

CONTENTS

CONTRIBUTORS xi

PREFACE xiii

I CELL-SUBSTRATE ADHESION I

1 Traction Forces Exerted by Adherent Cells 3

CYNTHIA A. REINHART-KING AND DANIEL A. HAMMER

2 Control of Endothelial Cell Adhesion by Mechanotransmission from Cytoskeleton to Substrate 25

ROSALIND E. MOTT AND BRIAN P. HELMKE

3 Use of Hydrodynamic Shear Stress to Analyze Cell Adhesion 51

DAVID BOETTIGER

4 Cellular Tensegrity Models and Cell-Substrate Interactions 81

DIMITRIJE STAMENOVIĆ, NING WANG, AND DONALD E. INGBER

II PHYSICAL CHEMISTRY OF THE CELL SURFACE 103**5 Bond Formation During Cell Compression 105**

ELENA LOMAKINA AND RICHARD E. WAUGH

6 Dynamics of the Neutrophil Surface During Emigration from Blood 123

THOMAS R. GABORSKI AND JAMES L. MCGRATH

7 Glycocalyx Regulation of Cell Adhesion 143

PHILIPPE ROBERT, LAURENT LIMOZIN, ANNE-MARIE BENOLIEL, ANNE PIERRES, AND PIERRE BONGRAND

III ENGINEERED BIOMIMETIC SURFACES 171**8 Atomistic Modeling of Protein Adsorption to Ceramic Biomaterials in Water: A First Step Toward Realistic Simulation of the Biomaterials Surface *In Vivo* 173**

ALAN H. GOLDSTEIN

9 Model Cell Membrane Surfaces for Measuring Receptor–Ligand Interactions 195

CRAIG D. BLANCHETTE, TIMOTHY V. RATTO, AND MARJORIE L. LONGO

10 A Flow Chamber for Capillary Networks: Leukocyte Adhesion in Capillary-Sized, Ligand-Coated Micropipettes 213

DAVID F. J. TEES, PRITHU SUNDD, AND DOUGLAS J. GOETZ

IV CELL ADHESION TO SURFACES UNDER FLOW 233**11 Adhesion of Flowing Neutrophils to Model Vessel Surfaces: Constraint and Regulation by the Local Hemodynamic Environment 235**

GERARD B. NASH AND G. ED RAINGER

12 Hydrodynamic Interactions Between Cells on Reactive Surfaces 255

DOOYOUNG LEE AND MICHAEL R. KING

13 Dynamics of Platelet Aggregation and Adhesion to Reactive Surfaces Under Flow 267

NIPAA. MODY AND MICHAEL R. KING

INDEX 295