

Book Reviews

Recent Progress in the Chemical Synthesis of Antibiotics and Related Microbial Products, Vol. 2. Edited by G. Lukacs. Springer: Berlin; 1993, X + 970 pp., hardback. DM 348. ISBN 3-540-56754-2

This book was inspired by two recent international conferences on the Chemical Synthesis of Antibiotics and Related Microbial Products held in Oiso, Japan in 1990 and in Kloster Blanz, Germany in 1992. Many of the contributors were participants at these meetings, while the preceding Volume 1 of this series was based on an earlier EuChem meeting in France. These meetings deal with all aspects of the chemistry of antibiotics and other bioactive microbial metabolites, with significant emphasis given to total synthesis and semi-synthetic studies.

Papers 1 to 5 deal with aspects of the chemistry, chemical modification and synthesis of various macrolide antibiotics (tetroneolide, chlorothricolide, monocillins, erythromycin, FK506). The first paper (J. Vilarrasa *et al.*) is particularly significant for the synthetic chemist, providing a critical account, together with a comprehensive literature survey, of available methods for the closure of macrocyclic rings. Nowadays it is possible to synthesise a wide range of macrolide systems of ever-increasing structural complexity, but the key macrocyclisation (often a macrolactonisation) step usually remains an unknown variable. Since this is often performed towards the end of the synthesis, it can – and often does – present serious difficulty if the acyclic conformation and/or activation method are inappropriate. This contribution gives one an idea of which are the most reliable cyclisation methods to try with a useful table of successful substrates (unsuccessful ones are omitted!). Another notable contribution (M. T. Goulet *et al.*) deals with the chemistry, mechanism of action, structural modification and total synthesis of the potent immunosuppressant FK506. Over the last 5 years, this has been a rapidly moving area of research and this timely review brings the topic together in an authoritative manner. The synthetic accomplishments, methods and strategies of many research groups are highlighted. The total synthesis of FK506 stands as one of the most remarkable achievements of modern synthetic chemistry and demonstrates the recent rapid progress made in constructing such highly functionalised and stereochemically taxing targets.

Papers 6 to 9 cover the synthetic chemistry of certain antibiotics with anticancer activity, encompassing anthracyclines (nogalamycin), aryl C-glycosides, and enediynes. The enediyne antibiotics (calicheamicin/esperamicin, dynemicin, and neocarzinostatin classes) are currently prominent in the primary literature. Here the mechanistic and synthetic aspects of these remarkable DNA cleaving compounds are well treated in two papers (D. S. Grierson *et al.*, M. Hiram). Reviews on the total synthesis of aryl C-glycoside (K. Suzuki, T. Matsumoto) and orthosomycin (H.-D. Scharf *et al.*) antibiotics highlight the scope and limitations

of current methods for glycosidic bond formation. The remaining papers describe the chemistry and synthesis of β -lactams and β -lactamase inhibitors, antifungals (ambruticin), antimicrobials (methylenomycin B, cerulenin) and glycosidase inhibitors (castanospermine *etc.*). Recent developments in the chemistry and total synthesis of cholesterol-lowering drugs related to compactin and mevinnic acid are also reviewed (Y. Chapleur).

The camera-ready contributions in this book are generally produced to a high standard, notwithstanding the wide variety of formats employed for the text and structures. On some occasions, however, the use of poor quality structural diagrams is a slight irritation, while the absence of a general index for the work is an annoyance.

As usual in such publications, many of the more significant topics covered have all received (or will receive) review treatments elsewhere. Nevertheless, it is still useful to have this collection of 18 papers (in a weighty 970 pages) together for ready reference and general browsing. This book will appeal to organic chemists interested in total synthesis and natural products chemistry, the active practitioner as well as the passive enquirer.

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