

Book reviews

Drugs of natural origin – a textbook of pharmacognosy, Gunnar Samuelsson, 4th revised edition, 551 pages, Apotekansocieteten, Swedish Pharmaceutical Press, Stockholm, 1999, (ISBN: 91-8627-481-3)

The third edition of this book was published in 1992 but in the interval great progress has been made in the biosynthesis of natural products and in enzymology. This newly revised textbook provides a comprehensive summary of the continuously expanding knowledge concerning biosynthetic processes occurring in plants.

The book is divided into 13 chapters. The Introduction (Chapter 1), gives definitions of what a natural product and a crude drug are and presents a brief history of natural products used in ancient and modern medicine. The role of ethnology and pharmacognosy in drug discovery is also briefly reminded. Chapter 2 offers basic knowledge relating to the production of crude drugs. This includes cultivation of medicinal plants, quality control of crude drugs, preparation of extracts and isolation of pure compounds.

The scientific community is increasingly aware of the importance of in vitro tissue culture. The development of biotechnology and the potential of genetically transformed cells, offer a chance to accelerate the process of plant improvement. Chapter 3 gives a brief overview of the different techniques used for in vitro production of plant-derived metabolites. Chapter 4 is of fundamental importance: it deals with the photosynthetic process related to the formation of pharmacologically active compounds in plants. Chapter 5 presents the production of important medicinal carbohydrates and their isolation from plant material. Economically important derivatives such as honey, sucrose, starch, dextran, cellulose, heparin, gums and mucilages are discussed. The following chapter covers the shikimic acid pathway and the natural products which derive from it. After a brief introduction on the localization of the shikimic acid pathway in plants and on the enzymes involved, a concise review deals with gallic acid and tannins. The remainder of the chapter offers a concise account of the aromatic amino acids phenylalanine, tyrosine and tryptophan which are important intermediates in the biosynthesis of many secondary metabolites such as alkaloids, phenols, hydroxycinnamic acids, phenylpropanes, xanthenes and others. The importance of acetate as starting material for the biosynthesis of many natural products is underlined in Chapter 7. The covered range of secondary metabolites is considerable

and a clear explanation is given of the two main routes originating from acetate, i.e. the acylpolymalonate pathway and the isopentenyl diphosphate pathway. Numerous classes of compounds are described and, for each class, a representative number of drugs are presented. Chapter 8 briefly describes some important amino acids. They are grouped into ‘families’ on the basis of the carbon skeleton to which the amino function is attached: α -ketoglutaric acid group, pyruvic acid group, oxalacetic acid group, serine group, histidine, aromatic amino acids and essential amino acids. Chapter 9, entitled ‘Natural products derived biosynthetically from amino acids’, deals with enzymes isolated from plants and with toxicologically interesting proteins and peptides, lectins and snake venoms. This chapter also covers glycopeptide and β -lactams antibiotics. Alkaloids are presented in Chapter 10. Because these secondary metabolites compose such a diverse group of chemical constituents, they are generally classified according to their biogenetic origin. But this is not the method used in this book. Here, they are classified according to the ring systems that constitute the main part of their structure. This classification, however, brings about confusion and is not very informative. For example, how is it possible to group ibotenic acid and colchicine in the same group? The two remaining chapters focus on purine derivatives (Chapter 12) and allergy and allergens (Chapter 13).

This new edition of ‘Drugs of Natural Origin’ is a well-written textbook which provides the latest information in a clear and accessible style. Furthermore, chapters 6–11 are advantageously completed by coloured pictures showing some important medicinal plants. On the whole, this book reaches a high standard of presentation and can be recommended not only to undergraduate and graduate students in plant biology or pharmacy but also to scientists interested in phytochemistry.

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Submicron Emulsions in Drug Delivery and Targeting

S. Benita (editor), Harwood Academic Publishers, New York, pp. 338, ISBN 90-5702-349-0

Although emulsions have been used in pharmaceutical formulation for many years, it is probably fair to say that they have not achieved their full potential, particularly for parenteral drug delivery. This probably stems from their being perceived as 'difficult' systems, expensive to research and troublesome to develop. It is certainly true that they require a substantial investment in knowledge if they are to be developed into successful products, but given suitable information there is no reason why they cannot successfully be used to solve complex formulation problems, avoiding yet another hydrophobic drug from being thrown on the scrapheap of wasted investment.

Thus the potential reader will approach this book asking how much of this required knowledge could be gleaned from it. The answer is, quite a substantial amount, although some areas are better represented than others. The book is organized on a contributed chapter basis, and thus the contents reflect to some extent the activity in the field and the specific interests of the authors. Thus, for example, there are several chapters on solid lipid nanoparticles, and an extensive review on perfluorocarbon oxygen transport emulsions.

The first section of the book (three chapters) discusses intravenous fat emulsions, including chapters on structured triglycerides, particle sizing methods, and biofate and biodistribution. The second section opens with a very general review by Benita and Klang which gives an overview to the field and would have perhaps been better as the introductory chapter. This is followed by a chapter on topical emulsions, and three chapters on solid and supercooled lipid dispersions, covering this area in some detail. The book closes with a review of fluorocarbon emulsions, a field which has already been fairly heavily reviewed in the literature, although this probably is the most complete and up to date summary which this reviewer has seen.

All the chapters are presented to a consistently high standard although they vary in specialization. The book certainly covers a substantial portion of the area and would be a useful introduction to anyone contemplating the use of emulsions, particularly for parenteral use.

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Filtration in the Biopharmaceutical Industry

Theodore Meltzer, Mike Jornitz (editors), Marcel Dekker, New York, 1998, p. 933, \$225.00, ISBN 0-8247-9896-1

One of the co-authors, Theodore Meltzer, published his classic reference 'Filtration in the Pharmaceutical Industry'

more than 10 years ago. Although 12 years have past, much of the content of this book is still pertinent today. David Pall notes, however, in the foreword to the present volume, that much has changed or involved in the pharmaceutical industry, particularly in its biopharmaceutical areas, and also in the filter industry. This warrants an update to Meltzer's first work. Pall lists the need for smaller micron removal ratings than 0.2 μm , integrity testing (validation), protein and preservative binding, documentation and filter extractables. These points, and others, are covered in admirable detail and clarity in this multi-authored work. Indeed, this book assumes a certain biblical significance. I quote from the editors preface: 'There is a tradition of some 2000 years or more that holds that the good Lord undertook creation for the benefit of all humanity, but that each of us is so individual that in effect all of creation was manifest as if intended totally for each. From this it is concluded that one who preserves even a single life saves creation entire. The pharmaceutical and biotechnical industries being dedicated to mankind's well-being and longevity, the contributors to this book may have striven to attain this goal'. I found this opinion very congenial, and expected great things from the book: I was not disappointed.

The book is divided into five parts. Part 1 discusses the various types of filter used in the biopharmaceutical industry. There are chapters on filter aid filtration, expanded PTFE-membranes, charge-modified filters, pre-filters, and cartridge filters. These chapters present more a comprehensive overview of currently available filters, rather than just the developments of the last 10 years. At very best one of the chapters contains 50% of references from the 1990s: the other chapters have much less. Part 2 discusses filter characterization, with chapters on quality assurance, pore size and extractables. The final chapter is particularly readable and contains numerous practical examples of extractables and particle shedding from filters, a lot of which surprised me. Surely, this information is vital knowledge for the pharmacist in charge of parenteral production.

The section entitled 'Utilitarian Considerations' describes partly filter hardware and partly filter working and testing. Thus there are chapters on bacterial biofilms, filtrative particle removal from liquids, filter integrity testing, sizing membrane filters, filter housing materials and filter housings. This is all solid, basic stuff, but again only a small proportion originates from 1990s literature. However, the chapter on filter integrity testing will be particularly valuable for the practical industrial pharmacist. Similarly, I like the very practically oriented chapters on filter housing materials and filter housings. If you are involved with the manufacture of large or small volume parenterals, then there is much of direct practical relevance for you in these chapters. Part 4 entitled 'Applications' describes a host of practical situations concerning filtration. We find, for example, chapters on protein adsorption, filtration of viruses, air filtration, and sterility testing. The chapter entitled 'New Membrane Based Technologies for the