
Contents

1. Introduction to Membrane Computing
Gheorghe Păun 1

Bio-applications

2. P System Models for Mechanosensitive Channels
*Ioan I. Ardelean, Daniela Besozzi, Max H. Garzon,
Giancarlo Mauri, Sujoy Roy* 43
3. P Systems for Biological Dynamics
*Luca Bianco, Federico Fontana,
Giuditta Franco, Vincenzo Manca* 83
4. Modeling Respiration in Bacteria and Respiration/Photosynthesis
Interaction in Cyanobacteria Using a P System Simulator
Matteo Cavaliere, Ioan I. Ardelean 129
5. Modeling Cell-Mediated Immunity by Means of P Systems
Gabriel Ciobanu 159
6. A Membrane Computing Model of Photosynthesis
Taishin Yasunobu Nishida 181
7. Modeling p53 Signaling Pathways by Using Multiset Processing
Yasuhiro Suzuki, Hiroshi Tanaka..... 203

Computer Science Applications

8. Static Sorting P Systems
Artiom Alhazov, Dragoş Sburlan 215

9. Membrane-Based Devices Used in Computer Graphics <i>Alexandros Georgiou, Marian Gheorghe, Francesco Bernardini</i>	253
10. An Analysis of a Public Key Protocol with Membranes <i>Olivier Michel, Florent Jacquemard</i>	283
11. Membrane Algorithms: Approximate Algorithms for NP -Complete Optimization Problems <i>Taishin Yasunobu Nishida</i>	303
12. Computationally Hard Problems Addressed Through P Systems <i>Mario J. Pérez-Jiménez, Alvaro Romero-Jiménez, Fernando Sancho-Caparrini</i>	315
Applications to Linguistics	
13. Linguistic Membrane Systems and Applications <i>Gemma Bel Enguix, María Dolores Jiménez-Lopez</i>	347
14. Parsing with P Automata <i>Radu Gramatovici, Gemma Bel Enguix</i>	389
Membrane Software	
15. Available Membrane Computing Software <i>Miguel Angel Gutiérrez-Naranjo, Mario J. Pérez-Jiménez, Agustín Riscos-Núñez</i>	411
Selective Bibliography of Membrane Computing	437