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Generic Drug Product Development

Solid Oral Dosage Forms

edited by
Leon Shargel
Isadore Kanfer

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Leon Shargel
Eon Labs, Inc.
Wilson, North Carolina

Isadore Kanfer
Rhodes University
Grahamstown, South Africa

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Preface

Early development and approval of generic drug products was associated with issues concerning safety, efficacy and therapeutic equivalence of such products compared to the innovator or brand-name drug product. Current development of generic drug products is based on sound scientific principles and processes to ensure that these drug products satisfy accepted standards for quality, safety and efficacy prior to obtaining marketing approval. However, the generic pharmaceutical industry is still challenged by legislative, regulatory and scientific issues that must be addressed to allow for the manufacture, approval and marketing of generic drug products.

The objectives of this textbook are to describe, from concept to market approval, the development of high quality, safe and efficacious solid oral generic drug products and to give a comprehensive account of the temporal and legal/regulatory considerations and associated processes from project initiation to marketing approval. The emphasis of this textbook is on the development of solid oral generic drug products. However, much of the material contained in this book may be applied to the development of other generic drug products.

Drug product development for the generic drug industry is different than that for the brand-name pharmaceutical industry. Generic drug product manufacturers must formulate a drug product that will have the same therapeutic efficacy and clinical performance as their brand-name counterpart. Moreover, generic drug product formulators have certain restraints in generic drug product development as well as regulatory and legal challenges that differ from those relating to the development of innovator or brand-name products.

The book initially explains the economic importance for developing therapeutic equivalent drug products and the various legislative and

regulatory issues surrounding the approval process. The reader is guided through the drug development process starting with a discussion on active pharmaceutical ingredients (API's), including their chemistry, patent issues, sourcing and requisite quality specifications and requirements followed by a comprehensive account of analytical method development and validation procedures. Later chapters provide a description of the formulation development process, scale-up, process validation, technology transfer and stability requirements. Quality control and quality assurance requirements for drug products are described along with the importance and utility of in vitro characterization and in vivo performance of solid oral dosage forms.

A comprehensive account of the Abbreviated New Drug Application (ANDA) approval process is discussed, including the organization of the U.S. Food and Drug Administration and ANDA review process. Bioequivalence is discussed in two separate chapters from both a regulatory and statistical perspective, respectively. A brief section of the bioequivalence requirements for generic drug products in Canada, Japan and the European Union is also included.

After market approval, the reader is exposed to issues on scale-up, post-approval changes and post-marketing surveillance. Since most bioequivalence studies are out-sourced, the book gives an account of the services provided by Contract Research Organizations (CRO's) including selection of a CRO, time and cost considerations, project management and the conduct of bioequivalence trials.

Finally, the book discusses legal and legislative hurdles to generic drug development, approval and marketing with an explanation of citizen petitions, exclusivity issues, suitability petitions and other legal matters.

The audiences for this book include undergraduate and graduate pharmacy students, pharmacy faculty, drug manufacturers and regulators in the pharmaceutical industry who are interested in generic drug development and need more information concerning drug product initiation, drug product formulation, biopharmaceutics, drug delivery, bioequivalence, regulatory and legislative issues. Emphasis is on practical information for the development of generic drug products. The text assumes that the reader has basic knowledge in pharmaceutical sciences and is interested in generic drug product development and manufacture.

Leon Shargel, Ph.D.
Vice President, Biopharmaceutics
Eon Labs Inc.
Wilson, NC, U.S.A.

Adjunct Associate Professor
School of Pharmacy
University of Maryland
Baltimore, MD, U.S.A.

Izzy Kanfer, Ph.D.
Professor of Pharmacy
Dean & Head
Faculty of Pharmacy
Rhodes University,
Grahamstown, South Africa

Contributors

Salah U. Ahmed Research & Development, Barr Laboratories, Inc., Pomona, New York, U.S.A.

Timothy W. Ames Division of Labeling and Program Support, Office of Generic Drugs, Center for Drug Evaluation and Research, U.S. Food and Drug Administration, Rockville, Maryland, U.S.A.

Karen A. Bernard Chemistry Division II, Office of Generic Drugs, Center for Drug Evaluation and Research, U.S. Food and Drug Administration, Rockville, Maryland, U.S.A.

Pranab K. Bhattacharyya Quality Management and Analytical Services, Eon Labs, Inc., Laurelton, New York, U.S.A.

Sanford Bolton University of Arizona, Tuscon, Arizona, U.S.A.

Sadie M. Ciganek Regulatory Affairs, Eon Labs, Inc., Laurelton, New York, U.S.A.

Edward M. Cohen* Business Development, Schein Pharmaceuticals, Inc., Danbury, Connecticut, U.S.A.

Dale P. Conner Division of Bioequivalence, Office of Generic Drugs, Center for Drug Evaluation and Research, U.S. Food and Drug Administration, Rockville, Maryland, U.S.A.

Current affiliation: EMC Consulting Services, Newtown, Connecticut, U.S.A.

Barbara M. Davit Division of Bioequivalence, Office of Generic Drugs, Center for Drug Evaluation and Research, U.S. Food and Drug Administration, Rockville, Maryland, U.S.A.

Beth Fabian Fritsch Division of Labeling and Program Support, Office of Generic Drugs, Center for Drug Evaluation and Research, U.S. Food and Drug Administration, Rockville, Maryland, U.S.A.

Quanyin Gao Watson Laboratories, Inc., Corona, California, U.S.A.

Loren Gelber Quality and Compliance, Andrx Pharmaceuticals, LIC, Davie, Florida, U.S.A.

Ajaz S. Hussain Office of Pharmaceutical Sciences, Center for Drug Evaluation and Research, U.S. Food and Drug Administration, Rockville, Maryland, U.S.A.

Joan Janulis Regulatory Affairs, Able Laboratories, Inc., Cranbury, New Jersey, U.S.A.

Izzy Kanfer Division of Pharmaceutics, Faculty of Pharmacy, Rhodes University, Grahamstown, South Africa

Koung Lee Division of Labeling and Program Support, Office of Generic Drugs, Center for Drug Evaluation and Research, U.S. Food and Drug Administration, Rockville, Maryland, U.S.A.

Lih-Yang Lin[†] Regulatory and Technology Division, ScinoPharm, San Matteo, California, U.S.A.

Aruna J. Mehta New Products, Eon Labs, Inc., Laurelton, New York, U.S.A.

Frank J. Mellina Eon Labs, Inc., Laurelton, New York, U.S.A.

Venkatesh Naini Schering-Plough Research Institute, Kenilworth, New Jersey, U.S.A.

Patrick K. Noonan PK Noonan & Associates, LLC, Richmond, Virginia, U.S.A.

Larry A. Ouderkirk Office of Pharmaceutical Sciences, Center for Drug Evaluation and Research, U.S. Food and Drug Administration, Rockville, Maryland, U.S.A.

Peter Persicaner Arrow Pharmaceuticals, Croydon, Victoria, Australia

[†] Deceased.