
Contents

<i>Preface</i>	<i>v</i>
<i>Contributors</i>	<i>ix</i>
PART I SINGLE MOLECULE CHARACTERIZATION WITH BIOLOGICAL NANOPORES	
1 Detecting and Characterizing Individual Molecules with Single Nanopores	3
<i>John J. Kasianowicz, Joseph E. Reiner, Joseph W.F. Robertson, Sarah E. Henrickson, Claudio Rodrigues, and Oleg V. Krasilnikov</i>	
2 Protein Sensing with Engineered Protein Nanopores	21
<i>Mohammad M. Mohammad and Liviu Movileanu</i>	
3 Measurements of DNA Immobilized in the Alpha-Hemolysin Nanopore	39
<i>Robert Purnell and Jacob Schmidt</i>	
4 DNA Unzipping and Protein Unfolding Using Nanopores	55
<i>Céline Merstorf, Benjamin Cressiot, Manuela Pastoriza-Gallego, Abdel Ghani Oukhaled, Laurent Bacri, Jacques Gierak, Juan Pelta, Loïc Auvray, and Jérôme Mathé</i>	
PART II BIOMOLECULE CHARACTERIZATION WITH ARTIFICIAL MEMBRANES	
5 DNA Characterization with Ion Beam-Sculpted Silicon Nitride Nanopores	79
<i>Ryan C. Rollings, David S. McNabb, and Jiali Li</i>	
6 DNA Sequencing by Nanopore-Induced Photon Emission	99
<i>Alon Singer, Ben McNally, Ruby Dela Torre, and Amit Meller</i>	
7 Optical Tweezers for Mechanical Control Over DNA in a Nanopore	115
<i>Ulrich F. Keyser</i>	
8 Analyzing Single DNA Molecules by Nanopore Translocation	135
<i>Lorenz J. Steinbock and Ulrich F. Keyser</i>	
PART III THEORY AND COMPUTER SIMULATIONS FOR SINGLE MOLECULE CHARACTERIZATION WITH PROTEIN AND SOLID-STATE NANOCHANNELS	
9 DNA Characterization by Transverse Electrical Current in a Nanochannel	149
<i>Massimiliano Di Ventra, Matt Krems, James Wilson, and Yuriy V. Pershin</i>	
10 Optimization of the Molecular Dynamics Method for Simulations of DNA and Ion Transport Through Biological Nanopores	165
<i>David B. Wells, Swati Bhattacharya, Rogan Carr, Christopher Maffeo, Anthony Ho, Jeffrey Comer, and Aleksei Aksimentiev</i>	

11 Polymer Translocation Through an Electrically Tunable Nanopore
in a Multilayered Semiconductor Membrane 187
*Dmitriy V. Melnikov, Alexey Nikolaev, Jean-Pierre Leburton,
and Maria E. Gracheva*

PART IV NOVEL MATERIALS AND DEVICES FOR BIOMOLECULAR
CHARACTERIZATION

12 Graphene Nanopore Devices for DNA Sensing 211
Chris A. Merchant and Marija Drndić

13 Measuring Single-Wall Carbon Nanotubes with Solid-State Nanopores 227
*Adam R. Hall, Johannes M. Keegstra, Matthew C. Duch,
Mark C. Hersam, and Cees Dekker*

14 Passive and Electrically Actuated Solid-State Nanopores for Sensing
and Manipulating DNA 241
Zhijun Jiang, Mirna Mihovilovic, Erin Teich, and Derek Stein

Index 265



<http://www.springer.com/978-1-61779-772-9>

Nanopore-Based Technology

Gracheva, M.E. (Ed.)

2012, XI, 267 p., Hardcover

ISBN: 978-1-61779-772-9

A product of Humana Press