
Contents

1. Introduction to Membrane Computing	
<i>Gheorghe Păun</i>	1
Bio-Applications	
2. P System Models for Mechanosensitive Channels	
<i>Ioan I. Ardelean, Daniela Besozzi, Max H. Garzon,</i> <i>Giancarlo Mauri, Sujoy Roy</i>	43
3. P Systems for Biological Dynamics	
<i>Luca Bianco, Federico Fontana,</i> <i>Giuditta Franco, Vincenzo Manca</i>	81
4. modeling Respiration in Bacteria and Respiration/Photosynthesis Interaction in Cyanobacteria by Using a P System Simulator	
<i>Matteo Cavaliere, Ioan I. Ardelean</i>	127
5. modeling Cell-Mediated Immunity by Means of P Systems	
<i>Gabriel Ciobanu</i>	157
6. A Membrane Computing Model of Photosynthesis	
<i>Taishin Yasunobu Nishida</i>	179
7. modeling p53 Signaling Pathways by Using Multiset Processing	
<i>Yasuhiro Suzuki, Hiroshi Tanaka</i>	201
Computer Science Applications	
8. Static Sorting P Systems	
<i>Artiom Alhazov, Dragoş Sburlan</i>	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>	281
11. Membrane Algorithms: Approximate Algorithms for NP-Complete Optimization Problems <i>Taishin Yasunobu Nishida</i>	301
12. Computationally Hard Problems Addressed Through P Systems <i>Mario J. Pérez–Jiménez, Alvaro Romero–Jiménez, Fernando Sancho–Caparrini</i>	313
Applications to Linguistics	
13. Linguistic Membrane Systems and Applications <i>Gemma Bel Enguix, Maria 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	439