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Altri autori (Enti)	Accademia Nazionale dei Lincei
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Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Systems Biology; Contents; Preface and Commentary; List of Contributors; Part I Biological Basis of Systems Biology; 1 Systems Biology; 1 Introduction; 2 What Is Systems Understanding?; 3 Why Are Biological Systems Different?; 3.1 Biological Complexity; 3.2 Global Properties of Biological Systems; 4 Systems Biology Modeling; 4.1 Network Biology; 4.2 Dynamic Network Models; 4.3 Reaction-Diffusion Models; 4.4 Holism versus Reductionism: The Global Dynamics of Networks; 4.5 Modeling Resources and Standards; 5 Future Prospects of Systems Biology; 5.1 Synthetic Biology 5.2 Conclusions: Where Are We?References; 2 Developmental Cell Biology; 1 Historical Perspective; 1.1 Origins of Cell Biology; 1.2 Origins of Developmental Biology; 1.3 Relationship between Cell and Developmental Biology; 2 Cell Activities Underlying Development; 2.1 Intracellular Signal Transduction; 2.2 Cell Signaling; 2.3 Cell-Cell Interactions; 2.4 Cell-Matrix Interaction; 2.3 Cell-Cell Interactions; 2.4 Cell-Matrix Interaction; 3 Cell Differentiation; 3 Cell Differentiation; 4 The Cell Cycle and Development; 4 The Cell Cycle and Development; 5 Organogenesis; 6 Stem Cells; 5 Organogenesis

6 Stem Cells7 Chimeras; 7 Chimeras; 8 microRNAs (miRNAs); 9 In vitro Fertilization; References; 8 microRNAs (miRNAs); 9 In vitro Fertilization; References; 3 Principles and Applications of Embryogenomics; 3 Principles and Applications of Embryogenomics; 1 Introduction; 1 Introduction; 2 Approaches; 2.1 Overview; 2 Approaches; 2.1 Overview; 2.2 Large-Scale Analysis of Gene Expression at the Transcriptome Level; 2.2 Large-Scale Analysis of Gene Expression at the Transcriptome Level; 2.3 Large-Scale Analysis of Gene Expression at the Proteome Level
2.4 Development and Evolution: Comparative Genomics2.5 Functional Genomics/Large-Scale Manipulation of Expression; 2.6 Computational Approaches; 3 Model Organisms for Embryogenomics; 3.1 Non-Mammalian Animals; 3.2 Mammalian; 3.3 Plants; 3.4 Suitability of Approaches for Particular Model Organisms Applied to the Study of Development; 4 Conclusions; References; 4 Interactome; 1 Introduction; 2 Experimental Techniques for DetectingProtein Interactions; 3 Computational Prediction of Protein Interactions; 3.1 Interaction Prediction from the Gene Patterns Across Genomes
3.2 Predicting Interaction from Sequence Coevolution3.3 Domain Interactions; 3.4 Coexpression Networks; 4 Exploring the Topology of the Interactome; 4.1 Global Properties; 4.2 Network Centrality and Protein Essentiality; 4.3 Network Modules; 4.4 Network Motifs and Related Concepts; 5 Comparing Protein-Protein Interaction Networks; 6 Databases of Protein and Domain Interactions; 7 Applications; 7.1 Predicting Protein Function; 7.2 Application to Human Diseases; 8 Looking Ahead: Towards the Dynamic Interactome; Acknowledgments; References; 5 Protein Abundance Variation; 1 Introduction
2 Biochemical Aspects Affecting Protein Abundance in Prokaryotes

Sommario/riassunto

Systems biology is a relatively new biological study field that focuses on the systematic study of complex interactions in biological systems, thus using a new perspective (integration instead of reduction) to study them. Particularly from year 2000 onwards, the term is used widely in the biosciences, and in a variety of contexts. Systems biology is the study of the interconnected aspect of molecular, cellular, tissue, whole animal and ecological processes, and comprises mathematical and mechanistic studies of dynamical, mesoscopic, open, spatiotemporally defined, nonlinear, complex syste