1. Record Nr. UNINA9910146126403321 Matthews Gary G. <1949-> Autore Titolo Cellular physiology of nerve and muscle / / Gary G. Matthews Pubbl/distr/stampa Osney Mead, Oxford; Malden, MA, Blackwell Pub., c2003 **ISBN** 1-118-68787-6 1-118-68786-8 1-282-11755-6 9786612117558 1-4443-1130-1 Edizione [4th ed.] Descrizione fisica 1 online resource (250 p.) Disciplina 573.8/36 Soggetti Neurons Muscle cells Nerves - Cytology Muscles - Cytology 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 (p. [225]-229) and index. Nota di contenuto Cellular Physiology of Nerve and Muscle; Contents; Preface to the Fourth Edition: Acknowledgments: Part II Origin of Electrical Membrane Potential: 1 Introduction to Electrical Signaling in the Nervous System: The Patellar Reflex as a Model for Neural Function; The Cellular Organization of Neurons: Electrical Signals in Neurons: Transmission between Neurons; 2 Composition of Intracellular and Extracellular Fluids: Intracellular and Extracellular Fluids: The Structure of the Plasma Membrane: Summary: 3 Maintenance of Cell Volume: Molarity, Molality, and Diffusion of Water Osmotic Balance and Cell VolumeAnswers to the Problem of Osmotic Balance; Tonicity; Time-course of Volume Changes; Summary; 4 Membrane Potential: Ionic Equilibrium: Diffusion Potential: Equilibrium Potential; The Nernst Equation; The Principle of Electrical Neutrality; The Cell Membrane as an Electrical Capacitor; Incorporating Osmotic Balance; Donnan Equilibrium; A Model Cell that Looks Like a Real

Animal Cell; The Sodium Pump; Summary; 5 Membrane Potential: Ionic

Steady State; Equilibrium Potentials for Sodium, Potassium, and

Chloride; Ion Channels in the Plasma Membrane

Membrane Potential and Ionic PermeabilityThe Goldman Equation; Ionic Steady State; The Chloride Pump; Electrical Current and the Movement of Ions Across Membranes; Factors Affecting Ion Current Across a Cell Membrane; Membrane Permeability vs. Membrane Conductance; Behavior of Single Ion Channels; Summary; Part II Cellular Physiology of Nerve Cells: 6 Generation of Nerve Action Potential: The Action Potential: Ionic Permeability and Membrane Potential: Measuring the Long-distance Signal in Neurons; Characteristics of the Action Potential; Initiation and Propagation of Action Potentials Changes in Relative Sodium Permeability During an Action PotentialVoltage-dependent Sodium Channels of the Neuron Membrane; Repolarization; The Refractory Period; Propagation of an Action Potential Along a Nerve Fiber; Factors Affecting the Speed of Action Potential Propagation; Molecular Properties of the Voltagesensitive Sodium Channel; Molecular Properties of Voltage-dependent Potassium Channels: Calcium-dependent Action Potentials: Summary: 7 The Action Potential: Voltage-clamp Experiments; The Voltage Clamp; Measuring Changes in Membrane Ionic Conductance Using the Voltage

The Squid Giant Axonlonic Currents Across an Axon Membrane Under Voltage Clamp; The Gated Ion Channel Model; Membrane Potential and Peak Ionic Conductance; Kinetics of the Change in Ionic Conductance Following a Step Depolarization; Sodium Inactivation; The Temporal Behavior of Sodium and Potassium Conductance; Gating Currents; Summary; 8 Synaptic Transmission at the Neuromuscular Junction; Chemical and Electrical Synapses; The Neuromuscular Junction as a Model Chemical Synapse; Transmission at a Chemical Synapse; Presynaptic Action Potential and Acetylcholine Release Effect of Acetylcholine on the Muscle Cell

Sommario/riassunto

Cellular Physiology of Nerve and Muscle, Fourth Edition offers a state of the art introduction to the basic physical, electrical and chemical principles central to the function of nerve and muscle cells. The text begins with an overview of the origin of electrical membrane potential, then clearly illustrates the cellular physiology of nerve cells and muscle cells. Throughout, this new edition simplifies difficult concepts with accessible models and straightforward descriptions of experimental results. An all-new introduction to electrical signaling in the nervous system.