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Verification and Testing Based on P Systems -- A Look Back at Some Early Results in Membrane Computing -- From P to MP Systems -- The Biological Cell in Spectacle -- Energy-Based Models of P Systems -- A Computational Complexity Theory in Membrane Computing -- Regular Presentations -- Evolving by Maximizing the Number of Rules: Complexity Study -- On Reversibility and Determinism in P Systems -- Typed Membrane Systems -- A P System Based Model of an Ecosystem of Some Scavenger Birds -- Metabolic P System Flux Regulation by Artificial Neural Networks -- A Novel Variant of P Systems for the Modelling and Simulation of Biochemical Systems -- Implementing P Systems Parallelism by Means of GPUs -- Regulation and Covering Problems in MP Systems -- (Tissue) P Systems with Hybrid Transition Modes -- An Overview of P-Lingua 2.0 -- Characterizing Tractability by Tissue-Like P Systems -- Searching Previous Configurations in Membrane Computing -- Modelling Signalling Networks with Incomplete Information about Protein Activation States: A P System Framework of the KaiABC Oscillator -- Solving NP-Complete Problems by Spiking Neural P Systems with Budding Rules -- Tuning P Systems for Solving the Broadcasting Problem -- An Improved Membrane Algorithm for Solving Time-Frequency Atom Decomposition -- A Region-Oriented Hardware Implementation for Membrane Computing Applications -- Discovering the Membrane Topology of Hyperdag P Systems -- A Note on Small Universal Spiking Neural P Systems -- On the Power of Computing with Proteins on Membranes -- An EfficientSimulation of Polynomial-Space Turing Machines by P Systems with Active Membranes -- Look-Ahead Evolution for P Systems.

Sommario/riassunto

This book constitutes the thoroughly refereed post-workshop proceedings of the 10th International Workshop on Membrane Computing, WMC 2009, held in Curtea de Arges, Romania, during August 24 to 27, 2009 under the auspices of the European Molecular Computing Consortium (EMCC) and the Molecular Computing Task Force of IEEE Computational Intelligence Society. The 22 revised full papers presented together with 10 invited papers went through two rounds of reviewing and improvement. The papers in this volume cover all the main directions of research in membrane computing, ranging from theoretical topics in mathematics and computer science to application issues; the invited lectures present fundamental contributions to membrane computing; thus highlighting important directions of current research in this area.