Contents

Part I Binding DNA and Changing its Shape

1 Introduction to Biophysics of DNA–Protein Interactions: From Single Molecules to Biological Systems.....	3
Mark C. Williams and L. James Maher, III	
2 Single-Molecule Imaging of LacI Diffusing Along Nonspecific DNA	9
Y.M. Wang and R.H. Austin	
3 How Proteins Slide on DNA	39
Daniel Barsky, Ted A. Laurence, and Česlovas Venclovas	
4 Role of DNA Conformations in Gene Regulation	69
Ralf Metzler, Bram van den Broek, Gijs J.L. Wuite, and Michael A. Lomholt	
5 Recognition of Nucleic Acids by Transcription Factor NF-κB	85
Gourisankar Ghosh, De-Bin Huang, and Tom Huxford	
6 Dynamics and Mechanism of DNA-Bending Proteins in Binding Site Recognition.....	107
Anjum Ansari and Serguei V. Kuznetsov	
7 Studies of Sequence-Nonspecific HMGB DNA-Binding Proteins.....	143
L. James Maher, III	
8 DNA Interactions with Single-Stranded DNA Binding Proteins and Retroviral Nucleic Acid Chaperones by Force Spectroscopy	163
Mark C. Williams and Ioulia Rouzina	

Part II Complex Protein-DNA Interactions

9	DNA Looping in Prophage Lambda: New Insight from Single-Molecule Microscopy	193
	Laura Finzi, Carlo Manzo, Chiara Zurla, Haowei Wang, Dale Lewis, Sankar Adhya, and David Dunlap	
10	Dynamics of Protein–ssDNA Interactions in the Bacteriophage T4 Homologous Recombination System	213
	Jie Liu and Scott W. Morrical	
11	Polymerase Switching in Response to DNA Damage.....	241
	Jaylene N. Ollivierre, Michelle C. Silva, Jana Sefcikova, and Penny J. Beuning	
12	Topological Probes of a Cooperative, Nonspecific Protein–DNA Complex	293
	Claire A. Adams, Manana Melikishvili, and Michael G. Fried	
13	How to Think Like a Single Molecule: Obtaining Quantitative Measurements on Single DNA Molecules and Chromatin Fibers	307
	Sanford H. Leuba and Richard A. Steinman	
14	Long-Range Chromatin Interactions in Cells	325
	Guo Ling Zhou, Li Xin, and De Pei Liu	
	Index.....	341