New York. www.dekker.com. 2002. 555 pp. $185.

As the recording studios learned, getting a team of virtuoso musicians together does not necessarily mean that they will end up playing wonderful music—except for the solos, of course. The same applies to collections of reviews in a single edited volume. There are some outstanding chapters in this book that those interested in specific aspects of gene therapy will find very useful and enjoyable to read, for example Batra *et al.* on gene therapy of lung cancer in general and Sterman specifically on mesothelioma. I was particularly impressed by a very thorough chapter by Johnson and Boucher on strategies of gene therapy of cystic fibrosis, the area where enormous effort has been expended with very little clinical success so far. The section in their chapter on Barriers to Airway Gene Transfer is a "must" for anyone who is seriously interested to develop useful gene medicines for lung disease in general, not just cystic fibrosis. And this section illustrates the unattractive aspect of the whole collection, too: the general topics of vectors, delivery methods etc. are repeated in several chapters, and the chapters that are supposed to be on general topics do get into discussions of specific disease applications, too.

Several chapters actually deal with topics that are at least one step removed from "gene therapy" such as the use of gene transfer to study the mechanisms of lung disease; to draw the musical analogy further—a nice little "solo performance" but, perhaps, not quite the genre mix for the refined listener. One more disappointment—there really is almost nothing in this book that deals with the pharmaceutical issues – the need for formulations and delivery devices that are sufficiently stable and reproducible and can be used to deliver the gene medication to the intended target efficiently and safely. Those of us who worked in this field, especially in industry, know that this can be a major challenge, transferring from a very elegant test-tube system to a human clinical trial. On balance, the book does reflect the recent "state of the art" and if you are not particularly sensitive to reading a lot of redundant text or are good at skipping it, you will rewarded with a few real gems.

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Recombinant Antibodies for Cancer Therapy. Methods and Protocols. Martin Welschof and Jürgen Krauss, Eds. (Methods in Molecular Biology. Volume 207). Humana Press, Totowa, New Jersey. www.humanapress.com. 2003. 479 pp. $135.

This volume of *Methods in Molecular Biology* provides a collection of detailed protocols on the generation of recombinant antibody molecules. The focus is on recombinant antibody technologies for cancer therapy, but the technical procedures described can be applied to all manner of antibody engineering. Commonly used monoclonal antibody techniques, such as chimerization and humanization are covered, but in a rather abbreviated manner. There are many chapters on the generation of monoclonal antibody fragments that are in preclinical and early clinical investigation. The book offers a valuable guide to scientists in the recombinant antibody field who wish to gain more detailed knowledge of new methods in antibody engineering than provided in scientific journals. The detailed protocols also provide a useful tool to molecular biologists wishing to enter the recombinant antibody arena, although the background information provided is brief. Despite the concise nature of the review articles accompanying each protocol, a more than adequate reference list is provided enabling the reader to pursue areas of interest with ease.

The presentation of information in some of the chapters is very useful. For example, in the chapter describing antibody humanization by CDR grafting, all variable domain residues important in canonical loop structures and those conserved in V_L/V_H interactions are clearly presented in table format. Unfortunately, the layout of the document, with similar protocols described independently by separate authors, results in a considerable amount of repetition, especially evident in descriptions of phage technologies. Several chapters, scattered throughout the book, explain some aspects of antibody humanization, but fail to adequately describe the steps involved in designing a humanization strategy. Ribosome display, a newer molecular biology-based antibody engineering technology is notably absent from this volume, and methods for post-translational modification and isotype switching are only briefly covered. In addition, the section covering large-scale production is small and there is no inclusion of protocols for expression of whole antibodies in mammalian cell lines, the preferred method for currently marketed anti-cancer antibody therapies. Overall the book is a helpful resource, especially for molecular biologists involved in generating antibody fragments, collecting up to date protocols in one convenient volume.

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Cancer Immune Therapy: Current and Future Strategies. Gernot Stuhler and Peter Walden, Eds. Wiley-VCH, Germany. 2002. www.wiley-vch.de. 408 pp. $135.

The first chapter of this excellent text tells the whole story. Cancer Immune Therapy is an empirical field that is in search of not one, but two Holy Grails. From a practical perspective to treat large number of patients, universal tumor antigens need to be identified (Holy Grail #1). Currently, the most promising tumor antigens have been selected on a patient-by-patient basis. And even when these selected antigens appear to provide clinical benefit, it is rare that the immune response observed in the patient reflects what was anticipated to be required for a beneficial outcome. Further, once an antigen has been selected, it must be delivered to the immune system in a manner that will overcome previous self-antigen issues, but the resulting immune response must not cause significant, or at least clinically dangerous, auto-immunity (Holy Grail #2). The problem with this second goal is that in order to break tolerance to these self-antigens, almost by definition, a state of autoimmunity is initiated. I hope that I have now adequately represented to magnitude of these challenges. They are huge. And this is probably why the best outcomes in the area of cancer immune therapy seem to be poorly understood and all too infrequent. But because the stakes are so great, the effort to continue searching for paths to these two Holy Grails is worthwhile.

Each chapter in this text provides information about some component of the immune system or a strategy to identify potential cancer antigens or explains some aspect of cancer that further clarifies why the task of immune-based correction is so challenging. The information from each of these chapters is perceived to be important for a positive, sustained patient outcome. At present, however, there is such diversity in cancers and in the immunological events associated with each particular cancer that it is still unclear what is critical and what is not for a positive clinical outcome. The authors of these chapters bring these complicated aspects into focus for the reader and keep them in a proper perspective (not overselling their importance). Besides tumor antigen selection, this text discusses tumor survival through immune evasion or suppression as well as strategies of immunization through antigen delivery to dendritic cells and the potential for various adjuvants to assist in this immunization. Finally, information is presented which looks at passive immunological methods to target and kill cancer cells. Overall, the combination of topics and the organization of chapters makes this book easy to read and highly informative. Each chapter is well referenced and the book is properly indexed. My only issue is that color plates are presented in a section separate from the chapters. Flipping back and forth between the pages of the chapter and the color figures can be somewhat of hassle and breaks the flow of chapter for the reader.

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Microbial DNA and Host Immunity. Eyal Raz, Ed. Humana Press, Totowa, New Jersey. www.humanapress.com. 2002. 408 pp. $125.

Over the years there have been a number of reported cases where cancer patients, having survived a systemic, even life-threatening, bacterial infection, have had dramatic reductions in their tumor burden. Those observations have led to

the concept that some bacterial component or components could have been involved in this antitumor response. Subsequent studies have identified several aspects of the immune response associated with bacterial infections that could explain at least some aspects of what was observed clinically. Complex mixtures of bacterial components were found to reproduce these anti-tumor effects. However, regulatory approval of a complex, poorly defined antitumor agent is extremely difficult. Thus a search to identify and characterize specific antitumor components of bacteria has been underway for several decades. One of the most promising of these components was determined to be bacterial DNA. Studies showed injected bacterial DNA could inhibit tumor growth, augment natural killer (NK) cell activity and increase the production of interferons (IFNs). NKs have been shown to seek out and kill cancer cells lacking surface major histocompatibility structures. IFNs have been shown to possess antitumor activity.

Bacterial and mammalian DNA contains the same bases (purines and pyrimidines) and base pairs (C-G and A-T). So how does the immune system discriminate one bacterial DNA from mammalian DNA to generate this anti-tumor response? This issue was recently solved. The immunostimulatory DNA prepared from bacteria contains unmethylated CpG dinucleotides within hexamer frameworks of purines and pyrimidines (e.g., 5′-GACGTC-3′). CpG sequences are much less frequent in eukaryotic DNA than in bacterial DNA. Next it was observed that antigen presentation cells (APCs) of the immune system, such as dendritic cells and macrophages, had the ability to recognize and respond to these CpG structures. The receptor involved in recognizing these CpG motifs was determined to be one of a class of receptors known as Toll-like receptors (TLR); specifically TLR-9 seemed to be important. Additionally, the intracellular signaling steps involved in TLR signaling have now been elucidated. Thus, the initial observations of anti-tumor actions of bacteria seem to have come full circle in the identification of a bacterial component and a pathway of activation by that component to explain observations made decades earlier.

Microbial DNA and Host Immunity takes off from this point to provide a series of chapters that take the reader down the path of how this field has continued to mature. Some of the chapters explain further how APCs respond to CpG structures, how these events can act to modulate APC-mediated events of innate immunity to result in the cross-priming of CD8+ cytotoxic T cells and how this results in a Th1-biased response important for vaccines. With this as a foundation, subsequent chapters address how to use this information to optimize applications of CpG motifs in anti-tumor strategies, vaccines for infectious diseases, modulation of allergic responses and the prospects for altering these events in the context of inflammation and autoimmunity. These chapters are very well written and extensively referenced. The concepts they present are timely. A chapter on the potential use of CpG motifs from a regulatory perspective is also included. There is no doubt that this book could provide a reader new to this field with a clear and accurate perspective of this field. Everything promised in the introduction chapter by the editor is wonderfully delivered in this well-organized text.

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Cytokines and Colony Stimulating Factors: Methods and Protocols. Dieter Körholz and Wieland Kiess, Eds. Humana Press, Totowa, New Jersey. www.humanapress.com. 2003. 478 pp. $125.

There are many involved (read as complicated) protocols used in the biological assessment of cells involved in immune responses and in various approaches to gene therapy. These protocols are usually developed over years in a laboratory and can only be established through significant effort of trial and error. This text has pulled together a large number of these finely tuned protocols and organized them in a series of well-documented, easy-to-follow formats. The authors have organized these into groupings of 1) detection assays for cytokines and growth factors; 2) protocols on gene therapy; 3) *ex vivo* cell expansion; 4) and maturation and differentiation of dendritic cells. At the surface, there is nothing major that seems negative about such a text. It fills a need to pass on a great deal of technical information about a broad spectrum of related and inter-related protocols. Each chapter provides a nice introduction of background information and provides detailed information for each step of the protocol being presented. Importantly, there is a good deal of additional information presented with each protocol that describes details of critical or particularly complicated steps. Indeed, the only real drawback would seem to be that a spiral bound, rather than a hard bound, book might be more convenient for practical use in the laboratory. My issues with this text stem from a practical perspective.

The assays described in this book, in almost every instance, are extremely complex. Such complex assays can be very difficult to readily transfer from one laboratory to another. Instead, collaborations are typically established where samples, rather than assays, are transferred. This issue becomes more compelling when expensive equipment such as a cell sorter or when the task of getting approval for a gene therapy protocol are involved—such equipment is not always readily accessible and hurdles associated with IACUC approval for a gene therapy protocol can be overwhelming. Although the authors to these protocols have gone to exceptional lengths to document critical reagents, such reagents always seem to be a complicating issue when establishing any new protocol. All too often there is a particular production lot of a reagent that is required to provide optimal results. In the case of the protocols in this text, some of them describe reagents obtained from European sources whereas others describe those from America—based upon the geographical location of the laboratory. Unfortunately, it is not always a simple task to get reagents generated in Europe if you are in America and visa versa.

Although I have brought up a number of, what appear to be, negative issues, I still feel this is a useful compilation of protocols. My concerns are focused on warning those who look at these protocols as something that they might transfer into their laboratory with a trivial amount of effort or time.

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Superantigen Protocols. Teresa Krakauer, Ed. (Methods in Molecular Biology. Volume 214). Humana Press, Totowa, New Jersey. www.humanapress.com. 2003. 259 pp. $89.50.

Since the dawn of time, man has been bombarded by a vast array of bacteria. The human body has developed a symbiotic relationship with some of these bacteria, e.g., assisting in the digestion of food stuffs in the digestive tract. Other bacteria have learned to establish niches for themselves on our skin or in the respiratory tract or reproductive tract. At each of these surfaces, the bacteria are constantly fighting battles. Some of these battles are fought against other bacteria—a sort of turf war. Other battles involve man's immune system. Although both man and bacteria have impressive destructive arsenals, both parties have adopted a fairly permissive attitude of co-habitation. This makes sense for humans because our immune system would be running at full speed all the time if our bodies were attempting to keep these surfaces sterile. In general, the bacteria present on these surfaces can obtain required nutrients without expending energy to produce and use destructive agents associated with aggressive infection. However, in response to certain stimuli, some bacteria do transition into a phenotype associated with aggressive infection. And here is where some particularly ingenious bacterial methods of attack (and defense) can be identified. One particularly intriguing attack strategy, and experimental methods to assess and monitor events associated with that strategy, has been described in "Superantigen Protocols".

Superantigens represent a particularly aggressive attack plan by bacteria. In essence, these agents confront critical elements of man's immune system—antigen presentation cells (APCs) and T-lymphocytes (T-cells). Normally these two cells share information through engagement of the major histocompatibility complex (MHC) class II molecules on the surface of the APC with the T-cell receptor (TCR) on the surface of the T-cell. Antigens processed inside of the APC are typically presented to the T-cell in this fashion as a means of passing critical information about bacteria that have initiated an aggressive infection strategy. Superantigens, secreted by bacteria such as *Streptococcus pyogenes*, *Staphylococcus aureus*, *Mycoplasma arthritidis*, and *Yersinia enterocolitica* bind to the TCR and MHC class II molecules to form a trimolecular complex. This association results in a potent T-cell stimulation that acts to drive a massive immune response which can result in the causation of disease (or even death) that is associated with these infective bacteria. Teleologically, this strategy by the bacterial can be attributed to issues of increasing its nutrient base and/or release from one host to provide the potential to infect other hosts.

The protocols presented in this text are more than just methods. They are a roadmap of a field that has only recently emerged. Although secreted bacterial toxic agents have been studied for decades, bacterial superantigens are a more modern immunological concept. Recent crystal structures have added tremendous information to how superantigens interact with MHC class II and TCR molecules. Increased understanding of T-cell biology and cytokine actions have provided a clearer understanding of the disease outcome(s) associated with superantigen action(s). Thus, one can envision a variety of potential methods to characterize, block or even reverse the actions of superantigens. This book presents a series of chapters that describe particular methods associated with these various aspects of understanding and/or dealing with superantigens. Each chapter provides a background, extensive methods and adequate details of data related to some aspect of studying superantigens. I particularly liked the extensive notes section of some chapters that detailed specific aspects of these protocols. Such information is frequently critical for successfully duplicating a published protocol. Overall, I found this book an excellent resource that would be extremely valuable in setting up methods to assess bacterial superantigens.

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Molecular Biology of Drug Addiction. Rafael Maldonado, Ed. Humana Press, Totowa, New Jersey. www.humanapress.com. 2003. 346 pp. $135.

Technological advances typically have a profound impact on any field in science, providing better focus and improved lighting in a world that was previously dimly lit or hazy. And from each newly illuminated point of reference or freshly focused landmark, a greater understanding in a field is achieved and new relationships and associations become discernible. By now you assume that this book review is on the subject of vision. Well, in some ways it is. Drug addiction represents such a powerful force on the human brain as to blind the addict from rationale thought or self-restraint. The root of this addiction comes from deep within the brain of the addict – a location that has been as poorly lit and unclear as the back wall of a deep, dark cave. Now, a plethora of new techniques have converged onto this field of addiction and have provided us with a powerful flashlight and a strong magnification lens that allows for the clear identification of objects at the very back of that cave.

I don't work in the area of drug addiction; nor do I work in the area of neurophysiology. But I found the *Molecular Biology of Drug Addiction* fascinating and enjoyable to read. I assume that this is because everyone seems to know the implications of addiction and are often even directly confronted in our daily lives with the issues of drug addition in some way. Thus, I found this text to be a wonderful compilation of information that helped me understand the basis for addiction of heroin, cocaine, marijuana, alcohol and nicotine. The chapters are well written and well organized. What I found very enjoyable about the book was how each chapter highlighted the use of recently established techniques to provide an improved understanding of the role of specific membrane transport pathways, hormone receptors, intracellular signaling pathways and even circulating hormone and drug levels deep within the brain. Each chapter describes the use of recently developed behavioral models, knockout mice, selective enzyme inhibitors, chemical analogues, and microdialysis techniques—with all of these methods being pointed at discerning exact pathways, specific genes and parameters that modulate drug addiction. Although the majority of the studies described have used rodents, the implications to man are perfectly clear. Maybe this is really why I enjoyed this book; because it helped me to see myself a bit more clearly.

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Hansenula polymorpha, Biology and Applications. G. Gellissen, Ed. Wiley-VCH, Germany. www.wiley-vch.de. 2002. 347 pp. $105.

The adaptability of life has been shown repeatedly by the identification of unique, sometimes, bizarre species that not only survive but also thrive in environments which humans would find most inhospitable. *Hansenula polymorpha* represents one of these amazing species: yeast capable of surviving on methanol as a food source. Herein is the basis for this book—a series of chapters written by experts on the subject of *H. polymorpha*. These chapters are nicely choreographed, beginning with excellent introductory information and building to complicated issues involving the biology and applications (as the title suggests) of *H. polymorpha*. Most importantly, potential industrial applications are presented with comparisons to other systems and stress disadvantages as well as advantages of *H. polymorpha*. (It is all too easy for someone who works extensively on such an interesting system to dwell on it without perspective.) This book presents a nice balance of current uses and realistic applications of *H. polymorpha* in a format that provides something for everyone and is clearly a very useful text for anyone working with this species.

Like many others who will see this book on a shelf or in a listing somewhere, it is doubtful that I will ever actually use *H. polymorpha* in my lab. So why read about this novel eukaryote unless one intends to study it or use it directly in some application? I started reading this book from that perspective, but finished the book with a greater appreciation for a novel yeast that, by its mere existence teaches each of us something about life in general. *H. polymorpha* can survive on methanol as a food source because it has established metabolic pathways to deal with the two extremely toxic compounds derived from the initial breakdown of methanol—formaldehyde and hydrogen peroxide. How does *H. polymorpha* keep its proteins from being covalently modified or oxidized by these noxious compounds? The answer lies in the structure and function of the intracellular organelle known as the peroxisome. As one reads through the various chapters in this book related to the biology of *H. polymorpha*, the function and organization of the peroxisome repeatedly surfaces as a theme. Thus, in many ways the study of *H. polymorpha* is the study of peroxisomes and survival under challenging conditions. Even when not confronted with methanol, the use of the promoters that drive intense expression of methanol-metabolizing enzymes can be employed in industrial settings. In reading this book I learned new lessons in adaptability and cellular organization from this text. Others not working in the specific field of *H. polymorpha* will likely acquire unexpected benefit in areas more directed at their field of study.

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Proteoglycans in Lung Disease. Hari G. Garg, Peter J. Roughley, and Charles A. Hales, Eds. (Lung Biology in Health and Disease. Volume 168). Marcel Dekker, New York, New York. www.dekker.com, 2003. 459 pp. $175.

It is remarkable that this Marcel Dekker series on lung biology now has 170 volumes - I guess the lung is the closest thing to everyone's heart, so the popularity should not be that surprising! What may be surprising for many readers is that proteoglycans with their polysaccharide chains containing glycosaminoglycan, such as hyaluronan, chondroitin sulfates and heparin, are critical components of lung structure and function. The fine balance between the synthesis and degradation of proteoglycans is disturbed in disease. This volume contains reviews of the general state of knowledge of proteoglycans in the lung and the tools to study this topic further, as well as the roles of the various lung proteoglycans in a variety of chronic and acute disease (emphysema, bronchiectasis, mesothelioma, edema, fibrosis, asthma). This is definitely a book for people who are fishing for revolutionary therapeutic interventions in lung disease: There is remarkably little known about the utility of administration of proteoglycans for the treatment of lung disease with a few exceptions such as the work of Cantor et al. on the use of hyaluronic acid in emphysema mentioned in Chapter 5 by Savani and Delisser. The opportunities to find new therapeutic targets related to proteoglycans are discussed in Chapter 17 by Xu. And since many of the glycosaminoglycans are now available in pharmaceutical grades, they could be considered as "excipients" for drug delivery to the lung. This is a "must" for anyone seriously interested in exploring new avenues to treat diseases of the respiratory tract.

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High Throughput Screening, Methods and Protocols. William P. Janzen, Ed. Humana Press, Totowa, New Jersey. www.humanapress.com. 2002. 265 pp. $99.50.

This book provides a basic overview of the scientific, engineering and business aspects of High Throughput Screening (HTS) technology. The book is roughly divided into three main topics of discussion. The first topic discusses the assays that form the basis of HTS. Several approaches are discussed and standard protocols and methods for each type of screening assay are provided. The limitations of each approach are examined and comparisons between the different screening assays are made. Helpful tips for troubleshooting are also outlined. The second topic deals with management of the HTS compound libraries and handling of the information that is generated from each screening assay. Issues such as: how to store the HTS compound libraries; what the best procedures are for preparing them rapidly and reproducibly every time that they are used in a screening assay and; how information generated from each assay is processed and archived are addressed. Finally, the last chapters deal with hardware and software issues. Consideration is given to what types of equipment and accessories have proven to be most useful in practice, the design of the programs that control the automation of the HTS screening assays, and defining algorithms for most efficient operation of HTS systems.

While informative, this book contains many typographical and grammatical errors that greatly detract from its readability.

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Protein Sequencing Protocols. Second Edition. Bryan John Smith, Ed. (Methods in Molecular Biology, Volume 211). Humana Press, Totowa, New Jersey. www.humanapress.com. 2003. 493 pp. $99.50.

"Protein Sequencing Protocols," edited by Bryan John Smith, is a compilation of a wide variety of detailed methods for characterization of proteins. The topics covered range from sample handling, protein cleavage, chemical modification, hydrolysis, amino acid analysis and protein sequencing to identification of sites of protein modification and cross-linking. Included are sections on gel electrophoresis, HPLC, mass spectrometry and other instruments necessary for protein analysis. Each chapter is subdivided into formal sections of Introduction, Materials, Methods, Notes, and References, with additional issues pertinent to each topic also discussed. A positive feature of this book is the fact that minute details, which are essential for successful implementation of an analytical method are provided. However, the presentation would be a little more user-friendly if the Materials/Methods/Notes for each protocol were grouped together rather than having all of the Materials for the different methods covered in each chapter followed by all of the Methods and then all of the Notes. It was also a bit surprising to see the focus much more on the older chemical methods for protein sequencing instead of using mass spectrometry for identification and characterization. As such, this book can serve as a useful reference for laboratories which mainly utilize chemical methods for protein analysis. However, it is not the best choice for investigators desiring to establish new facilities to analyze proteins as they are more likely to need more information about mass spectrometric techniques than is provided here.

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Capillary Electrophoresis of Carbohydrates. Pierre Thibault and Susumu Honda, Eds., Humana Press, Totowa, New Jersey. www.humanapress.com. 2003. 318 pp. $99.50.

Capillary electrophoresis is a technique that has come of age, and this book is timely in bringing together a wide variety of published and unpublished methodologies and their applications to carbohydrates over a diverse area ranging from mammalian glycoconjugates to bacterial glycolipids.

The book is firmly aimed at researchers with a fair knowledge of carbohydrate chemistry and biochemistry, and on the whole deals with sophisticated techniques employing the top end of the range of commercially available instruments. It describes basic procedures of monosaccharide and simple homo-oligosaccharide analysis, and also gives examples of the applications of capillary electrophoresis, affinity electrophoresis and isoelectric focussing to the analysis of complex branched oligosaccharides derived from glycoproteins and bacterial lipopolysaccharides. There are also useful accounts of the application of the techniques to the separation of intact glycoproteins and to the assay of glycosyl transferases and carbohydrate-protein interactions. Introductory chapters on sugar derivatization and on the derivation of oligosaccharides from glycoproteins and glycoconjugates are very useful, and have applicability to many other areas of carbohydrate analysis.

As seems customary nowadays, the book starts with some general background. While this material is adequate in itself, it is not likely to target the same audience as the highly sophisticated technical material. Similarly, an Appendix on structures of animal and bacterial carbohydrates (why not plants and eukaryotic microbes?), while interesting, inevitably lacks the detail and comprehensiveness that would be required by researchers employing many of the techniques described. Moreover, the Appendix contains typographical errors and inaccuracies.

Unfortunately, while the aim of the book is to provide complete and practical laboratory protocols, its value as a day-to-day laboratory guide is marred by excessive formalization that leads to interdependent protocols appearing far apart, linked by complex cross-referencing that is at times quite difficult to follow. For example, for the complete protocol for the valuable PMP derivatisation method, the user is referred to a list of materials, each with a reference to a further note, a derivatisation procedure, each stage of which has a reference to further notes, and the notes themselves, which in turn have further cross-references.

Despite some faults, however, the book will be very valuable for researchers carrying out carbohydrate research, or planning to do so, and contemplating the best analytical approaches. At $99.50 it is a book for libraries and specialists, but they will want to have it.

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Categorical Data Analysis. Second Edition. Alan Agresti. John Wiley & Sons, New York, New York. www.wiley.com. 2002. 710 pp. $89.95.

This second edition is very extensive compared to the three previous books by Prof. Agresti: *Categorical Data Analysis (First Edition)* published in 1990; *An Introduction to Categorical Data Analysis*, a technically lower level text book published in 1996 (Wiley); and *Analysis of Ordinal Categorical Data*, a text book consisting of methods for variables having ordered categories. Compared to these previously published books, this current book contains plethora of technical

details behind methodologies used in analyzing categorical data. Overall, it is a total delight reading this book, which in my opinion, should be considered as the current standard textbook for teaching analysis of categorical data.

This second edition includes 16 chapters compared to the 13 chapters included in the first edition. One of the additions is a chapter on historical developments of the categorical analysis/methods (Chapter 16), which will be discussed further below. As indicated by the author, the contents of the first seven chapters (Chapters 1-7) are typically required for any graduate level course in categorical data analysis. Chapter 1 is new in this edition, and it includes distributions (binomial, multinomial and Poisson) that are used in describing categorical (discrete) variables. In addition, the author has added technical details needed to draw statistical inference about the parameters. Naturally, this chapter sets the stage for rest of the book as for as the technical contents are concerned.

Chapters 2 and 3 describe models and traditional methods used in basic two-way contingency tables. After describing relationships between variables and the underlying parameters, there are additional discussions on *odds ratio* and stratified two-way tables in Chapter 2. Inferential procedures including confidence intervals for measures of association for two-way tables (e.g., odds ratio) are presented in Chapter 3. In addition to chi-squared tests of hypothesis of independence, this chapter also covers discussions on both large sample and small sample methods.

A family of generalized linear models (GLM) can be formulated to describe the effects of several explanatory variables (both continuous as well as categorical) on a set of response variables. Chapter 4 deals with the theory of generalized linear models, which extend ordinary regression models to include responses, which are not normally distributed. These models are also useful in modeling functions of the mean. In this chapter, the author considers both binary and count data and their distributional properties. Model fitting and inference issues based on these models are discussed in detail. This chapter could easily be skipped by those readers who are more applied without losing continuity of the details.

Chapters 5 and 6 deal with logistic regression models, which help to write the relationship between a binary response variable Y and an explanatory variable X as:

$$\pi(x) = \exp(\alpha + \beta x)/[1 + \exp(\alpha + \beta x)],$$
$$\text{where } P(Y = 1 \mid X = x) = 1 - P(Y = 0 \mid X = x).$$

As a result, the log odds (or *logit*) can be written in terms of a linear relationship, $logit[\pi(x)] = \alpha + \beta x$. Methods and inferential procedures for a logistic regression are developed in Chapter 5, whereas, Chapter 6 deals with model selection and related applications for logistic regression models based on the basic concepts developed in Chapter 5. With several explanatory variables (e.g., baseline characteristics of subjects in clinical trials) that may potentially result in many models, this chapter discusses strategies for choosing the correct model(s). It also addresses methods for goodness of fit of the model, diagnostics for model checking and sample size calculations for logistic regression.

Chapter 7 extends the concepts developed in Chapters 5 and 6 for binary response variables to multicategory response variables using multinomial generalized linear models. The author develops generalizations of logistic regression to multinomial variables that are both nominal and ordinal. Inference procedures are derived through extending Cochran-Mantel-Haenszel statistic to include multinomial responses. Loglinear models are introduced in Chapters 8 and 9. These models are useful in studying associations and interaction patterns among the response variables via generalized linear models with log link function. In Chapter 8, the author discusses methodologies for two-way, three-way and multiway contingency tables. Model selection, diagnostics for model checking and loglinear models for ordinal variables are presented in Chapter 9.

In clinical trials, measurements from subjects are taken over a period of time, which are commonly known as *longitudinal studies*. If an observation from one sample (e.g., treatment) is paired with an observation from another sample (e.g., control), then the underlying data is known as *matched-pairs.* Chapter 10 discusses logistic regression models for *matched-pairs* data. A special case of two-way contingency tables, known as *square* tables, involving *matched-pairs* occurs when a same number of rows and columns summarize the data. The latter part of Chapter 10 includes loglinear models for *square* tables and other related topics. These methods are further generalized in Chapter 11 to include explanatory variables. Several theoretical details regarding maximum likelihood and quasi-likelihood methods for fitting marginal models are also discussed in this chapter. One of the highlights of Chapter 11 is a comprehensive discussion on *generalized estimating equations* (GEE), which are multivariate versions of quasi-likelihood approaches but simpler than maximum likelihood computationally.

Methods for analyzing clustered categorical data that include random effects involve a major area of current research in statistics. The author provides an extension of generalized linear models, known as *generalized linear mixed models* (GLMM), to include random effects in Chapter 12. As a special case of this extension, logistic-normal models are also discussed in this chapter. Additional models (e.g., latent class models), which use nonnormal mixture distributions, are elaborated in Chapter 13. Finally, Chapters 14 and 15 elaborate on the theoretical foundations for analyzing categorical data, including alternatives to the maximum likelihood paradigm, which are sprinkled throughout this book. Above all, Chapter 16, which sketches the history of categorical data analyses, is an excellent conclusion to this classic book.

As indicated by the author in his preface to this edition, the extensive material on more than 100 'real' data sets, numerous exercises at the end of every chapter, appendix that includes SAS codes used for analyzing various data sets and a current set of references are the highlights of this book. In my opinion, these sections should make every applied statistician very happy and complete. In addition, this book should also be considered as a textbook for graduate studies as well as a good reference to other statisticians who practice these methods in their professions.

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Drug Safety Evaluation. Shayne C. Gad. John Wiley & Sons, New York, New York. www.wiley.com. 2002. 1007 pp. $150.00.

This book provides excellent treatise on drug safety evaluation from discovery to post marketing surveillance. An extensive discussion on international regulatory requirements, introduction to the rationale for safety testing, safety test protocols, formulation factors affecting safety, and *in vitro* and *in vivo* models enables the reader to become familiar with a diverse set of safety issues. The author has managed to bring together an excellent compilation on drug safety evaluation practices from his years of experience in a multidisciplinary environment. It often happens that pharmaceutical scientists and investigators, especially those with only a few years of experience, work in specialized fields and do not possess the breadth of knowledge about the safety evaluation process from discovery to clinical evaluation to marketing. This book will be extremely helpful to scientists working primarily in the pharmaceutical industry to become familiar with the broad issues involving drug safety. The author has included relevant and up-to-date information on all topics and should be complimented for also including a chapter on the sources of literature references as this is the first and a very important step in the safety evaluation process. The organization of the book is excellent starting with broad aspects such as regulatory requirements and then slowly getting into the nitty-gritty of test requirements.

The book starts with a broad overview of the drug discovery process in Chapter 1 describing the role of safety evaluation at each step of the development process, regulatory requirements, project management, screens and their use in safety assessment, and scheduling and sequencing the toxicological studies. Chapter 2 guides the reader through the U.S. Regulations (Code of Federal Regulations) on pharmaceuticals with particular attention to safety and efficacy and compares the U.S. requirements with those of International Committee on Harmonization, Japan and European Union. In this chapter testing guidelines for conducting toxicity studies for traditional pharmaceuticals, products derived from biotechnology, cellular and gene therapeutics and oral contraceptives are covered in great detail. One of the first tasks that need to be carried out in research is literature review. But often the question arises "where to search." Chapter 3 provides an excellent overview of the information sources available for safety assessment.

Chapter 4 encompasses an in-depth coverage of screens in safety and hazard assessment and introduces the reader to the concept of drug candidate selection on the basis of screening tests. Screen characteristics, types/designs of screens, use of screens, and analysis of screening data are covered in this chapter. In Chapter 5 acute toxicity studies are covered in great length. The author discusses the advantages and disadvantages of various dose level determination techniques/methods, systemic toxicity characterization, design of acute toxicity tests (minimal acute, complete acute and supplemented acute toxicity tests), acute toxicity testing using nonrodent species, factors that may affect acute toxicity test results and general and specific toxicity screens among others. The topics are covered in depth and in a lucid manner covering both practical and theoretical aspects. This chapter also incorporates current regulatory requirements.

Chapter 6 deals with genotoxicity and begins with an introduction to cytogenetic changes, causes and consequences. The author then goes on to provide a comprehensive description of the testing systems (both *in vitro* and *in vivo*) that are commonly employed to test mutagenic properties of chemicals. In the next three chapters (7, 8 & 9) the author provides an excellent up-to-date and comprehensive description of subchronic, chronic, developmental and reproductive toxicity and carcinogenicity testing. He covers, among other topics, study design, routes of administration, dose selection, species, strain and model selection, parameters to be measured, timing of studies, duration of studies, diet, developmental signs and behavioral tests, associations between developmental and maternal toxicity, assessment of human risk, statistical analysis and data interpretation.

Chapters 10 and 11 deal with safety assessment of inhalant drugs, dermal, ocular and other non-parenteral irritation tests, parenteral (bolus and infusion) irritation/tolerance, phototoxicity/photosensitization and pyrogenicity. Again the author does a thorough job of providing detailed information on the various physiological factors that come into play, methods for safety assessment/screening procedure, parameters of toxicity evaluation, dose/exposure concentration determination, exposure techniques, factors affecting outcome, potential problems and their resolution. Chapter 12 focuses on the safety assessment of biotechnology products and the specific safety issues associated with these compounds, screening models and planning safety evaluation program for such pharmaceuticals. In the next chapter (Chapter 13) the author presents an overview of dosage forms, routes of administration, factors affecting absorption and the choice of dosage form. The author further elaborates upon dose calculations and regulatory issues in the use of pharmaceutical excipients with respect to toxicity/safety issues.

In chapter 14 the author touches upon occupational toxicity with an overview on the requirements by international regulatory authorities. He also describes the role of an occupational toxicologist in the evaluation process which includes data management, evaluation and dissemination and hazard assessment. Chapter 15 presents a comprehensive analysis on the immunotoxicological evaluation of pharmaceuticals. Starting with an overview of the immune system the author discusses the immunotoxic effects, immune system suppression and stimulation, assessment of immune competency and commonly used assays to assess humoral, cell-mediated or nonspecific immune system dysfunction.

In chapter 16 various nonrodent animal models are described along with the advantages and disadvantages of each model, differences in experimental design, dosing, study protocols and statistical evaluation. The author discusses, in Chapter 17, various *in vitro* models used in toxicity evaluation, their specific application and needs for the future. Chapter 18 describes the importance of pharmacokinetics and toxicokinetics in drug safety evaluation and regulatory requirements. The author gives an overview of absorption, distribution, metabolism and elimination; the role of enzymes and changes induced in enzyme activity; analytical methods; and physiologically based pharmacokinetic modeling. In Chapter 19 the author turns his attention to safety pharmacology (effects of a potential drug that is unrelated to the desired therapeutic effect) and provides a detailed write-up on the regulatory requirements, study design, and organ system specific tests. Chapter 20 deals with the evaluation of

human tolerance and safety in clinical studies and the role of toxicologists in these studies. The author presents a comprehensive review of regulations, time frames, safety monitoring, protocol design, adverse event handling, clinical trial process, dosing, routes of administration, approach to assessing safety and safety indicators and adverse drug reaction analysis and evaluation.

Chapter 21 covers post marketing surveillance. This is an extremely important aspect the importance of which is not easily appreciated or visualized by many in the pharmaceutical field. The author does an excellent job describing the regulatory requirements, causes for withdrawal, management of adverse drug reactions and events, corrective measures and legal implications of withdrawal. In the last chapter the author presents a comprehensive review of the various statistical tools used in pharmaceutical safety assessment.

Pharmaceutical scientists working in the drug discovery field will find this book to be an excellent guide and reference source for the safety assessment of drug candidates. The author has provided excellent up-to-date information, methodologies and problem solving approaches that will help individuals responsible for safety evaluation to tackle day-to-day challenges as well as to understand the utility and regulatory requirements of such measures.

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Encyclopedia of Pharmaceutical Technology. Second Edition. James Swarbrick and James C. Boylan, Eds. Marcel Dekker, New York, New York. www.dekker.com. 2002. 3,032 pp (online version). $1,150 (for both in print and online).

Rapid advancement in drug discovery and development in recent years is effect of the explosion of technology in the field of pharmaceutical sciences. In meeting the demand for comprehensive reference work capturing such dynamic subjects of the pharmaceutical drug development and technical advances for information exchange within the field, the revised entry of the first edition of the Encyclopedia of Pharmaceutical Technology is thus decisively essential.

The second edition of the Encyclopedia features articles that have been revised from the first edition. This has been accomplished by ingression of new (co-)authors, expansion of coverage of information and renewal of references. Addition of reviews on new topics other than those covered by the first edition has widened the scope of the Encyclopedia to some extent. The quarterly-updates are necessary and valuable in capturing the dynamic changes and new discovery in the field. On the whole, articles were written by professionals in their particular areas of expertise, with approximately 49% of the articles contributed by the academics, 44% by those from the industries, and 11% by the regulatory bodies and private consultants.

The 200+ articles are arranged alphabetically by subject-title in the on-line version. Some of these titles are rather broad, however. The styles of the articles are relatively consistent. Majority of the articles contain a clear objective(s) and summary.

The flow of the body text is generally well thought-through and organized. Many articles covered both general and specifics of the topic, which makes the book suitable for both novices and professionals. Materials cited are pertinent. In some cases, readers may find the article arid with nothing but factual information. Some authors, however, have done an excellent job in compiling real case studies and examples, which really add color and vivacity to the articles (examples, but not limited to, "Medication Errors," "Peptides and Proteins—Pulmonary Absorption"). Some authors are particularly thoughtful in adding further/future reading materials, which would be of great benefit to those who are interested in learning more about the particular area (examples, but not limited to, "Generic Drugs and Generic Equivalency, Iontophoresis, Flavors and Flavor Modifiers," "Colloids and Colloid Drug Delivery System," "History of Dosage Forms and Basic Preparations"). References are relevant but mostly focus on information extracted from journal publications. Authors should not overlook the existing patents and information from the World Wide Web, which could be as, if not more, valuable and up-to-date, than that from the journals.

Being made available on-line, the second edition is user-friendlier than the previous edition. More importantly, the availability of the on-line search engines for keywords, authors and titles helps to locate and explore the required information from the Encyclopedia more efficiently and effectively.

The editors, authors and publisher are to be congratulated on the tremendous effort that has been put into the second edition of the Encyclopedia, in revising the material from the first edition and updating the book with new information from many specialties encompassed by pharmaceutical technology. It is certainly a valuable addition to the reference list for anyone working in the area of drug delivery and pharmaceutical technology. The book is highly recommended as a key reference text for both undergraduate and graduate courses in pharmaceutical sciences and drug delivery.

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Transdermal Drug Delivery. Second Edition, Revised and Expanded. Richard H. Guy and Jonathan Hadgraft, Eds. (Drugs and the Pharmaceutical Sciences, Volume 123). Marcel Dekker, New York, New York. www.dekker.com. 2003. 383 pp. $165.

The Second Edition of *Transdermal Drug Delivery*, edited by Richard H. Guy and Jonathan Hadgraft, contains a series of chapters by various contributors that address current issues relating to transdermal drug delivery. The book can be

divided into three general sections, addressing modeling of transdermal absorption and transport; enhancement of transdermal delivery; and regulatory requirements for development of a transdermal product, respectively.

The modeling section of the book consists of a chapter with a review of basic science for transdermal delivery, including diffusion equations, empirical models for predicting transport, skin structure, and other practical information for transdermal research, followed by three chapters containing an extensive database of empirical models for predicting permeation and transport of chemicals in skin. The initial chapter is a useful synopsis for those beginning work in transdermal drug delivery. The database contains information on interaction of many chemicals with skin. Some of these chemicals are drugs; however, the magnitude of this section is inconsistent with the primary topic of transdermal drug delivery.

The enhancement section contains a series of chapters that address modern methods for overcoming the barrier function of skin to achieve an adequate delivery rate of drugs by the transdermal route. The enhancement methods discussed in these chapters include iontophoresis, electroporation, sonophoresis, metabolic enhancement, supersaturation, and physical invasion. These chapters contain an informative discussion of these modern methods that is valuable for both experienced scientists and those interested in a preliminary understanding of these methods for improving transdermal delivery for cases where the capacity to deliver by standard passive means is insufficient.

The final section of the book, which discusses regulatory requirements for development of transdermal products, consists of a single chapter, which is short and direct. The chapter is informative regarding the regulatory issues specific to transdermal products. This section of the book is most useful for those experienced in the general regulatory requirements for approval of new drugs and generic products, but need additional information on those regulatory issues unique to transdermal products.

Transdermal Drug Delivery is an informative book for both scientists with experience in transdermal delivery and for those with only moderate background in this topic. The most useful section of the book is the series of chapters that discuss techniques for enhancing the rate of delivery of drugs through skin. One key issue in transdermal delivery that receives little attention in the book is topical safety of drugs and components. The book would be improved by addition of more information on this topic.

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Books Received

Biomedical Engineering

Biomechanics: Principles and Applications. Daniel J. Schneck, Joseph D. Bronzino, Eds. CRC Press, Boca Raton, Florida. www.crcpress.com. 2003. 300 pp. $99.95.

Lasers in Medicine. Ronald W. Waynant, Ed. CRC Press, Boca Raton, Florida. www.crcpress.com. 2002. 335 pp. $159.95.

Experimental Design for Combinatorial and High Throughput Materials Development. James N. Cawse, Ed., Wiley-Interscience, Hoboken, New Jersey. www.wiley.com. 2003. 317 pp. $89.95.

Pharmacology

Analgesics. From Chemistry and Pharmacology to Clinical Application. Helmut Buschmann, Thomas Christoph, Elmar Friderichs, Corinna Maul, and Bernd Sundermann, Eds. Wiley-VCH, Germany. www.wiley-vch.de. 2002. 604 pp. $185.

Dietary Supplements. Toxicology and Clinical Pharmacology. Melanie J. Cupp, and Timothy S. Trace, Eds., Humana Press, Totowa, New Jersey. www.humanapress.com. 2003. 410 pp. $99.50.

Stockley's Drug Interactions. Sixth edition. Ivan H. Stockley, Ed. Pharmaceutical Press, Grayslake, Illinois. www.pharmaceuticalpress.com. 2002. 1080 pp. $135.

Polymers

Block Copolymers. Synthetic Strategies, Physical Properties, and Applications. Nikos Hadjichristidis, Stergios Pispas, George A. Floudas. John Wiley & Sons, Hoboken, New Jersey. www.wiley.com. 2003. 419 pp. $125.00.

Radiation Technology for Polymers. Jiri George Drobny. CRC Press LLC, 2000 N.W. Corporate Blvd., Boca Raton, Florida 33431. www.crcpress.com. 2003. 206 pp. $149.95.

Conductive Electroactive Polymers. Intelligent Materials Systems. Gordon G. Wallace, Geoffrey M. Spinks, Leon A.P. Kane-Maguire, and Peter R. Teasdale, Eds. CRC Press, Boca Raton, Florida. www.crcpress.com. 2003. 237 pp. $ 189.95.

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