

Preface

The significance of the stereocontrolled synthesis of chiral and achiral β -lactams with their mechanism of formation has gained attention in connection with the structure–activity relationship study and the development of β -lactam antibiotics, β -lactam anticancer agents, cholesterol-lowering drugs, nitrogen-containing heterocycles and inhibitors of β -lactamases. However, β -lactam antibiotics have still occupied a major role in the treatment against pathogenic bacteria and thus improve in quality of human life. But, the extensive use of common β -lactam antibiotics (e.g., penicillins and cephalosporins) in medicine has created severe obstacles because of an increasing number of resistant strains of bacteria through mutation and β -lactamase gene transfer. Due to the increased bacterial as well as tumor cell resistance, there has been enormous effort devoted to prepare new structural types of compounds having the 2-azetidinone ring as a common feature. The diversity of this book by Springer “Heterocyclic Scaffolds I: β -Lactams” in “Topics in Heterocyclic Chemistry” is confirmed in the wide range of significant topics written by experts in this field.

Each one of the seven chapters presented in this book has focused on the very recent aspects in the β -lactam research. Alcaide and Almendros as well as Bari and Bhalla have described very powerful strategies for the preparation of unusual spirocyclic β -lactams. Troisi et al. and Palomo and Oiarbide have described the synthesis and application of β -lactams for the preparation of nitrogen-containing molecules. Basu et al. describe the preparation of β -lactams using solid-supported reagents. Cossio’s group has studied computational approach to identify the mechanistic routes on the synthesis of a variety of β -lactams. Development of novel anticancer β -lactams along with their mechanisms of action has been provided by our group.

I take this opportunity to sincerely thank and congratulate the authors for their very significant and useful contribution. This book provides a deeper understanding of the art of β -lactam research to the chemists, biologists, pharmacologists, and clinicians at industrial and/or academic research institutions throughout the world.

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