

Preface

Introduction to Systems Biology is intended to be an introductory text for undergraduate and graduate students who are interested in comprehensive biological systems. Because genomics, transcriptomics, proteomics, interactomics, metabolomics, phenomics, localizomics, and other omics analyses provide enormous amounts of biological data, systematic instruction on how to use computational methods to explain underlying biological meanings is required to understand the complex biological mechanisms and to build strategies for their application to biological problems.

The book begins with an introductory section on systems biology. The experimental omics tools are briefly described in Part II. Parts III and IV introduce the reader to challenging computational approaches that aid in understanding biological dynamic systems. These last two parts provide ideas for theoretical and modeling optimization in systemic biological researches by presenting most algorithms as implementations, including the up-to-date, full range of bioinformatic programs, as well as illustrating available successful applications.

The authors also intend to provide a broad overview of the field using key examples and typical approaches to experimental design (both wet-lab and computational). The format of this book makes it a great resource book and provides a glimpse of the state-of-the-art technologies in systems biology. I hope that this book presents a clear and intuitive illustration of the topics on biological systemic approaches and further introduces ideal computational methods for the reader's own research.

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