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Nota di contenuto	Biomolecular Information Processing; Contents; Preface; List of Contributors; 1 Biomolecular Computing: From Unconventional Computing to "Smart" Biosensors and Actuators - Editorial Introduction; References; 2 Peptide-Based Computation: Switches, Gates, and Simple Arithmetic; 2.1 Introduction; 2.2 Peptide-Based Replication Networks; 2.2.1 Template-Assisted Replication; 2.2.2 Theoretical Prediction of the Network Connectivity; 2.2.3 De novo Designed Synthetic Networks; 2.3 Logic Gates within Ternary Networks; 2.3.1 Uniform Design Principles of All Two-Input Gates; 2.3.2 OR Logic 2.3.3 AND Logic 2.3.4 NAND Logic; 2.3.5 XOR Logic; 2.4 Symmetry and Order Requirements for Constructing the Logic Gates; 2.4.1 Symmetry and Order in Peptide-Based Catalytic Networks; 2.4.2 How Symmetry and Order Affect the Replication of RNA Quasispecies; 2.5 Taking the Steps toward More Complex Arithmetic; 2.5.1 Arithmetic Units; 2.5.2 Network Motifs; 2.6 Experimental Logic Gates; 2.6.1 OR Logic; 2.6.2 NOT, NOR, and NOTIF Logic; 2.6.3 Additional Logic Operations; 2.7 Adaptive Networks; 2.7.1 Chemical Triggering; 2.7.2 Light Triggering; 2.7.3 Light-Induced Logic Operations 2.8 Peptide-Based Switches and Gates for Molecular Electronics 2.9

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3.5 Three-Dimensional Optical Memories 3.5.1 Write, Read, and Erase Operations; 3.5.2 Efficient Algorithms for Data Processing; 3.5.3 Multiplexing and Error Analysis; 3.6 Genetic Engineering of Bacteriorhodopsin for Device Applications; 3.7 Future Directions; Acknowledgments; References; 4 Bioelectronic Devices Controlled by Enzyme-Based Information Processing Systems; 4.1 Introduction; 4.2 Enzyme-Based Logic Systems Producing pH Changes as Output Signals; 4.3 Interfacing of the Enzyme Logic Systems with Electrodes Modified with Signal-Responsive Polymers
4.4 Switchable Biofuel Cells Controlled by the Enzyme Logic Systems
4.5 Biomolecular Logic Systems Composed of Biocatalytic and Biorecognition Units and Their Integration with Biofuel Cells; 4.6 Processing of Injury Biomarkers by Enzyme Logic Systems Associated with Switchable Electrodes; 4.7 Summary and Outlook; Acknowledgments; References; 5 Enzyme Logic Digital Biosensors for Biomedical Applications; 5.1 Introduction; 5.2 Enzyme-Based Logic Systems for Identification of Injury Conditions; 5.3 Multiplexing of Injury Codes for the Parallel Operation of Enzyme Logic Gates
5.4 Scaling Up the Complexity of the Biocomputing Systems for Biomedical Applications - Mimicking Biochemical Pathways

Sommario/riassunto

Edited by a renowned and much cited chemist, this book covers the whole span of molecular computers that are based on biomolecules. The contributions by all the major scientists in the field provide an excellent overview of the latest developments in this rapidly expanding area. A must-have for all researchers working on this very hot topic. Perfectly complements Molecular and Supramolecular Information Processing, also by Prof. Katz, and available as a two-volume set.
