

CONTENTS

Contributors

ix

1. Unisexual Cucumber Flowers, Sex and Sex Differentiation	1
Shu-Nong Bai and Zhi-Hong Xu	
1. Introduction	2
2. What Was Known About Cucumber Unisexual Flower Development Before 2000	5
3. The Third Option: How the Inappropriate Organs Are Inhibited	7
4. Involvement of Ethylene in Unisexual Flower Development in Cucurbits Plants	14
5. Reexamination of the Meaning of Sex and Sex Determination	17
6. Role of Unisexual Flowers in Plants	43
7. Perspectives and Concluding Remarks	46
Acknowledgments	48
References	48
2. Energization of Vacuolar Transport in Plant Cells and Its Significance Under Stress	57
Thorsten Seidel, Michèle Siek, Berenice Marg, and Karl-Josef Dietz	
1. Introduction	58
2. Background	59
3. Energization of Vacuolar Membranes	65
4. Secondary Active Solute Transport Across the Tonoplast	97
5. Function and Energization of Vacuolar Transport Under Stress Conditions	100
6. Concluding Remarks	106
Acknowledgment	107
References	107
3. Roles of Substance P and ATP in the Subepithelial Fibroblasts of Rat Intestinal Villi	133
Sonoko Furuya and Kishio Furuya	
1. Introduction	135
2. Characteristics of the Subepithelial Fibroblasts of the Intestinal Villi	137
3. ATP- and Mechanosignaling	146
4. Substance P Receptors in Subepithelial Fibroblasts of the Intestinal Villi	155

5. Interactions Between Subepithelial Fibroblasts and SP/Non-SP Neurons	164
6. Mutual Interactions of Substance P and ATP Signaling in the Villi	172
7. Concluding Remarks	175
Acknowledgments	176
References	176
4. Roles of Arginine Vasotocin Receptors in the Brain and Pituitary of Submammalian Vertebrates	191
Itaru Hasunuma, Fumiyo Toyoda, Reiko Okada, Kazutoshi Yamamoto, Yoshihiko Kadono, and Sakae Kikuyama	
1. Introduction	192
2. Roles of AVP/AVT in the CNS	193
3. AVT Receptors	194
4. Distribution and Functions of AVT Receptors in the Brain	198
5. Distribution and Functions of AVT Receptors in the Pituitary Gland	213
6. Conclusion and Perspectives	217
Acknowledgment	218
References	218
5. Roles of Poly(ADP-Ribose) Glycohydrolase in DNA Damage and Apoptosis	227
Xiaoxing Feng and David W. Koh	
1. Introduction	228
2. Poly(ADP-Ribose) Biopolymer	229
3. Synthesis of Poly(ADP-Ribose): PARP Family	231
4. Hydrolysis of Poly(ADP-Ribose): PARG	237
5. PARG and DNA-Damage Repair	246
6. PARG and Cell Death	251
7. Therapeutic Potential	263
8. Concluding Remarks	267
References	268
6. Prospective Potency of TGF-β1 on Maintenance and Regeneration of Periodontal Tissue	283
Hidefumi Maeda, Naohisa Wada, Atsushi Tomokiyo, Satoshi Monnouchi, and Akifumi Akamine	
1. Introduction	284
2. Biology of TGF- β 1	286
3. Overview of the PDL Tissue	302

4. Functions of TGF- β on PDL Cells	315
5. Biology of PDL Stem Cells	329
6. Development of PDLSC-Like Cell Lines	331
7. Effects of TGF- β 1 on PDLSC-Like Cell Lines	336
8. TGF- β 1 Expression in Tensile-Loaded PDL Cells	337
9. Concluding Remarks	340
Acknowledgments	340
References	340
7. Calcium Signaling in Extraembryonic Domains During Early Teleost Development	369
Sarah E. Webb and Andrew L. Miller	
1. Introduction	370
2. Calcium Signaling in the Embryonic Yolk Cell (YC)	373
3. Calcium Signaling in the Enveloping Layer (EVL)	383
4. Calcium Signaling in the Yolk Syncytial Layer (YSL)	390
5. Conclusions	402
Acknowledgments	407
References	407
8. New Insights into the Mechanism of Force Generation by Kinesin-5 Molecular Motors	419
Adeline Goulet and Carolyn Moores	
1. Introduction	420
2. Cellular Functions	422
3. Modes of Motility	430
4. Molecular Mechanism of Force Generation	435
5. Concluding Remarks	455
Acknowledgments	456
References	456
9. New Insights into the Functions of Histidine-Rich Glycoprotein	467
Sadao Wakabayashi	
1. Introduction	468
2. Localization, Site of Biosynthesis, and Variation of Plasma Level of HRG	469
3. Protein and Gene Structure of HRG	470
4. Functions of HRG in Blood Coagulation and Fibrinolysis	476
5. Functions of HRG in Angiogenesis	481
6. Functions of HRG in the Immune System	483

7. Other Studies	486
8. Concluding Remarks	486
Acknowledgments	487
References	487

Index

495