ON THE INSIDE

Peter V. Minorsky

GENOME ANALYSIS


[C][W][OA] The Association of Multiple Interacting Genes with Specific Phenotypes in Rice Using Gene Coexpression Networks. Stephen P. Ficklin, Feng Luo, and F. Alex Feltus

BREAKTHROUGH TECHNOLOGIES

[C][OA] iTILLING: A Personalized Approach to the Identification of Induced Mutations in Arabidopsis. Susan M. Bush and Patrick J. Krysan

BIOINFORMATICS

[C][W][OA] Combining Machine Learning and Homology-Based Approaches to Accurately Predict Subcellular Localization in Arabidopsis. Rakesh Kaundal, Reena Saini, and Patrick X. Zhao

RESEARCH ARTICLES

BIOCHEMICAL PROCESSES AND MACROMOLECULAR STRUCTURES


OS: Secondary cell wall thickenings from cultured Zinnia elegans tracheary elements are rich in lignocellulose and autofluorescent due to the presence of lignin (top image). The topography of the secondary cell wall can be visualized after generating cell fragments, which include rings of these secondary wall thickenings (bottom left; atomic force microscopy image). Closer examination of a region (box) within this ring reveals cellulose fibrils that are embedded in a granular matrix and organized in a parallel, concentric orientation (bottom right; atomic force microscopy image). To investigate the composition and structure of the cell wall of individual tracheary elements, Lacayo et al. (pp. 121–133) employed three imaging platforms in conjunction with chemical extraction and a fluorescent cellulose binding protein. Cultured tracheary elements from Z. elegans can provide important insights into cell wall development, organization, and dynamics, which are especially important in research on lignocellulosic biofuel production. Fluorescence microscopy image and cover design by Dr. Catherine Lacayo; atomic force microscopy images by Dr. Alexander Malkin.

Continued on next page
A Glucurono(arabino)xylan Synthase Complex from Wheat Contains Members of the GT43, GT47, and GT75 Families and Functions Cooperatively. Wei Zeng, Nan Jiang, Ramya Nadella, Tara L. Killen, Vijayanand Nadella, and Ahmed Faik 78

Identification and Characterization of Proteins Involved in Rice Urea and Arginine Catabolism. Feng-Qiu Cao, Andrea K. Werner, Kathleen Dahncke, Tina Romeis, Lai-Hua Liu, and Claus-Peter Witte 98

A Copal-8-ol Diphosphate Synthase from the Angiosperm Cistus creticus subsp. creticus Is a Putative Key Enzyme for the Formation of Pharmacologically Active, Oxygen-Containing Labdane-Type Diterpenes. Vasiliki Falara, Eran Pichersky, and Angelos K. Kanellis 301

A Genome-Scale Metabolic Model Accurately Predicts Fluxes in Central Carbon Metabolism under Stress Conditions. Thomas C.R. Williams, Mark G. Poolman, Andrew J.M. Howden, Markus Schwarzerlander, David A. Fell, R. George Ratcliffe, and Lee J. Sweetlove 311

CYP93G2 Is a Flavanone 2-Hydroxylase Required for C-Glycosylflavone Biosynthesis in Rice. Yegang Du, Hung Chu, Ivan K. Chu, and Clive Lo 324

BIOENERGETICS AND PHOTOSYNTHESIS

Cooperation of LPA3 and LPA2 Is Essential for Photosystem II Assembly in Arabidopsis. Wenhe Cai, Jinfang Ma, Wei Chi, Meijuan Zou, Jinkui Guo, Congming Lu, and Lixin Zhang 109

Combined Effects of CO₂ and Light on the N₂-Fixing Cyanobacterium Trichodesmium IMS101: Physiological Responses. Sven A. Kranz, Orly Levitan, Klaus-Uwe Richter, Ondřej Prášil, Ilana Berman-Frank, and Björn Rost 334

Combined Effects of CO₂ and Light on the N₂-Fixing Cyanobacterium Trichodesmium IMS101: A Mechanistic View. Orly Levitan, Sven A. Kranz, Dina Spungin, Ondřej Prášil, Björn Rost, and Ilana Berman-Frank 346

CELL BIOLOGY AND SIGNAL TRANSDUCTION


Homomeric Interaction of AtVSR1 Is Essential for Its Function as a Vacuolar Sorting Receptor. Hyeran Kim, Hwangju Kang, Mihue Jang, Jeong Ho Chang, Yansong Miao, Liwen Jiang, and Inhwan Huang 134

DEVELOPMENT AND HORMONE ACTION

OsC6, Encoding a Lipid Transfer Protein, Is Required for Postmeiotic Anther Development In Rice. Dasheng Zhang, Wanqi Liang, Changsong Yin, Jie Zong, Fangwei Gu, and Daming Zhang 149


ENVIRONMENTAL STRESS AND ADAPTATION TO STRESS


Continued on next page
Successful Reproduction Requires the Function of Arabidopsis YELLOW STRIPE-LIKE1 and YELLOW STRIPE-LIKE3 Metal-Nicotianamine Transporters in Both Vegetative and Reproductive Structures. Heng-Hsuan Chu, Jeff Chiecko, Tracy Punshon, Antonio Lanzetti, Brett Lahner, David E. Salt, and Elisabeth L. Walker

TaCHP: A Wheat Zinc Finger Protein Gene Down-Regulated by Abscisic Acid and Salinity Stress Plays a Positive Role in Stress Tolerance. Cuiling Li, Jian Lv, Xin Zhao, Xinghui Ai, Xinlei Zhu, Mengcheng Wang, Shuangyi Zhao, and Guangmin Xia

Arabidopsis Plants Acclimate to Water Deficit at Low Cost through Changes of Carbon Usage: An Integrated Perspective Using Growth, Metabolite, Enzyme, and Gene Expression Analysis. Irène Hummel, Florent Pantin, Ronan Sulpice, Maria Piques, Gaëlle Rolland, Myriam Dauzat, Angélique Christophe, Marjorie Perent, Marie Bouteille, Marie-Béatrice, Mark Stitt, Yves Gibon, and Bertrand Muller

Functional Analysis of the Group 4 Late Embryogenesis Abundant Proteins Reveals Their Relevance in the Adaptive Response during Water Deficit in Arabidopsis. Yadira Olvera-Carrillo, Francisco Campos, José Luis Reyes, Alejandro Garciarrubio, and Alejandra A. Covarrubias

PLANTS INTERACTING WITH OTHER ORGANISMS

RTM3, Which Controls Long-Distance Movement of Potyviruses, Is a Member of a New Plant Gene Family Encoding a Meprin and TRAF Homology Domain-Containing Protein. Patrick Cosson, Luc Sofer, Quang Hien Le, Valérie Léger, Valérie Schurdi-Leveau, Steven A. Whitham, Miki L. Yamamoto, Suress Gopalan, Olivier Le Gall, Thierry Candresse, James C. Carrington, and Frédéric Revers

Plant Immunity Directly or Indirectly Restricts the Injection of Type III Effectors by the Pseudomonas syringae Type III Secretion System. Emerson Crabill, Anna Joe, Anna Block, Jennifer M. van Rooyen, and James R. Alfano


Ethylene Signaling Regulates Accumulation of the FLS2 Receptor and Is Required for the Oxidative Burst Contributing to Plant Immunity. Sophia Mersmann, Gildas Bourdais, Steffen Rietz, and Silke Robatzek

WHOLE PLANT AND ECOPHYSIOLOGY

Cryptochrome as a Sensor of the Blue/Green Ratio of Natural Radiation in Arabidopsis. Romina Sellaro, María Crepy, Santiago Ariel Trupkin, Elizabeth Karayekov, Ana Sabrina Buchovskaya, Constanza Rossi, and Jorge José Casal

SYSTEMS BIOLOGY, MOLECULAR BIOLOGY, AND GENE REGULATION

Overexpression of the Epidermis-Specific Homeodomain-Leucine Zipper IV Transcription Factor OUTER CELL LAYER1 in Maize Identities Target Genes Involved in Lipid Metabolism and Cuticle Biosynthesis. Marie Javelle, Vanessa Vernoud, Nathalie Depège-Fargeix, Christine Arnauld, Delphine Oursel, Frédéric Domergue, Xavier Sarda, and Peter M. Rogowsky

An Atlas of Type I MADS Box Gene Expression during Female Gametophyte and Seed Development in Arabidopsis. Marian Bemer, Klaas Heijmans, Chiara Airoldi, Brendan Davies, and Gerco C. Angenent

Continued from preceding page

Continued on next page

Multiple Regulatory Elements in the Arabidopsis NIA1 Promoter Act Synergistically to Form a Nitrate Enhancer. Rongchen Wang, Peizhu Guan, Mingsheng Chen, Xiujuan Xing, Yali Zhang, and Nigel M. Crawford

Some figures in this article are displayed in color online but in black and white in the print edition. Indicates Web-only data. Open Access articles can be viewed online without a subscription.