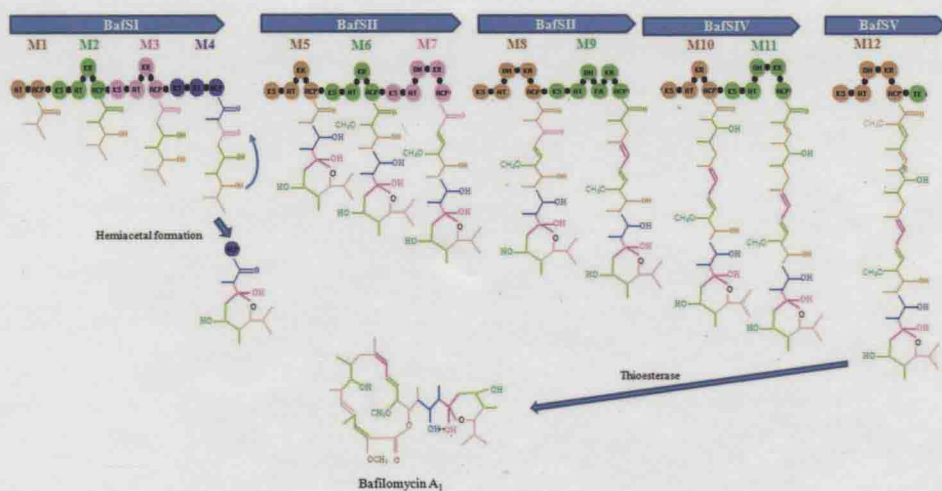


BIOSYNTHESIS OF HETEROCYCLES

FROM ISOLATION TO GENE CLUSTER



PATRIZIA DIANA
GIROLAMO CIRINCIONE

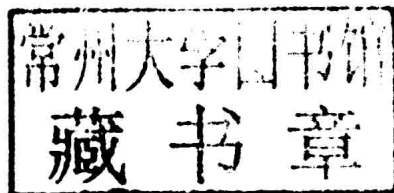
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BIOSYNTHESIS OF HETEROCYCLES

From Isolation to Gene Cluster

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BIOSYNTHESIS OF HETEROCYCLES

To Gabriella, Giovanni, and little Vincenzo.

PREFACE

This book, which is devoted to the biosynthesis of heterocycles, presents the isolation of heterocycles and their related sources, their structural determination, biosynthetic studies on them, and, whenever available, the identification of the gene clusters. It also reports several cases in which gene manipulations allowed the biosynthesis of unnatural compounds generally used in medicinal chemistry.

The book is organized into seven chapters. In the introductory chapter, the synthetic pathways of some natural products illustrating the basic common reactions in secondary metabolites are described. In Chapter 2, methods and techniques involved in the biosynthesis of heterocycles are dealt with. The subsequent four chapters deal with three- to six-membered heterocycles starting from the natural products to approach the preparation of unnatural heterocyclic compounds with particular attention to bioactive molecules. In Chapter 7, seven- and eight-membered heterocycles are treated, as well as larger ones, using the same approach as used in the preceding four chapters.

Because of the incredibly large number of isolated heterocycles from natural sources, a selection had to be made, choosing both those possessing biological activity and those isolated in the past 15 years.

To the best of our knowledge, there are currently no books available with a special emphasis on the biosynthesis of the whole range of heterocycles following a highly systematic approach and also dealing with the identification of the gene clusters and the use of biogenetic engineering to get unnatural compounds of pharmaceutical interest.

This book is primarily addressed to meet the requirements of graduate and postgraduate students in biology, biochemistry, biotechnology, chemistry, and pharmacy. This book can also be a useful tool for teachers of the degree courses

mentioned and for investigators and professionals (industry) working within the fields of medicinal, organic, and process chemistry. A secondary audience can be constituted by biochemists, enzymologists, and microbiologists.

Finally, we have to mention the support given to us by our partners, to whom this book is dedicated and without whose continued patience and understanding this book would not have been possible.

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