

the eyes of some, including the reviewer, this borders upon malpractice.

Still, this does not invalidate the approach, it is just a transgression of its limitations. The time constant approach may not be a pharmacokinetic panacea, but it is a very interesting and versatile tool. In a future edition, a list of symbols or a statement concerning the policy for choosing main symbols and indexes would be most welcome.

In spite of its price, the book is required reading for the serious pharmacokineticist.

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Microparticulate Systems for the Delivery of Proteins and Vaccines

S. Cohen and H. Bernstein (Editors), *Drug and the Pharmaceutical Sciences*, Vol. 77, Marcel Dekker Inc., New York, 1996. 525 pages. ISBN 0-8247-9753-1

This book contains a number of research and review articles written by various authors. The title of the book tells one pretty well what is to be found; it offers a review of some recent advances in developing microparticulate systems to deliver therapeutic proteins and vaccines. The book starts with the traditional review from *Bob Langer* and colleagues, in this case giving an introduction to the stability of proteins and the principle problems involved in their microencapsulation. The following Chapters 2–5 describe methods of protein microencapsulation including a number of new techniques that avoid the use of organic solvents, e.g. use of supercritical fluids, ionic cross linking of hydrogel-like-polyphosphazenes and use of lipospheres. There follows a chapter describing various spectroscopic methods applied to microsphere characterization. The following 4 chapters then discuss polymeric nanoparticles and liposomes. *Maria Alonso* gives a neat presentation of efficient protein encapsulation in nanoparticles, which is followed by two chapters dealing with 'stealth' systems. There follows an interesting, if very brief, discussion, of polymerised liposomes. The final chapters of the book describe various pharmaceutical applications of microencapsulation technology. There is a description of the pharmacokinetics of microparticulate systems, the potential of micro spheres for oral vaccination is discussed, and the use of gelatine microspheres for gene treatment. Bioadhesive liposomes and modulated protein delivery from microparticulates conclude the book.

This book does not contain much that is new, but presents a good number of typical examples out of the field of microencapsulating proteins. Being a multi-authored work, it reads rather like a book of full-length conference abstracts. There is practically no cross referencing and a certain amount of repetition is found. If you are well up on the literature of microparticulates for proteins and vaccines, you would already be acquainted with most of the work in this volume. The only reason to buy this book would, therefore, be the convenience of having this information in one volume. Otherwise, you could leave it and turn to the original literature.

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Biotechnology in Agriculture and Forestry. Vol. 37: Medicinal and Aromatic Plants IX

Y.P.S. Bajaj (Editor), Springer-Verlag, Berlin, 1996. ISBN 3-540-60597-5

This volume is part of a multi-volume series launched about 10 years ago, with the general idea that specialists working in a particular field of plant biotechnology summarize published and hitherto unpublished results, place it in a broader context and in this way present comprehensive 'biotechnological' monographs of given plant species or genera. The well-edited volume published now comprises 24 chapters dealing with various aspects of plant tissue culture, such as micropropagation and production of valuable natural compounds, in *Agave*, *Anthemis*, *Aralia*, *Blackstonia*, *Catha*, *Catharanthus*, *Cephalocereus*, *Clerodendron*, *Coronilla*, *Gleophyllum* (a fungus!), *Liquidambar*, *Marchantia*, *Mentha*, *Onosma*, *Paeonia*, *Parthenium*, *Petunia*, *Phyllanthus*, *Populus*, *Portulaca*, *Sandersonia*, *Scoparia*, *Serratula*, and *Thapsia*. The subseries title ('Medicinal and Aromatic Plants') is somewhat misleading since plants producing potential food additives others than aromas (e.g. food colours: *Aralia*, *Clerodendron*) as well as plant tissue cultures used as model systems for studying the expression and regulation of secondary metabolism (e.g. *Petunia*, *Portulaca*, *Mentha*) are also considered in this compilation as was done in the previous volumes of the subseries. Although not fully consistent in terms of the quality of the data presented and the conclusions drawn therefrom by the respective chapter authors this compilation is a valuable source of information for all scientists working in plant tissue culture, phytochemistry or the cultivation of medicinal and aromatic plants. Besides the monographs as such, the brief exper-

imental protocols given at the end of each of the 24 chapters and the lists of references (quoting the full titles!) are particularly helpful. The whole series (Vols. 38–41 are in preparation or already published) is becoming a regularly updated standard encyclopedia of plant tissue culture. Unfortunately, as it was already pointed out by A.D. Krikorian when reviewing Vol. 1 of this series “the high cost will preclude many private purchases”. But Krikorian’s closing statement holds true as well: “but libraries need it”.

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Microencapsulation—Methods and Industrial Applications. Drugs and the Pharmaceutical Science Series/73
S. Benita (Editor), Marcel Dekker Inc., New York, 1996. 644 pages, \$150.00. ISBN 0-8247-9703-5

Eighteen chapters, written by different authors, deal with various aspects of microparticulate systems such as microparticles, nanoparticles, lipospheres, liposomes and various types of emulsions. In the first part, methods of encapsulation and advances in production technology are described for microcapsules, microspheres and nanoparticles. The chapters focus on processes related to specific applications as well as on novel developments. The second part of the book deals with the evaluation and characterization of these drug delivery systems, especially with structural aspects of and drug release from microspheres, microparticles, nanoparticles, solid lipid particles and vesicular systems (i.e. conventional liposomes, sterically stabilized liposomes and nonionic surfactant vesicles). The third part focuses on applications of various particulate delivery systems, including microspheres and lipospheres, nanoparticles, liposomes, pharmaceutical emulsions, double emulsions and microemulsion systems. Mainly the fields of cancer therapy and cosmetics are covered. It was certainly not easy to assign all the contributions to a particular part of the book. Nearly each chapter contains information on preparation procedures, structural aspects and some applications. Furthermore, the scope of the book was obviously not to present a final rounded overview of all micro- and nanoparticulate systems or a complete dictionary of preparation procedures and applications for every system. Nevertheless, the contributions are carefully written and contain realistic evaluations of the systems and their potential applications in different fields. The scientific information in the book is through a lot of helpful details

suitable for scientists in pharmaceutical technology in industry and university and can be recommended also for postgraduate students as a lead-in to particulate drug delivery systems.

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Modeling and Data Treatment in the Pharmaceutical Sciences

J.T. Carstensen, Technomic, Lancaster, Basel, 1996.
ISBN 1-56676-440-8

Pharmaceutics has grown out of craftsmanship to become a multi-faceted branch of applied science. Unfortunately, our knowledge of materials and processes is frequently incomplete and we have to rely significantly upon trial-and-error approaches to solve our problems. Still, our quest is to discover and apply general laws and to obtain optimal solutions by systematic work rather than to arrive at merely acceptable ones by chance. Therefore, we strive to represent important characteristics of drugs, excipients and operations in terms of abstract mathematical models.

Of such models, there are two kinds: structural models, which represent the relationships between physical or chemical variables or attributes, and statistical models describing relative frequencies or probabilities.

The former help us to interpret observations in terms of a general context and to predict what will happen under altered conditions or in the future. Even in the absence of such a general theoretical framework, the latter help us to organize experimental data in order to extract relevant and reproducible facts out of numbers, which appear chaotic at first sight. Besides, statistical methods are important for designing experiments and for making rational decisions based upon incomplete information.

This book is about mathematical modeling on both levels, an art that appears to be developing in diverging directions. On the one hand, the power of computers and pre-cooked software solutions allow the less inquisitive to gloss over the intricacies of puzzling results, on the other hand, mighty tools have become available to handle heretofore intractable problems.

The following list is a sample from the titles of 16 chapters: 1, Purpose of Pharmaceutical Research; 2, Representation of Numbers and Data; 5, Curve Fitting and Phenomenology; 6, Normalized Frequency Distributions; 8, Significance Testing; 10, Least Squares Fitting; 11, Iteration; 12, Factorials and Phenomenology; 13, Monte Carlo Method and Simulation; and 15,