

Basic Concepts in Medicinal Chemistry

By Dr. Marc Harrold Ph.D, Dr. Robin Zavod Ph.D

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Medicinal chemistry is a complex topic. Written in an easy to follow and conversational style, Basic Concepts in Medicinal Chemistry focuses on the fundamental concepts that govern the discipline of medicinal chemistry as well as how and why these concepts are essential to therapeutic decisions. The book emphasizes functional group analysis and the basics of drug structure evaluation.

In a systematic fashion, learn how to identify and evaluate the functional groups that comprise the structure of a drug molecule and their influences on solubility, absorption, acid/base character, binding interactions, and stereochemical orientation. Relevant Phase I and Phase II metabolic transformations are also discussed for each functional group.

Key features include:
• Discussions on the roles and characteristics of organic functional groups, including the identification of acidic and basic functional groups.
• How to solve problems involving pH, pKa, and ionization; salts and solubility; drug binding interactions; stereochemistry; and drug metabolism.
• Numerous examples and expanded discussions for complex concepts.
• Therapeutic examples that link the importance of medicinal chemistry to pharmacy and healthcare practice.
• An overview of structure activity relationships (SARs) and concepts that govern drug design.
• Review questions and practice problems at the end of each chapter that allow readers to test their understanding, with the answers provided in an appendix.

Whether you are just starting your education toward a career in a healthcare field or need to brush up on your organic chemistry concepts, this book is here to help you navigate medicinal chemistry.

About the Authors

Marc W. Harrold, BS, Pharm, PhD, is Professor of Medicinal Chemistry at the Mylan School of Pharmacy, Duquesne University, Pittsburgh, PA. Professor Harrold is the 2011 winner of the Omicron Delta Kappa "Teacher of the Year"

award at Duquesne University. He is also the two-time winner of the "TOPS" (Teacher of the Pharmacy School) award at the Mylan School of Pharmacy.

Robin M. Zavod, PhD, is Associate Professor for Pharmaceutical Sciences at the Chicago College of Pharmacy, Midwestern University, Downers Grove, IL, where she was awarded the 2012 Outstanding Faculty of the Year award. Professor Zavod also serves on the adjunct faculty for Elmhurst College and the Illinois Institute of Technology. She currently serves as Editor-in-Chief of the journal Currents in Pharmacy Teaching and Learning.

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Editorial Review

Review

Basic Concepts of Medicinal Chemistry
By Marc W. Harrold and Robin M. Zavod
Pharmaceutical Journal, Volume 290, Page 343, March 23, 2013

Reviewer: Laurence A Goldberg is a pharmaceutical consultant from Bury, Lancashire

All you need to know about medicinal chemistry.

This book focuses solely on the basic, fundamental concepts governing the discipline of medicinal chemistry. Every drug is a chemical structure that contains numerous functional groups arranged in a specific manner. These functional groups determine the interactions of the drug molecule with its biological target, its pharmacological action, the route by which it is administered, the extent to which it is metabolized and the presence or absence of specific adverse reactions or drug interactions.

The chapters in this book have been carefully organized to allow the reader to gain knowledge progressively about the chemistry of drug molecules, with each chapter building on the previous one. The first chapter reviews the numbering of alicyclic and heterocyclic rings, the designation of aromatic ring positions and steroid nomenclature, while the second chapter focuses on the chemical characteristics of functional groups and the roles they play in drug action.

The following chapters identify those functional groups that are acidic or basic, review a strategy to calculate the extent to which they are ionised in a given environment and then examine how these characteristics contribute to the overall solubility of the drug molecule. Subsequent chapters discuss the types of binding interactions that can occur between a drug molecule and its biological target and how stereochemistry of the molecule can also affect its interaction with biological targets. Emphasis is placed on the pharmacological and therapeutic differences that can occur between enantiomers.

A chapter is devoted to exploring the metabolism of drug molecules by various enzymes. It identifies the functional groups that are susceptible to each type of metabolic transformation, enabling the reader to become more proficient in predicting the possible metabolic transformations for a given drug molecule. In the final chapter, the concept of structure-activity relationships is introduced along with the concepts of molecular modification to design new drugs and analogues of existing drugs. This book is extremely well structured and easy to follow. It navigates through medicinal chemistry in a way that makes the subject easy to understand. It will be a great asset to students embarking upon a healthcare career or to practitioners who need to brush up on medicinal chemistry.
(Laurence A. Goldberg *Pharmaceutical Journal* 2013-03-23)

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(Thomas L. Lemke, PhD *Pharmacy Teaching and Learning* 2013-04-04)

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