

Contents

Part I Methods of Plant Electrophysiology

1	At the Roots of Plant Neurobiology	3
	V. A. Shepherd	
2	Plant Electrostimulation and Data Acquisition	45
	Emil Jovanov and Alexander G. Volkov	
3	Plant Response to Stress: Microelectrode Voltage-Clamp Studies	69
	François Bouteau and Daniel Tran	
4	Application of Non-invasive Microelectrode Flux Measurements in Plant Stress Physiology	91
	Sergey Shabala and Jayakumar Bose	
5	Intracellular Measurements of the Electrical Properties of Walled Cells	127
	Roger R. Lew	
6	Making Contact and Measuring Cellular Electrochemical Gradients	145
	Anthony J. Miller	
7	Studying Membrane Transport Processes by Non-invasive Microelectrodes: Basic Principles and Methods	167
	Sergey Shabala, Lana Shabala and Ian Newman	

8	Multielectrode Array: A New Approach to Plant Electrophysiology	187
	Elisa Masi, Elisa Azzarello and Stefano Mancuso	
9	Electrochemical Impedance Spectroscopy	205
	E. Azzarello, E. Masi and S. Mancuso	
10	Patch Clamp Techniques for Plant Cells	225
	J. Theo M. Elzenga	

Part II Cell Electrophysiology

11	pH Banding in Charophyte Algae	247
	Mary J. Beilby and Mary A. Bisson	
12	Membrane Excitation and Cytoplasmic Streaming as Modulators of Photosynthesis and Proton Flows in Characean Cells	273
	A. A. Bulychev	
13	Functional Characterization of Plant Ion Channels in Heterologous Expression Systems	301
	Yi Wang	
14	Mechanism of Passive Permeation of Ions and Molecules Through Plant Membranes	323
	Alexander G. Volkov, Veronica A. Murphy and Vladislav S. Markin	
Index		359