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Titolo	Systems Biology : Integrative Biology and Simulation Tools / / edited by Aleš Prokop, Béla Csukás
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Descrizione fisica	1 online resource (568 p.)
Disciplina	570/.1/13 611.018
Soggetti	Medicine Microbial genetics Microbial genomics Computer simulation Biomedical engineering Biomedicine, general Microbial Genetics and Genomics Simulation and Modeling Biomedical Engineering and Bioengineering
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Functional genomics, proteomics, metabolomics and bioinformatics for systems biology -- Comparing biological networks: a survey on graph classifying techniques -- Emergent properties of gene regulatory networks – models and data -- Regulatory crosstalk analysis of biochemical networks in the nucleus accumbens -- Properties of biological networks -- Network analysis for systems biology -- Computational approaches for reconstruction of time-varying biological networks from Omics data -- Probabilistic graphical modeling in systems biology: a framework for integrative approaches -- Innovations of the rule-based modeling approach -- Reproducibility of model-based results in systems biology -- Parameter identifiability and redundancy, with applications to a general class of stochastic carcinogenesis models -- Semantic systems biology: formal knowledge

representation in systems biology for model construction, retrieval, validation and discovery -- Computational infrastructures for data and knowledge management in systems biology -- Computational tools and resources for integrative modeling in systems biology -- Agent-based modeling approaches to multi-scale systems biology: An example agent-based model of acute pulmonary inflammation -- Reconstructing cellular signaling and regulatory networks - an integrative approach for systems-level drug discovery -- A survey of current integrative network algorithms for systems biology -- Direct Computer Mapping based modeling of a multiscale process, involving p53/miR-34a signaling.

Sommario/riassunto

Growth in the pharmaceutical market has slowed down – almost to a standstill. One reason is that governments and other payers are cutting costs in a faltering world economy. But a more fundamental problem is the failure of major companies to discover, develop and market new drugs. Major drugs losing patent protection or being withdrawn from the market are simply not being replaced by new therapies – the pharmaceutical market model is no longer functioning effectively and most pharmaceutical companies are failing to produce the innovation needed for success. This multi-authored new book looks at a vital strategy which can bring innovation to a market in need of new ideas and new products: Systems Biology (SB). Modeling is a significant task of systems biology. SB aims to develop and use efficient algorithms, data structures, visualization and communication tools to orchestrate the integration of large quantities of biological data with the goal of computer modeling. It involves the use of computer simulations of biological systems, such as the networks of metabolites comprise signal transduction pathways and gene regulatory networks to both analyze and visualize the complex connections of these cellular processes. SB involves a series of operational protocols used for performing research, namely a cycle composed of theoretical, analytic or computational modeling to propose specific testable hypotheses about a biological system, experimental validation, and then using the newly acquired quantitative description of cells or cell processes to refine the computational model or theory.