Preface

Recent advances in drug discovery have created new, powerful technologies that have a prominent bioinformatic component. One of the chief difficulties in using these technologies is their requirement for interdisciplinary expertise in the physical sciences, life sciences, and/or computer science. As a result, these new methodologies can present a challenge when establishing a research laboratory.

The purpose of *Bioinformatics and Drug Discovery* is to facilitate the employment of these new, powerful technologies in the process of drug discovery. This volume describes the pipeline of methods and techniques that are used in modern drug discovery. These technologies prominently use bioinformatics for analysis of their output. In *Bioinformatics and Drug Discovery*, the systematic process of drug discovery—from gene identification to protein modeling to identification of drug candidates—is described first. The next part of the book focuses on target identification, including microarray analysis and bioinformatic techniques used to analyze genes as potential drug targets. In addition, examples of how this analysis can be used clinically are also described. The latter part of the book discusses protein modeling and cheminformatics, including virtual screening and *in silico* protein design for identification of drug candidates. Because these technologies are just emerging, the authors of each chapter have provided an extended introduction that describes the theory and application of the technology and techniques described. In the second part of each chapter, every effort has been made to incorporate detailed procedures, including software and its use, related to these technologies.

Bioinformatics and Drug Discovery is directed to those interested in the different aspects of drug design that include academicians (biologists, chemists, and biochemists), clinicians, and scientists at pharmaceutical companies. All the chapters in *Bioinformatics and Drug Discovery* have been written by well-established investigators who use the methods on a regular basis. In all, this book is designed to provide readers not only with the planned insightful overview of key topics, but also with the customary ample supply of unfailing reproducible step-by-step procedures for techniques described.

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