1. Record Nr. UNINA9910144008403321

Titolo	Molecular system bioenergetics [[electronic resource]] : energy for life / / edited by Valdur Saks
Pubbl/distr/stampa	Weinheim, : Wiley-VCH, c2007
ISBN	1-281-31182-0 9786611311827 3-527-62109-1 3-527-62110-5
Descrizione fisica	1 online resource (635 p.)
Altri autori (Persone)	SaksV. A
Disciplina	572.431
Soggetti	Bioenergetics Cell metabolism Energy metabolism 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	Molecular System Bioenergetics; Contents; Preface; List of Contributors; Introduction: From the Discovery of Biological Oxidation to Molecular System Bioenergetics; References; Part I Molecular System Bioenergetics: Basic Principles, Organization, and Dynamics of Cellular Energetics; 1 Cellular Energy Metabolism and Integrated Oxidative Phosphorylation; Abstract; 1.1 Introduction; 1.2 Membrane Transport and Initial Activation; 1.3 Cytosolic Pathway; 1.4 Mitochondrial Transport and Metabolism; 1.5 Respiratory Chain and Oxidative Phosphorylation; 1.6 Electron Supply 1.7 Reducing Power Shuttling Across the Mitochondrial Membrane1.8 Electron Transfer in the Respiratory Chain: Prominent Role of Complex I in the Regulation of the Nature of Substrate; 1.9 Modulation of Oxidative Phosphorylation by Respiratory Chain Slipping and Proton Leak; 1.10 The Nature of Cellular Substrates Interferes with the Metabolic Consequences of Uncoupling; 1.11 Dynamic Supramolecular Arrangement of Respiratory Chain and Regulation of Oxidative Phosphorylation; References; 2 Organization and Regulation of

Mitochondrial Oxidative Phosphorylation; Abstract; 2.1 Introduction
2.2 Oxidative Phosphorylation and the Chemiosmotic Theory2.3 The Various Mechanisms of Energy Waste; 2.3.1 Passive Leak; 2.3.2 Leak Catalyzed by Uncoupling Proteins; 2.3.3 The Active Leak; 2.3.4 The Slipping Mechanism; 2.4 Mechanisms of Coupling in Proton Pumps; 2.5 Oxidative Phosphorylation Control and Regulation; 2.5.1 Metabolic Control Analysis; 2.5.2 Regulations; 2.5.2.1 Kinetic Regulation of Mitochondrial Oxidative Phosphorylation: Complex I Covalent cAMP-dependent Phosphorylation; 2.5.2.2 Cytochrome Oxidase: An Example of Coordinate Regulation
2.6 Supramolecular Organization of the Respiratory Chain2.6.1 Structural Data; 2.6.1.1 ATP Synthase Organization; 2.6.1.2 Respiratory Chain Supramolecular Organization; 2.6.2 Functional Data; 2.7 Conclusions; References; 3 Integrated and Organized Cellular Energetic Systems: Theories of Cell Energetics, Compartmentation, and Metabolic Channeling; Abstract; 3.1 Introduction; 3.2 Theoretical Basis of Cellular Metabolism and Bioenergetics; 3.2.1 Thermodynamic Laws, Energy Metabolism, and Cellular Organization
3.2.2 Chemical and Electrochemical Potentials: Energy of Transmembrane Transport and Metabolic Reactions3.2.3 Non-equilibrium, Steady-state Conditions; 3.2.4 Free Energy Changes and the Problem of Intracellular Organization of Metabolism; 3.2.5 Macromolecular Crowding, Heterogeneity of Diffusion, Compartmentation, and Vectorial Metabolism; 3.2.5.1 Heterogeneity of Intracellular Diffusion and Metabolic Channeling; 3.2.5.2 Compartmentation Phenomenon and Vectorial Metabolism; 3.3 Compartmentalized Energy Transfer and Metabolic Sensing
3.3.1 Compartmentation of Adenine Nucleotides in Cardiac Cells

Sommario/riassunto

In this first integrated view, practically each of the world's leading experts has contributed to this one and only authoritative resource on the topic. Bringing systems biology to cellular energetics, they address in detail such novel concepts as metabolite channeling and medical aspects of metabolic syndrome and cancer.