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Collana	Molecular biology intelligence unit
Altri autori (Persone)	ArjunanSatya Nanda Vel DharPawan K TomitaM <1957-> (Masaru)
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Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Introduction to whole cell modeling / Pawan K. Dhar -- Foundations of E-cell simulation environment architecture / Nathan Addy and Koichi Takahashi -- Distributed cell biology simulations with the E-cell system / Masahiro Sugimoto -- A guide to modeling reaction-diffusion of molecules with the E-cell system / Satya Nanda Vel Arjunan -- A model library of bacterial chemotaxis on E-cell system / Yuri Matsuzaki -- Electrophysiological simulation of developmental changes in action potentials of cardiomyocytes / Hitomi Itoh -- Simulation of human erythrocyte metabolism / Ayako Kinoshita -- Dynamic kinetic modeling of mitochondrial energy metabolism / Katsuyuki Yugi -- A computational model of the hepatic lobule / Yasuhiro Naito -- Decoding the signaling mechanism of toll-like receptor 4 pathways in wild type and knockouts / Kumar Selvarajoo ; Guest editor: Sankar Ghosh -- Modeling of Hsp70-mediated protein refolding / Bin Hu, Matthias P. Mayer, and Masaru Tomita.
Sommario/riassunto	The interdisciplinary field of molecular systems biology aims to understand the behavior and mechanisms of biological processes composed of individual molecular components. As we gain more qualitative and quantitative information of complex intracellular processes, biochemical modeling and simulation become indispensable

not only to uncover the molecular mechanisms of the processes, but to perform useful predictions. To this end, the ECell System, a multialgorithm, multitime-scale object-oriented simulation platform, can be used to construct predictive virtual biological systems. Gene regulatory and biochemical networks that constitute a sub or a whole cellular system can be constructed using the ECell System to perform qualitative and quantitative analyses. The purpose of ECell System: Basic Concepts and Applications is to provide a comprehensive guide for the ECell System version 3 in terms of the software features and its usage. While the publicly available ECell Simulation Environment version 3 User's Manual provides the technical details of model building and scripting, it does not describe some of the underlying concepts of the ECell System. The first part of the book addresses this issue by providing the basic concepts of modeling and simulation with the ECell System.
