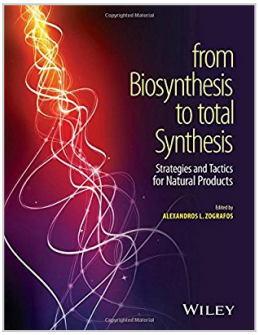

From Biosynthesis to Total Synthesis: Strategies and Tactics for Natural Products

By Alexandros L. Zografos

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Focusing on biosynthesis, this book provides readers with approaches and methodologies for modern organic synthesis. By discussing major biosynthetic pathways and their chemical reactions, transformations, and natural products applications; it links biosynthetic mechanisms and more efficient total synthesis.

• Describes four major biosynthetic pathways (acetate, mevalonate, shikimic acid, and mixed pathways and alkaloids) and their related mechanisms
• Covers reactions, tactics, and strategies for chemical transformations, linking biosynthetic processes and total synthesis
• Includes strategies for optimal synthetic plans and introduces a modern molecular approach to natural product synthesis and applications
• Acts as a key reference for industry and academic readers looking to advance knowledge in classical total synthesis, organic synthesis, and future directions in the field

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Editorial Review

From the Back Cover

The biosynthesis of natural products has given knowledge and inspiration to chemists from the beginning of modern synthetic chemistry. Over time, a better understanding of biosynthetic mechanisms has led to the discovery of revolutionary fields, like biomimicry in chemistry and material science, accelerating today's innovations in modern asymmetric synthesis. Tools like asymmetric epoxidation, aldol and organocatalytic reactions, and the concepts of catalysis and CH-activation have their origin in biosynthesis. It is crucial for scientists to gain a comprehensive understanding of biosynthetic mechanisms to improve the productivity and efficiency of organic synthesis now and in the future.

Focusing on biosynthesis, *From Biosynthesis to Total Synthesis: Strategies and Tactics for Natural Products* provides readers with approaches and methodologies for optimal synthetic planning. By discussing the roots of chemical reactivity within the major biosynthetic pathways, it offers a fresh perspective on how total synthesis of natural products can be approached. The chapters cover the major classes of natural products: polyketides, lipids, polyethers, terpenes, lignans, and alkaloids. Each chapter is further divided into three comprehensive sections: biosynthesis, methodology, and total synthesis; allowing on the direct comparison between biosynthesis and the developed methodologies that are used in modern total synthesis. The final section explains future directions of modern organic synthesis, touching upon engineered biosynthesis, diversity-oriented synthesis, biology-oriented synthesis, and the promise of merging total synthesis with biosynthesis.

With contributions by leading organic chemists from around the world, *From Biosynthesis to Total Synthesis: Strategies and Tactics for Natural Products* acts as a key reference for industry and academic readers who are looking not only to advance their knowledge in modern methodologies of organic synthesis, but also to classical total synthesis, as a means to gain future insights in the field.

About the Author
Alexandros L. Zografos graduated as a chemist from the National and Kapodistrian University of Athens, Greece. After earning his PhD in 2001 at the National Technical University of Athens, he pursued his postdoctoral studies with Prof. Phil Baran at the Scripps Research Institute and Prof. Scott Snyder at Columbia University before he moved back to Greece to work as a senior researcher at the National and Kapodistrian University of Athens and NCRS Demokritos Institute. In 2009, he began his independent career at the Aristotle University of Thessaloniki, Greece, where he is currently an assistant professor of organic chemistry. His group is working on divergent total synthesis of complex natural products and on the development of novel CH activation reactions.

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