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| 1. Record Nr.           | UNISA996465443403316                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Autore                  | Luì Jìnhu                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Titolo                  | Modeling and analysis of bio-molecular networks // Jìnhu Luì, Pèi Wáng                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Pubbl/distr/stampa      | Singapore : , : Springer, , [2020]<br>Â©2020                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| ISBN                    | 981-15-9144-X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Edizione                | [1st ed. 2020.]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Descrizione fisica      | 1 online resource (XXI, 464 p. 144 illus., 123 illus. in color.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Disciplina              | 572.8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Soggetti                | Molecular biology - Data processing<br>Computational biology<br>Bioinformatics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Lingua di pubblicazione | Inglese                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Formato                 | Materiale a stampa                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Livello bibliografico   | Monografia                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Nota di contenuto       | 1 Introduction and Preliminaries -- 2 Reconstruction of Bio-molecular Networks -- 3 Modeling and Analysis of Simple Genetic Circuits -- 4 Modeling and Analysis of Coupled Bio-molecular Circuits -- 5 Modeling and Analysis of Large-scale Networks -- 6 Evolutionary Mechanisms of Network Motifs in PPI Networks -- 7 Identifying Important Nodes in Bio-molecular Networks -- 8 Statistical Analysis of Functional Genes in Human PPI Networks -- 9 Data-driven Statistical Approaches for Omics Data Analysis.                                                                                                                                                                                                                                                                                                               |
| Sommario/riassunto      | This book addresses a number of questions from the perspective of complex systems: How can we quantitatively understand the life phenomena? How can we model life systems as complex bio-molecular networks? Are there any methods to clarify the relationships among the structures, dynamics and functions of bio-molecular networks? How can we statistically analyse large-scale bio-molecular networks? Focusing on the modeling and analysis of bio-molecular networks, the book presents various sophisticated mathematical and statistical approaches. The life system can be described using various levels of bio-molecular networks, including gene regulatory networks, and protein-protein interaction networks. It first provides an overview of approaches to reconstruct various bio-molecular networks, and then |

discusses the modeling and dynamical analysis of simple genetic circuits, coupled genetic circuits, middle-sized and large-scale biological networks, clarifying the relationships between the structures, dynamics and functions of the networks covered. In the context of large-scale bio-molecular networks, it introduces a number of statistical methods for exploring important bioinformatics applications, including the identification of significant bio-molecules for network medicine and genetic engineering. Lastly, the book describes various state-of-art statistical methods for analysing omics data generated by high-throughput sequencing. This book is a valuable resource for readers interested in applying systems biology, dynamical systems or complex networks to explore the truth of nature.

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