

# Contents

Preface .....	v
Contributors.....	xi

## PART I IMAGING

1 Artifacts and Practical Issues in Atomic Force Microscopy..... <i>Peter Eaton and Krystallenia Batziou</i>	3
2 Quantitative Analysis of Structure and Dynamics in AFM Images of Lipid Membranes..... <i>Simon D. Connell, George R. Heath, and James A. Goodchild</i>	29
3 Imaging Artificial Membranes Using High-Speed Atomic Force Microscopy ..... <i>Hussein Nasrallah, Anthony Vial, Nicolas Pocholle, Jérémie Soulier, Luca Costa, Cédric Godefroy, Eric Bourillot, Eric Lesniewska, and Pierre-Emmanuel Milhiet</i>	45
4 Investigating the Nanodomain Organization of Rhodopsin in Native Membranes by Atomic Force Microscopy ..... <i>Subhadip Senapati and Paul S.-H. Park</i>	61
5 Analysis of DNA–Protein Complexes by Atomic Force Microscopy Imaging: The Case of TRF2–Telomeric DNA Wrapping ..... <i>Sabrina Pisano and Eric Gilson</i>	75
6 Cell Topography and Its Quantitative Imaging by AFM ..... <i>Jiang Pi and Jiye Cai</i>	99

## PART II SINGLE-MOLECULE FORCE SPECTROSCOPY

7 Functionalization of AFM Tips and Supports for Molecular Recognition Force Spectroscopy and Recognition Imaging ..... <i>A. Ebner, L. Wildling, and H. J. Gruber</i>	117
8 Ligand-Receptor Binding on Cell Membrane: Dynamic Force Spectroscopy Applications ..... <i>Jianli Liu, Wenhui Li, Xuejie Zhang, Yan Feng, and Xiaohong Fang</i>	153
9 Single-Molecule Force Spectroscopy: Experiments, Analysis, and Simulations..... <i>Fidan Sumbul and Felix Rico</i>	163
10 AFM to Study Pore-Forming Proteins..... <i>Joseph D. Unsay and Ana J. García-Sáez</i>	191
11 Imaging and Manipulation of Extracellular Traps by Atomic Force Microscopy..... <i>Ricardo H. Pires, Mihaela Delcea, and Stephan B. Felix</i>	203

**PART III STUDIES OF BACTERIA AND VIRUS IN AFM**

12	Investigation of Bacterial Curli Production and Adhesion Using AFM .....	221
	<i>Yoo Jin Oh and Peter Hinterdorfer</i>	
13	Antimicrobial Peptides: Effect on Bacterial Cells .....	233
	<i>Marco M. Domingues, Mário R. Felício, and Sónia Gonçalves</i>	
14	AFM Nanindentation Experiments on Protein Shells: A Protocol .....	243
	<i>Tukun Guo and Wouter H. Roos</i>	
15	Structural and Mechanical Characterization of Viruses with AFM .....	259
	<i>Álvaro Ortega-Estebar, Natália Martín-González, Francisco Moreno-Madrid, Aida Llauro, Mercedes Hernando-Pérez, Carmen San Martín, and Pedro J. de Pablo</i>	

**PART IV AFM ELASTICITY STUDIES**

16	Quantification of the Elastic Properties of Soft and Sticky Materials Using AFM .....	281
	<i>Nicolas Bouchonville and Alice Nicolas</i>	
17	Measuring the Elastic Properties of Living Cells .....	291
	<i>Hermann Schillers</i>	
18	Measuring Elastic Properties of Single Cancer Cells by AFM .....	315
	<i>Małgorzata Lekka and Joanna Pabijan</i>	

**PART V AFM APPLICATIONS IN NANOMEDICINE**

19	Molecular Recognition Force Spectroscopy for Probing Cell Targeted Nanoparticles In Vitro .....	327
	<i>Carla P. Gomes, Hugo Oliveira, Andreas Ebner, Peter Hinterdorfer, and Ana P. Pégo</i>	
20	Biomechanical Characterization of Human Pluripotent Stem Cell-Derived Cardiomyocytes by Use of Atomic Force Microscopy .....	343
	<i>Jan Pribyl, Martin Pešl, Guido Caluori, Ivana Acimovic, Sarka Jelinkova, Petr Dvorak, Petr Skladal, and Vladimír Rotrekl</i>	
21	Simultaneous AFM Investigation of the Single Cardiomyocyte Electro-Chemo-Mechanics During Excitation-Contraction Coupling .....	355
	<i>Guido Caluori, Roberto Raiteri, and Mariateresa Tedesco</i>	

<i>Index</i> .....	369
--------------------	-----