

The development of novel and efficient tools for synthesis has been, and still is, closely connected with the synthesis of natural products and bioactive compounds. Firstly, the ever-increasing complexity of the target structures demands more and more selective, milder, and also economical procedures. Secondly, successful applications of these tools in total synthesis are clear evidence of their practicability and effectiveness. In many cases the design, the quality, and thus the elegance of a synthesis are based on the clever implementation of modern synthetic methods.

The book *Modern Tools for the Synthesis of Complex Bioactive Molecules*, edited by Janine Cossy and Stelios Arseniyadis, is devoted to this multifaceted topic. The 16 chapters, written by different author teams, describe the application of innovative modern synthetic methods and techniques in the preparation of sophisticated natural products and other compounds of biological and pharmacological interest. The importance of these tools is illustrated by many impressive examples.

The contents of the book can be divided into five topic areas. In the first part, modern reactions that have proven their usefulness as the key steps of many natural product syntheses are described. Chapters 1–5 on transition-metal-catalyzed coupling reactions (C–H functionalizations, Negishi cross-couplings, C–heteroatom couplings, metathesis reactions, and gold-catalyzed transformations) are followed by two chapters about enantioselective organocatalysis (enamine/iminium catalysis and phase-transfer catalysis). Chapters 8 and 9 then deal with rearrangements and domino reactions, important transformations that often allow a significant gain in complexity within a single step.

The second part of the book (Chapters 10 and 11) covers two new techniques, the use of “light fluororous linkers” and of immobilized reagents in flow chemistry systems, which may offer enormous advantages in the control of reactions and in the isolation of products.

The third part (Chapters 12 and 13) deals with specific strategies for the directed synthesis of

oligosaccharides and alkaloids (the latter compounds via ammonium ylides), then the fourth part (Chapters 14 and 15) consists of two contributions about engineered biosynthesis (enzymatic preparation of complex natural product analogs starting from non-natural substrates) and about diversity-orientated syntheses. In the fifth and last part (Chapter 16), the two editors discuss a related side topic, the use of DNA in organic synthesis, for example in enantioselective transformations.

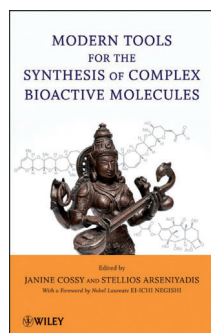
Most of the chapters in this book are well-written and well-structured, and provide a comprehensive and detailed (but not too detailed and thereby tedious) insight into the research areas covered. After introductory background information about a method or technique, the main focus is, of course, on its application in the synthesis of bioactive compounds. The compiled material is substantial, representative, and up-to-date. It impressively shows the importance of the modern tools and their influence on developments and progress in natural products synthesis, in particular over the last decade.

With the broad spectrum of topics, the editors have aimed to combine a large number of current trends in natural products synthesis within a single book. As the book does not focus on specific narrow areas, not all chapters will be of equal interest for many readers—on the other hand, this selection provides an excellent opportunity to grasp good overviews about facets in natural products synthesis that may be less familiar to the reader.

I personally have read this book with great interest. Particularly noteworthy is the first part, showing the great power of modern catalysis and the elegant synthetic strategies derived therefrom. The whole potential of a modern reaction or technique is often not fully recognized until one sees all the successful applications to complex structures, as is possible in many parts of this book. Therefore, I warmly recommend this book to any student interested in the synthesis of complex compounds, and I am sure that also experts in this field will discover interesting new aspects.

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