Chirality in Drug Research

Edited by *Eric Francotte* and *Wolfgang Lindner.*

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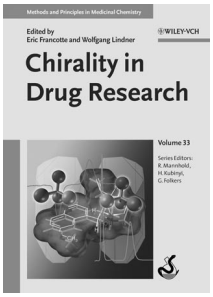

Industrial and academic researchers interested in acquiring or simply studying this book should base their decision on the content of the back cover (the so-called 'blurb') of *Chirality in Drug Research*, not on its title. Indeed, this book is dedicated to synthesis (three chapters) and separations (five chapters), whereas there is no need to spell out how far drug research extends beyond these two major domains of drug discovery and development.

Chapter 1 is a nice historical introduction (24 pages) written by Joseph Gal, a well-known expert in stereochemical nomenclature. This chapter also contains useful clarifications of a few terms and points to some highlights of drug chirality in the 20th Century. Part 1 (Synthesis) opens with Chapter 2 (37 pages) dedicated to stereoselective synthesis in an industrial perspective. The chapter begins with historical examples and continues with a perspective of the industrial scale, stereochemical catalysis, and an overview of asymmetric reactions which comprises reductions, oxidations, and carbon–carbon bond formation. While this chapter has much of great value to offer, one can regret the absence of the broader view taken by the same author in an outstanding review (*Chirality* **2003**, *15*, S128). Chapter 3 (28 pages) is dedicated to chirality in leads and drugs of natural origin. Methods to determine the configuration of natural products are summarized. This is followed by some examples of stereochemical control in biosynthesis. The chapter also gives welcome attention to a few examples of stereoselective bioactivity. The last chapter in this Part (Chapter 4, 29 pages) is a valuable and informative review of biotransformation methods for preparing chiral intermediates and drugs. The chapter begins with selected applications, continues with a systematic exploration of relevant enzyme types (hydrolases, oxidoreductases, etc.), and concludes with recent developments.

The second Part of the book (Separations) opens with Chapter 5 (28 pages) dedicated to resolution by crystallization. The reader will find here a logical and didactic presentation of principles and applications. Chapter 6 (33 pages), written by one of the volume's editors, covers the isolation and production of optically pure compounds by enantioselective chromatography using chiral stationary phases. Other techniques such as membrane-based separation, centrifugal partition chromatography and electrophoresis are also briefly presented. This is followed by Chapter 7 (72 pages), a large piece by the other editor. The chapter is in fact a remarkably well-organized and comprehensive review of stereoselective chromatographic methods in drug analysis, and its optimal placement would have been before Chapter 6. Chiral drug analysis by capillary electrophoresis (CE) coupled to mass spectrometry (MS) is the topic of Chapter 8 (21 pages). This is a logical and up-to-date presentation of many CE–MS techniques, with a strong emphasis of principles and applications. Chapter 9 (39 pages) concludes this second Part by presenting the preparation of enantiopure alcohols and the determination of their absolute configuration by X-ray crystallography and NMR spectroscopy. This chapter is written for the specialist, but behind its rather awkward title lies a current review of methods to determine absolute configuration as applied to chiral alcohols.

The book ends with a 'potpourri' (Chapter 10, 18 pages) of computer tools in chirality research. This collection features useful sections such as applications in molecular modeling and chiral catalysis, the most valuable of which is the compilation of relevant softwares. In contrast, the short section on QSAR is unsatisfactory and ignores eudismic analysis.

In general, the book has been well-edited and produced and contains a useful subject index. However, there are a few defects such as one systematic inadequacy in nomenclature (namely, a chemical property such as rotation must appear before a chemical name, not within) and a lack of homogeneity in the format of the chemical drawings. The many occurrences of the name of the late Professor E. J. Ariëns (one of the giants in chiral drug research) are consistently misspelled. And the Preface, signed by the three series editors, begins with what appears as a grotesquely mis-edited quotation of unspecified origin: "It are [sic] the 21 stereocenters in the gycopeptide [sic] antibiotics that give […] headache for my students […]." In conclusion and neglecting some details, this book has very much to offer within its scope, but may disappoint any buyer attracted by its discrepant title.

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