

1. Record Nr.	UNINA9910825204803321
Titolo	Root genomics and soil interactions // edited by Martin Crespi
Pubbl/distr/stampa	Hoboken, N.J., : Wiley-Blackwell, 2012
ISBN	9781118447123 1118447123 9781118447093 1118447093 9781283644358 1283644355 9781118447130 1118447131
Edizione	[1st ed.]
Descrizione fisica	1 online resource (306 p.)
Altri autori (Persone)	CrespiMartin
Disciplina	575.5/4
Soggetti	Roots (Botany) - Physiology Roots (Botany) - Development Plant genomes Genomics Plant-soil relationships
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Root Genomics and Soil Interactions; Contents; Contributors; Preface; 1 Genomics of Root Development; Introduction; Roots: Rising from the Underground; Primary Root Structure and Development: Lessons from the Arabidopsis Model; Root Branching; Lateral Root Initiation; Genomics of LRI; IAA Proteins; Auxin Response Factor Transcription Factors; Downstream of ARF Factors; Cell Cycle; Asymmetric and Formative Divisions; Digging into LRI, the Priming of the Pericycle; Primordium Patterning, Emergence, and Activation; Rise of New Technologies to Understand Lateral Root Development; Inducing LRI Spatiotemporal Maps of Cell Types and Developmental Zones ComparativOmics, the Future; Acknowledgments; References; 2 The Complex Eukaryotic Transcriptome: Nonprotein-Coding RNAs and Root

Development; Genomic Approaches Reveal Novel Aspects of the Eukaryotic Transcriptome; The Role of RNA-Binding Proteins in npcRNA Metabolism and Activity; Nonprotein-Coding RNAs in Root Development; Future Perspectives; Acknowledgments; References; 3 Genomics of Auxin Action in Roots; Introduction; The Basis of Auxin Biology; Auxin Synthesis and Transport; Auxin Response-Mediated Transcription
Auxin Genomics in Root Development Auxin Plays a Role in Primary Root Development; Auxin and Root Hair Development; Auxin in Gravitropism; Auxin in LR Initiation; Conclusion; Acknowledgments; References; 4 Cell-Type Resolution Analysis of Root Development and Environmental Responses; Introduction; Tools for Cell-Type Resolution Analysis; In the Beginning . . .; Fluorescence-Activated Cell Sorting of Green Fluorescent Protein-Marked Cells; Laser Capture Microdissection; Immunoprecipitation of Ribosome-Associated Transcripts; Affinity Purification of Nuclei Using the INTACT Method
Analysis of Spatiotemporal Expression Patterns in the Arabidopsis Root Analysis of Cell-Type-Specific Expression Patterns in the Rice Root; Cell-Type-Specific Analysis of Auxin; Cell-Type-Specific Analyses of Chromatin; Cell-Type-Specific Analyses of Responses to Environmental Change; Nitrate; Salt Stress; Iron Deprivation; Meta-Analysis of Stress Responses; Hypoxia; Future Prospects; Acknowledgments; References; 5 Toward a Virtual Root: Interaction of Genomics and Modeling to Develop Predictive Biology Approaches; Introduction; Assembling Root Gene Regulatory Pathways Using Genomics
Modeling Well-Characterized Small Root Gene Regulatory Networks Building New Large-Scale Root Gene Regulatory Network; Building Large-Scale Root GRN Using Systematic Screens for Interactions; Building Large-Scale Root GRN Using Statistical Inference Algorithms; Multi-Scale Modeling Approaches to Study Root Growth and Development; Conclusions and Future Challenges; References; 6 Genomics of Root Hairs; Genomics with Single Cells; Root Hair Development; High-Throughput Approaches for the Characterization of Root Hairs; Genetic Screening for Root Hair Mutants and Genes Transcriptomics and Root Hairs

Sommario/riassunto

Fully integrated and comprehensive in its coverage, *Root Genomics and Soil Interactions* examines the use of genome-based technologies to understand root development and adaptability to biotic and abiotic stresses and changes in the soil environment. Written by an international team of experts in the field, this timely review highlights both model organisms and important agronomic crops. Coverage includes: novel areas unveiled by genomics research basic root biology and genomic approaches applied to analysis of root responses to the soil environment. Each chapter provides a succinct yet
