

Contents

<i>Preface</i>	vii
<i>Contributors</i>	xiii

PART I DESIGNS, PRINCIPLES, AND METHODS

1 Microelectrode Designs for Oxidase-Based Biosensors	3
<i>Stéphane Marinesco and Olivier Frey</i>	
2 Microelectrode Array Fabrication and Optimization for Selective Neurochemical Detection	27
<i>Kevin N. Hascup, Erin R. Hascup, O. Meagan Littrell, Jason M. Hinzman, Catherine E. Werner, Verda A. Davis, Jason J. Burmeister, Francois Pomerleau, Jorge E. Quintero, Peter Huettl, and Greg A. Gerhardt</i>	
3 The Advantage of Microelectrode Technologies for Measurement in Delicate Biological Environments Such as Brain Tissue	55
<i>Andrea Jaquins-Gerstl and Adrian C. Michael</i>	
4 Hexacyanoferrates as Mediators for Microelectrode Biosensors	69
<i>Faming Tian and Nicholas Dale</i>	
5 Enzyme Immobilization on Microelectrode Biosensors	95
<i>Natalia Vasylieva and Stéphane Marinesco</i>	
6 Characterization of Polymer–Enzyme Composite Biosensors for Brain Monitoring In Vivo	115
<i>Robert D. O'Neill</i>	

PART II CASE STUDIES

7 Monitoring Extracellular Glutamate in the Brain by Microdialysis and Microsensors	153
<i>Si Qin, Miranda (van der Zeyden) Evering, Ngabi Wahono, Thomas I.F.H. Cremers, and Ben H.C. Westerink</i>	
8 Sub-Second Measurements of Glutamate and Other Neurotransmitter Signaling Using Enzyme-Based Ceramic Microelectrode Arrays	179
<i>Erin R. Hascup, Kevin N. Hascup, Pooja M. Talauliker, David A. Price, Francois Pomerleau, Jorge E. Quintero, Peter Huettl, Alain Gratton, Ingrid Strömberg, and Greg A. Gerhardt</i>	
9 Regulation of Extracellular Concentrations of D-Serine in the Central Nervous System Revealed by D-Amino Acid Oxidase Microelectrode Biosensors	201
<i>Pierre Pernot, Caroline Maucler, and Stéphane Marinesco</i>	

10	Measurement of Purine Release with Microelectrode Biosensors	221
	<i>Nicholas Dale</i>	
11	Glucose and Lactate Monitoring Across the Rat Sleep–Wake Cycle	241
	<i>Raymond Cespuglio, Larissa Netchiporouk, and Nataliya Shram</i>	
12	Forebrain Cholinergic Systems and Cognition: New Insights Based on Rapid Detection of Choline Spikes Using Enzyme-Based Biosensors	257
	<i>Vinay Parikh and Martin Sarter</i>	
PART III THE FUTURE?		
13	Carbon Nanotubes-Based Microelectrode (Bio)sensors	281
	<i>Paloma Yáñez-Sedeño, Lourdes Agüí, and José M. Pingarrón</i>	
14	Label-Free Affinity Biosensors Based on Electrochemical Impedance Spectroscopy	295
	<i>Nicole Jaffrezic-Renault</i>	
15	Aptamer-Based Electrochemical Biosensors for the Detection of Small Molecules and Plasma Proteins	319
	<i>Cassie Ho and Hua-Zhong Yu</i>	
16	Electrochemiluminescent Biosensors: Neuroscience Applications	347
	<i>Robert J. Forster and Tia E. Keyes</i>	
17	Molecularly Imprinted Polymers: Promising Advanced Materials for In Vivo Sensing	369
	<i>Yi Ge, Samir Akhtar, Farhan Mirza, Sergey Piletsky, Shenqi Wang, and Dan Fei</i>	
	<i>Index</i>	385