

## COMPUTATIONAL BIOLOGY

The *Computational Biology* series publishes the very latest, high-quality research devoted to specific issues in computer-assisted analysis of biological data. The main emphasis is on current scientific developments and innovative techniques in computational biology (bioinformatics), bringing to light methods from mathematics, statistics and computer science that directly address biological problems currently under investigation.

The series offers publications that present the state-of-the-art regarding the problems in question; show computational biology/bioinformatics methods at work; and finally discuss anticipated demands regarding developments in future methodology. Titles can range from focused monographs, to undergraduate and graduate textbooks, and professional text/reference works.

Navigating safely through a wealth of genome, protein and metabolite information, as well as a host of information processing tools, without getting lost is crucial for successful research in – and teaching of – molecular biology.

This concise, easy-to-follow textbook/guide serves as a valuable introduction to contemporary cell biology for readers and offers insight into the key research directions in the field. It begins with an overview of existing tools for finding, designing and investigating metabolic, genetic, signalling and other network databases. This practical guide then introduces Cell Illustrator®, a software tool for biological pathway modelling and simulation, developed by the authors. In-depth discussion reveals how this tool can be used for creating, analyzing and simulating biological models, thereby explicating and testing current understanding of basic biological processes. Readers do not require prior knowledge of differential equations or programming.

### Features:

- Provides many helpful learning aids, such as detailed examples throughout, and exercises and solutions
- Designed and structured to be part of a semester-long course
- Discusses the computational functionalities required for Systems Biology
- Addresses practical issues surrounding software tools
- Introduces the current big bio-databases such as TRANSPATH® by Biobase, and explains why and how they can be used to develop and support systems biology research
- Includes a CD-ROM containing Cell Illustrator® that allows readers to create highly complex pathways and simulations
- Explains important pathway databases and software tools, together with their related concepts
- Guides the reader to model pathways in a step-by-step and clear manner
- Contains a Foreword written by Professor Andreas Dress, Director CAS-MPG Partner Institute for Computational Biology, Shanghai Institutes for Biological Sciences, Chinese Academy of Sciences

Written for undergraduates, this reader-friendly introduction to the field of Systems Biology offers insight and teaches sound expertise in the subject. It will also prove valuable to graduate students and professionals wishing to develop and support their systems-biology research.

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Foundations of Systems Biology

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# Foundations of Systems Biology

*Using Cell Illustrator and Pathway Databases*

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