

1. Record Nr.	UNINA9910458719103321
Titolo	From molecules to networks [[electronic resource]] : an introduction to cellular and molecular neuroscience // edited by John H. Byrne, James L. Roberts
Pubbl/distr/stampa	Amsterdam ; ; Boston, : Elsevier Academic Press, c2004
ISBN	1-281-00500-2 9786611005009 0-08-049135-9
Descrizione fisica	1 online resource (599 p.)
Altri autori (Persone)	ByrneJohn H RobertsJames Lewis <1951->
Disciplina	611/.0188
Soggetti	Molecular neurobiology Cytology Neurons Electronic books.
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	Front Cover; From Molecules to Networks: An Introduction to Cellular and Molecular Neuroscience; Copyright Page; Full Contents; Contributors; Preface; Chapter 1. Cellular Components of Nervous Tissue; The Neuron; The Neuroglia; The Cerebral Vasculature; Chapter 2. Subcellular Organization of the Nervous System: Organelles and Their Functions; Axons and Dendrites: Unique Structural Components of Neurons; Protein Synthesis in Nervous Tissue; The Cytoskeletons of Neurons and Glial Cells; Molecular Motors in the Nervous System; Building and Maintaining Nervous System Cells Chapter 3. Brain Energy MetabolismEnergy Metabolism of the Brain as a Whole Organ; Tight Coupling of Neuronal Activity, Blood Flow, and Energy Metabolism; Energy-Producing and Energy-Consuming Processes in the Brain; Brain Energy Metabolism at the Cellular Level; Glutamate and Nitrogen Metabolism: A Coordinated Shuttle Between Astrocytes and Neurons; The Astrocyte-Neuron Metabolic Unit; Chapter 4. Electrotonic Properties of Axons and Dendrites; Spread of Steady-

State Signals; Spread of Transient Signals; Electrotonic Properties Underlying Propagation in Axons; Electrotonic Spread in Dendrites Dynamic Properties of Passive Electrotonic Structure Relating Passive to Active Potentials; Chapter 5. Membrane Potential and Action Potential; The Membrane Potential; The Action Potential; Chapter 6. Molecular Properties of Ion Channels; Families of Ion Channels; Channel Gating; Ion Permeation; Ion Channel Distribution; Summary; Chapter 7. Dynamical Properties of Excitable Membranes; The Hodgkin-Huxley Model; A Geometric Analysis of Excitability; Chapter 8. Release of Neurotransmitters; Organization of the Chemical Synapse; Excitation-Secretion Coupling
The Molecular Mechanisms of the Nerve Terminal Quantal Analysis; Short-Term Synaptic Plasticity; Chapter 9. Pharmacology and Biochemistry of Synaptic Transmission: Classic Transmitters; Diverse Modes of Neuronal Communication; Chemical Transmission; Classic Neurotransmitters; Summary; Chapter 10. Nonclassic Signaling in the Brain; Peptide Neurotransmitters; Neurotensin as an Example of Peptide Neurotransmitters; Unconventional Transmitters; Synaptic Transmitters in Perspective; Chapter 11. Neurotransmitter Receptors; Ionotropic Receptors; G Protein-Coupled Receptors
Chapter 12. Intracellular Signaling Signaling Through G-Protein-Linked Receptors; Modulation of Neuronal Function by Protein Kinases and Phosphatases; Chapter 13. Regulation of Neuronal Gene Expression and Protein Synthesis; Intracellular Signaling Affects Nuclear Gene Expression; Role of cAMP and Ca²⁺ in the Activation Pathways of Transcription; Summary; Chapter 14. Mathematical Modeling and Analysis of Intracellular Signaling Pathways; Methods for Modelling Intracellular Signaling Pathways; General Issues in the Modeling of Biochemical Systems; Specific Modeling Methods; Summary
Chapter 15. Cell-Cell Communication: An Overview Emphasizing Gap Junctions

Sommario/riassunto

An understanding of the nervous system at virtually any level of analysis requires an understanding of its basic building block, the neuron. This book provides the solid foundation of the morphological, biochemical, and biophysical properties of nerve cells that is needed by advanced undergraduates and graduate students, as well as researchers in need of a thorough reference.* Highly referenced for readers to pursue topics of interest in greater detail* Unique coverage of the application of mathematical modeling and simulation approaches not found in other textbooks* Richly ill
