JOURNAL OF CHEMICAL EDUCATION

Book and Media Review

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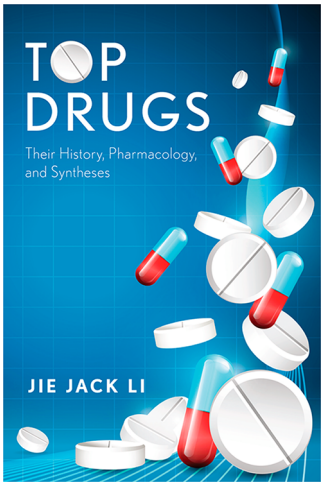
Review of *Top Drugs: Their History, Pharmacology, and Syntheses*

Michael B. Jacobs*

Department of Chemistry, Metropolitan State University of Denver, Denver, Colorado 80217, United States

Top Drugs: Their History, Pharmacology, and Syntheses, by Jie Jack Li. Oxford University Press: New York, 2015. 206 pp. ISBN 978-0199362585 (hardcover). $34.95.

Blockbuster drugs for treating common health conditions have become part of our daily lives. We are bombarded with television commercials and advertisements for these so-called "life-changing" drugs everywhere. Jie Jack Li's textbook, *Top Drugs: Their History, Pharmacology, and Syntheses,* introduces readers to a detailed study of the development, chemistry, pharmacology, and impact of ten top drugs. As indicated in the book's preface, *Top Drugs* is a 206-page textbook that materialized from a course the author taught at the University of Pittsburgh. Li clearly states in the preface: "This book is geared toward undergraduate institutions interested in offering a short course on this topic." In addition, his intentions in writing this text are to "acclimate undergraduate students to the 'real world' of chemistry and drug discovery." Li does just this with this new exciting text.



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The author takes an elegant approach by integrating organic chemistry, biochemistry, pharmacology, medicinal chemistry, and biology via the application of these blockbuster drugs. *Top Drugs* is organized into ten easy-to-follow chapters. The chapters in this book range from approximately 10 to 20 pages in length. The author focuses on drugs for metabolic diseases, cancer, infectious diseases, and the central nervous system (CNS) in addition to cardiovascular drugs and ulcer drugs. One chapter is dedicated to each of the brand-name drugs covered in this text: Lipitor, Plavix, Norvasc, Taxol, Gleevec, Januvia, Cymbalta, Zypexa, Sovaldi, and Nexium. At the beginning of each chapter, the structure of the pharmaceutical is given, followed by the United States adopted name (USAN), brand name, molecular weight, Food and Drug Administration (FDA) approval date, drug class, indications, and mechanism of action. Following this, a story and the science of each drug vividly unfold, starting with the history, then the pharmacology, the synthesis, and conclusions. All of the structures and mechanisms in the textbook are clear and straightforward. In the history section, the author presents readers with a brief yet detailed narrative discussing the drug's biological importance and application, discovery, facts, pros and cons, and drug development, all in chronological order. The pharmacology section covers the drug's mechanism of action, the relationship between the drug's structure and activity, and the drug's bioavailability, metabolism, and toxicology. The next section connects the reader to the synthesis of the drug. In the conclusion, the author discusses the impacts, future challenges, and goals associated with each drug. References are listed at the end of each chapter.

A closer look at Chapter 5 will provide a more detailed picture of the layout of each chapter. Approximately 20 pages long, Chapter 5 is grouped with Cancer Drugs and covers the cancer drug imatinib mesylate (Gleevec). The first page of the chapter presents a structural formula of Gleevec followed by a list: USAN, brand name, molecular weight, FDA approval date, drug class, indications, and mechanism of action. After this brief introduction, there is a short paragraph describing Gleevec's role as a cancer drug along with a short sentence about this drug's sales performance. The first section of the chapter is the history section. In approximately 10 pages of background, the author presents a robust description of the drug's history using chemical and biological figures and chemical structures. This section is the majority of the chapter and is divided into several parts: A Brief History of Cancer Drugs; Treatments of Chronic Myeloid Leukemia; Protein Kinase Inhibitors; and the Genesis of Gleevec. In the next section, the author brings forth the pharmacology of Gleevec. In three brief paragraphs, a glimpse of the role Gleevec undergoes in vitro is given in Mechanism of Action. In the pharmacology section, Structure−Activity Relationship, the author provides the medicinal chemistry of this drug. A reaction scheme is given, along with some interesting details about the drug's discovery. What occurs after the drug is administered orally is covered in Bioavailability, Metabolism, and Toxicology. The synthesis of this drug is covered in Discovery Synthesis and Process Synthesis. Here the author gives several detailed reaction schemes for readers to digest regarding the synthesis of imatinib mesylate. The chapter ends with Concluding Remarks and References.

In conclusion, *Top Drugs* is an excellent text for a one-semester introductory course about the chemistry of drugs. Although this book is aimed at the level of senior undergraduates, it could also be used for a first-year graduate course

DOI: 10.1021/acs.jchemed.6b00287
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in medicinal chemistry and related courses. The author also mentions that scientists in "industry will also find it useful to understanding the landscape of current drug discovery and development." Background coursework in organic chemistry, biochemistry, and biology is needed to use this text. Students with an interest in medicinal chemistry and majoring in pharmacy, chemistry, and health-related fields should benefit from reading this book. It is refreshing to read a text that uses fundamental science coupled with applications. This book is enthusiastically recommended!

AUTHOR INFORMATION

Corresponding Author

*E-mail: mjacob35@msudenver.edu.

Notes

The authors declare no competing financial interest.

DOI: 10.1021/acs.jchemed.6b00287
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