

1. Record Nr.	UNINA9910257408503321
Titolo	Statistical Mechanics of Biocomplexity [[electronic resource]] : Proceedings of the XV Sitges Conference, Held at Sitges, Barcelona, Spain, 8-12 June 1998 // edited by D. Reguera, J.M.G. Vilar, J.M. Rubi
Pubbl/distr/stampa	Berlin, Heidelberg : , : Springer Berlin Heidelberg : , : Imprint : Springer, , 1999
ISBN	3-540-48486-8
Edizione	[1st ed. 1999.]
Descrizione fisica	1 online resource (XII, 320 p.)
Collana	Lecture Notes in Physics, , 0075-8450 ; ; 527
Disciplina	570/.1/53013
Soggetti	Biophysics Statistical physics Dynamics Biomathematics Condensed matter Biological and Medical Physics, Biophysics Complex Systems Mathematical and Computational Biology Condensed Matter Physics Statistical Physics and Dynamical Systems
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Bibliographic Level Mode of Issuance: Monograph
Nota di contenuto	From membranes to membrane machines -- 'Sausage string' patterns in blood vessels at high blood pressures -- Phase transitions in mesoscopic spherical membranes -- Modeling microtubule oscillations [1] -- Designing RNA folding cooperativity -- Scaling laws for protein folding -- Self-organizing networks of molecular machines in allosterically regulated enzymic reactions -- Coupled Brownian motors -- On the role of molecular machines in the origin of the genetic code -- Population dynamics and non-Hermitian localization -- Collective motion -- A population dynamics approach to biological aging -- Small-world networks -- Extended mean-field theory for networks of spiking neurons -- Pattern formation in the developing visual cortex: Topological defects, their generation, motion, and annihilation --

Complex spiking behavior from noise-driven neuron interaction -- A new nonlinear model for pitch perception -- Statistical mechanics of network models of macroevolution and extinction -- Exact analytical results in a simple model of self-organized biological evolution -- Transition to chaos in models of genetic networks.

Sommario/riassunto

This book demonstrates the usefulness of tools from statistical mechanics for biology. It includes the new tendencies in topics like membranes, vesicles, microtubules, molecular motors, DNA, protein folding, phase transitions in biological systems, evolution, population dynamics, neural systems and biological oscillators, with special emphasis on the importance of statistical mechanics in their development. The book addresses researchers and graduate students.
