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Nota di contenuto

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Osmotic Balance and Cell Volume
Answers 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 Permeability
The 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 Potential
Voltage-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 Voltage-sensitive 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 Clamp
The Squid Giant Axon
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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.

