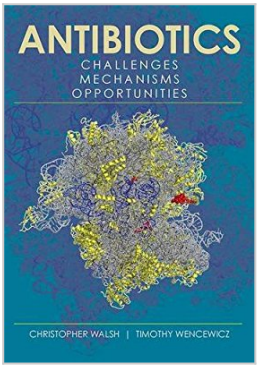

Antibiotics: Challenges, Mechanisms, Opportunities

By Christopher Walsh, Timothy Wencewicz

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A chemocentric view of the molecular structures of antibiotics, their origins, actions, and major categories of resistance

Antibiotics: Challenges, Mechanisms, Opportunities focuses on antibiotics as small organic molecules, from both natural and synthetic sources. Understanding the chemical scaffold and functional group structures of the major classes of clinically useful antibiotics is critical to understanding how antibiotics interact selectively with bacterial targets.

This textbook details how classes of antibiotics interact with five known robust bacterial targets: cell wall assembly and maintenance, membrane integrity, protein synthesis, DNA and RNA information transfer, and the folate pathway to deoxythymidylate. It also addresses the universe of bacterial resistance, from the concept of the resistome to the three major mechanisms of resistance: antibiotic destruction, antibiotic active efflux, and alteration of antibiotic targets. *Antibiotics* also covers the biosynthetic machinery for the major classes of natural product antibiotics.

Authors Christopher Walsh and Timothy Wencewicz provide compelling answers to these questions:

- What are antibiotics?
- Where do antibiotics come from?
- How do antibiotics work?
- Why do antibiotics stop working?
- How should our limited inventory of effective antibiotics be addressed?

Antibiotics is a textbook for graduate courses in chemical biology, pharmacology, medicinal chemistry, and microbiology and biochemistry courses. It is also a valuable reference for microbiologists, biological and natural product chemists, pharmacologists, and research and development scientists.

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Editorial Review

Review
This book provides all the information needed to understand antibiotic genetics, biochemistry, mechanism of action and resistance. Most importantly, Walsh & Wencewicz are optimistic of the prospects of the discovery of novel therapeutic agents obtained by the manipulation of strains and biosynthetic pathways. This beautifully written book deserves to be read and implemented by everyone, especially the pessimists who believe that the antibiotic era has ended. In Antibiotics: Challenges, Mechanisms, Opportunities, Walsh & Wencewicz provide the definitive, ultimate compendium of everything antibiotic. --Julian Davies, Professor of Microbiology and Immunology, Life Sciences Institute, University of British Columbia Vancouver

From the Inside Flap
"A chemocentric view of the molecular structures of antibiotics, their origins, actions, and major categories of resistance Antibiotics: Challenges, Mechanisms, Opportunities focuses on antibiotics as small organic molecules, from both natural and synthetic sources. Understanding the chemical scaffold and functional group structures of the major classes of clinically useful antibiotics is critical to understanding how antibiotics interact selectively with bacterial targets. This textbook details how classes of antibiotics interact with five known robust bacterial targets: cell wall assembly and maintenance, membrane integrity, protein synthesis, DNA and RNA information transfer, and the folate pathway to deoxythymidylate. It also addresses the universe of bacterial resistance, from the concept of the resistome to the three major mechanisms of resistance: antibiotic destruction, antibiotic active efflux, and alteration of antibiotic targets. Antibiotics also covers the biosynthetic machinery for the major classes of natural product antibiotics. Authors Christopher Walsh and Timothy Wencewicz provide compelling answers to these questions: [[What are antibiotics? [[Where do antibiotics come from? [[How do antibiotics work? [[Why do antibiotics stop working? [[How should our limited inventory of effective antibiotics be addressed? Antibiotics is a textbook for graduate courses in chemical biology, pharmacology, medicinal chemistry, and microbiology and biochemistry courses. It is also a valuable reference for microbiologists, biological and natural product chemists, pharmacologists, and research and development scientists. "

About the Author
Christopher Walsh is a Harvard Medical School professor emeritus who serves as a senior advisor to the ChEM-H Center at Stanford University. He has authored hundreds of papers and books, including the predecessor to this title, Antibiotics: Origins, Actions, Resistance (2003). Dr. Walsh is a member of the U.S. National Academy of Sciences, the U.S. National Academy of Medicine, the American Academy of Arts and Sciences, and the American Philosophical Society and a co-recipient of the 2010 Welch Prize in Chemistry.

Timothy Wencewicz is a faculty member in the Department of Chemistry at Washington University in St. Louis. After receiving his PhD at the University of Notre Dame, he was a postdoctoral fellow in Christopher Walsh s laboratory at the Harvard Medical School. Dr. Wencewicz s research centers on antibiotic drug discovery, natural product biosynthesis, and targeted drug delivery across bacterial membranes.

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