From the date of the publication of the first edition of this book, the synthesis and application of enantiopure β-amino acids have continued to emerge as very important and challenging synthetic endeavors. Indeed, whereas only 5 pertinent literature entries on this subject are registered prior to 1980 and 11 for the period 1980–1990, more than 500 reports have appeared during 1991–2004.

Much of the work related to enantioselective synthesis of chiral β-amino acids published before 1996 was reviewed in the first volume of this series; nevertheless, the unprecedented growth in the field of asymmetric synthesis of β-amino acids prompted the preparation of a second volume that not only updates the reviews included in the first volume but also covers novel developments in the field. In particular, several chapters are dedicated to discuss exciting advances in the synthesis of β-peptides and comparison of their structural features and physical and biological properties with those of the natural α-peptides. De novo design and synthesis of β-amino acids–based oligomers currently are the driving force for the development of new methods allowing preparation of structurally varied, tailor-made β-amino acids. In accord with growing demand for synthetic efficiency and practicality of organic synthesis, many newly developed methods feature operationally convenient conditions and high chemical and stereochemical yields.

An important new addition in the reviews to be presented in the second volume of *Enantioselective Synthesis of β-Amino Acids* is that most contributing authors included some general and practical experimental procedures for the preparation of β-amino acids, according to the particular method described in the chapter. We believe that this combination of comprehensive monograph and guidebook will be attractive to the readers. As was the case in the first volume, most contributions were written by the original developers of these important methods of synthesis.

Of interest to both academic and industrial chemists, introductory overviews on the structural types of relevant β-amino acid targets and on salient β-amino acids present in natural products are followed by a discussion of the most important methods that have been recently developed for the asymmetric synthesis of cyclic and open-chain β-amino acids. Particular attention is given to novel organocatalysts and organometallic catalytic procedures. Also included is a report on the preparation of libraries of enantiopure β-amino acids using combinatorial approaches as well as reviews on the asymmetric synthesis of fluorine-containing and phosphonic analogs.
of β-amino acids. As indicated above, two chapters are dedicated to the synthesis and analysis of the secondary structure and the biological activity of β-peptides.

We hope that the relevance and timeliness of the topics discussed in this book will render it of interest to a broad group of chemists in universities and the pharmaceutical and related industries.

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β-Amino acids, although less abundant than their α-analogues, are also present in peptides and in other natural products, and in free form they show interesting pharmacological effects. Furthermore, β-amino acids are synthetic precursors of β-lactams, which are potentially biologically active and of current interest. Although several methods for the synthesis of racemic β-amino acids have been developed, only recently has the preparation of enantiomerically pure compounds emerged as an important and challenging synthetic endeavor.

Following introductory overviews of the relevance of β-amino acids in pharmaceutical sciences, this book presents a discussion of the most important methods that have been developed for the asymmetric synthesis of β-amino acids. Each important method is described by the original leader chemist who developed it, and thus each chapter is written with authority and firsthand knowledge.

I hope that the relevance and timeliness of the topics discussed in this book—the first comprehensive monograph in the area—will render it of interest to a broad group of chemists in universities and in the pharmaceutical and related industries.

EUSEBIO JUARISTI