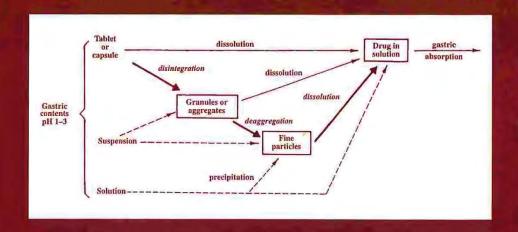
DRUGS AND THE PHARMACEUTICAL SCIENCES

VOLUME #121

Modern Pharmaceutics

Fourth Edition, Revised and Expanded



edited by
Gilbert S. Banker
Christopher T. Rhodes



Modern Pharmaceutics

Fourth Edition, Revised and Expanded

edited by
Gilbert S. Banker
University of Iowa
Iowa City, Iowa

Christopher T. Rhodes
University of Rhode Island
Kingston, Rhode Island



Marcel Dekker, Inc.

New York • Basel



ISBN: 0-8247-0674-9

This book is printed on acid-free paper.

Headquarters

Marcel Dekker, Inc. 270 Madison Avenue, New York, NY 10016 tel: 212-696-9000; fax: 212-685-4540

Eastern Hemisphere Distribution

Marcel Dekker AG Hutgasse 4, Postfach 812, CH-4001 Basel, Switzerland tel: 41-61-261-8482; fax: 41-61-261-8896

World Wide Web

http://www.dekker.com

The publisher offers discounts on this book when ordered in bulk quantities. For more information, write to Special Sales/Professional Marketing at the headquarters address above.

Copyright © 2002 by Marcel Dekker, Inc. All Rights Reserved.

Neither this book nor any part may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, microfilming, and recording, or by any information storage and retrieval system, without permission in writing from the publisher.

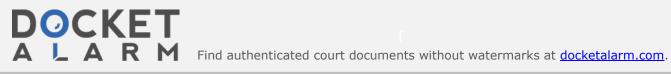
Current printing (last digit): 10 9 8 7 6 5 4 3 2 1

PRINTED IN THE UNITED STATES OF AMERICA

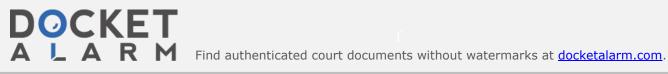


Contents

Contributors Telephone		ix
1.	Drug Products: Their Role in the Treatment of Disease, Their Quality, and Their Status and Future as Drug-Delivery Systems Gilbert S. Banker	1
2.	Principles of Drug Absorption Michael Mayersohn	23
3.	Pharmacokinetics David W. A. Bourne	67
4.	Factors Influencing Drug Absorption and Drug Availability Betty-ann Hoener and Leslie Z. Benet	93
5.	The Effect of Route of Administration and Distribution on Drug Action Svein Øie and Leslie Z. Benet	119
6.	Chemical Kinetics and Drug Stability J. Keith Guillory and Rolland I. Poust	139
7.	Preformulation Jens T. Carstensen	167
8.	Cutaneous and Transdermal Delivery—Processes and Systems of Delivery Gordon L. Flynn	187
9.	Disperse Systems Wandee Im-Emsap, Ornlaksana Paeratakul, and Juergen Siepmann	237



vi		Contents
10.	Tablet Dosage Forms Mary J. Kottke and Edward M. Rudnic	287
11.	Hard and Soft Shell Capsules Larry L. Augsburger	335
12.	Parenteral Products James C. Boylan and Steven L. Nail	381
13.	Design and Evaluation of Ophthalmic Pharmaceutical Products John C. Lang, Robert E. Roehrs, Denise P. Rodeheaver, Paul J. Missel, Rajni Jani, and Masood A. Chowhan	415
14.	Delivery of Drugs by the Pulmonary Route Anthony J. Hickey	479
15.	Sustained- and Controlled-Release Drug Delivery Systems Gwen M. Jantzen and Joseph R. Robinson	501
16.	Target-Oriented Drug-Delivery Systems Vijay Kumar and Gilbert S. Banker	529
17.	Packaging of Pharmaceutical Dosage Forms Thomas J. Ambrosio	587
18.	Optimization Techniques in Pharmaceutical Formulation and Processing Joseph B. Schwartz, Robert E. O'Connor, and Roger L. Schnaare	607
19.	Food and Drug Laws that Affect Drug Product Design, Manufacture, and Distribution Garnet E. Peck and Roland Poust	627
20.	European Aspects of the Regulation of Drug Products with Particular Reference to Development Pharmaceutics Brian R. Matthews	645
21.	Pediatric and Geriatric Aspects of Pharmaceutics Michelle Danish and Mary Kathryn Kottke	667
22.	Biotechnology-Based Pharmaceuticals Paul R. Dal Monte, S. Kathy Edmond Rouan, and Narendra B. Bam	695
23.	The Pharmacist and Veterinary Pharmaceutical Dosage Forms J. Patrick McDonnell and Lisa Blair Banker	725
24.	Dietary Supplements Teresa Bailey Klepser	735
25.	Bioequivalency Christopher T. Rhodes	751



DOCKET

Explore Litigation Insights



Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time** alerts and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.

