Mathematics/Computer Science/Biology

Chapman & Hall/CRC
Mathematical and Computational Biology Series

Kinetic Modelling in Systems Biology

With more and more interest in how components of biological systems interact, it is important to understand the various aspects of systems biology. **Kinetic Modelling in Systems Biology** focuses on one of the main pillars in the future development of systems biology. It explores both the methods and applications of kinetic modelling in this emerging field.

The book introduces the basic biological cellular network concepts in the context of cellular functioning, explains the main aspects of the Edinburgh Pathway Editor (EPE) software package, and discusses the process of constructing and verifying kinetic models. It presents the features, user interface, and examples of DBSolve as well as the principles of modelling individual enzymes and transporters. The authors describe how to construct kinetic models of intracellular systems on the basis of models of individual enzymes. They also illustrate how to apply the principles of kinetic modeling to perform various functions. The final chapter focuses on applications of kinetic modelling in biotechnology and biomedicine.

Encouraging readers to think about future challenges, this book will help them understand the kinetic modelling approach and how to apply it to solve real-life problems.

Features

- Covers model creation techniques, model verification and validation, and simulations and interpretation of biological results
- Describes underlying algorithms for selected reference methods
- Presents several examples of applications, ranging from drug safety mechanisms to multiple target identification analysis to optimization of *E. coli* amino acid biosynthesis
- Includes a CD-ROM with pathway diagrams, model examples, EPE software, and DBSolve installation

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