

CONTENTS

Contributors

ix

1. New Insight into the Strategy for Nitrogen Metabolism in Plant Cells	1
Min Wang, Qirong Shen, Guohua Xu, and Shiwei Guo	
1. Introduction	2
2. Nitrogen Uptake by Roots	3
3. Nitrogen Transport in Plants	11
4. Distribution of Nitrogen in Plants	14
5. Nitrogen Assimilation	15
6. Interactions Between Carbon and Nitrogen Metabolism	19
7. Regulation of Nitrogen Metabolism: Molecular Aspects	22
8. Conclusions and Perspectives	24
Acknowledgments	25
References	25
2. Discoidin Domain Receptor Functions in Physiological and Pathological Conditions	39
Birgit Leitinger	
1. Introduction	40
2. Expression and Tissue Functions of DDRs	41
3. DDR Structure and Ligand Interactions	44
4. Regulation of DDR Activity	52
5. DDR Functions During Development	58
6. Signaling by DDRs	61
7. DDRs as Potential Therapeutic Targets in Disease	68
8. Conclusions	74
Acknowledgments	76
References	76
3. New Insights into the Roles of Xin Repeat-Containing Proteins in Cardiac Development, Function, and Disease	89
Qinchuan Wang, Jenny Li-Chun Lin, Albert J. Erives, Cheng-I Lin, and Jim Jung-Ching Lin	
1. Introduction	90
2. Organization and Regulation of <i>Xin</i> Genes	93

3. Roles of Xin Proteins in ICD Maturation	106
4. Roles of Xin Proteins in Ion-Channel Surface Expression	114
5. Concluding Remarks	120
Acknowledgments	121
References	122
4. New Insights into Vertebrate Skin Regeneration	129
Ashley W. Seifert and Malcolm Maden	
1. Introduction	130
2. Bridging Repair and Regeneration	131
3. Overview of Mammalian Wound Repair	133
4. Insights from Fetal Wound Healing	137
5. Limitations of Extrapolating from Fetal Wound-Healing Studies	143
6. Skin Regeneration in Adult Vertebrates	145
7. Concluding Remarks	161
References	163
5. Mechanotransduction Pathways Linking the Extracellular Matrix to the Nucleus	171
Zeinab Jahed, Hengameh Shams, Mehrdad Mehrbod, and Mohammad R.K. Mofrad	
1. Introduction	172
2. ECM Molecules	173
3. Integrins	176
4. Integrin-Actin Linkers: Focal Adhesion Formation	180
5. Integrins Team Up (Integrin Clustering)	195
6. Missing LINC: Linkers of Nucleoskeleton and Cytoskeleton	199
7. Conclusions	202
8. Future Research Directions	207
Acknowledgments	209
References	209
6. Formation and Maintenance of the Golgi Apparatus in Plant Cells	221
Yoko Ito, Tomohiro Uemura, and Akihiko Nakano	
1. Introduction	222
2. Features of Plant Golgi as Compared to Animal and Yeast Cells	222
3. ER-Golgi Transport	235
4. Intra-Golgi Trafficking	253

5. Formation and Maintenance of Stacked Structure	258
6. Relationship Between the Golgi Apparatus and the TGN	265
7. Concluding Remarks	267
Acknowledgments	267
References	268
7. Cell and Molecular Biology of Septins	289
Karen Y.Y. Fung, Lu Dai, and William S. Trimble	
1. Introduction	290
2. Septin Discovery and General Properties	290
3. Functions of Septins	302
4. Septins in Complex Biological Processes	311
5. Septin-Associated Diseases	321
6. Concluding Remarks	327
References	328
Index	341