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Titolo	Dynamics of Mathematical Models in Biology : Bringing Mathematics to Life / / edited by Alessandra Rogato, Valeria Zazzu, Mario Guarracino
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2016
Edizione	[1st ed. 2016.]
Descrizione fisica	1 online resource (XIII, 148 p. 34 illus., 29 illus. in color.)
Disciplina	519
Soggetti	Neural networks (Computer science) Bioinformatics Biomathematics Calculus of variations Computer science - Mathematics Mathematical Models of Cognitive Processes and Neural Networks Computational Biology/Bioinformatics Mathematical and Computational Biology Calculus of Variations and Optimal Control; Optimization Computational Mathematics and Numerical Analysis
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references at the end of each chapters.
Nota di contenuto	Introduction: Mathematical Modeling -- Genome dynamics -- Dynamics of biological networks -- Pattern recognition dynamics -- Dynamics of polymorphisms.
Sommario/riassunto	This volume focuses on contributions from both the mathematics and life science community surrounding the concepts of time and dynamicity of nature, two significant elements which are often overlooked in modeling process to avoid exponential computations. The book is divided into three distinct parts: dynamics of genomes and genetic variation, dynamics of motifs, and dynamics of biological networks. Chapters included in dynamics of genomes and genetic variation analyze the molecular mechanisms and evolutionary processes that shape the structure and function of genomes and those that govern genome dynamics. The dynamics of motifs portion of the

volume provides an overview of current methods for motif searching in DNA, RNA and proteins, a key process to discover emergent properties of cells, tissues, and organisms. The part devoted to the dynamics of biological networks covers networks aptly discusses networks in complex biological functions and activities that interpret processes in cells. Moreover, chapters in this section examine several mathematical models and algorithms available for integration, analysis, and characterization. Once life scientists began to produce experimental data at an unprecedented pace, it become clear that mathematical models were necessary to interpret data, to structure information with the aim to unveil biological mechanisms, discover results, and make predictions. The second annual “Bringing Maths to Life” workshop held in Naples, Italy October 2015, enabled a bi-directional flow of ideas from and international group of mathematicians and biologists. The venue allowed mathematicians to introduce novel algorithms, methods, and software that may be useful to model aspects of life science, and life scientists posed new challenges for mathematicians.