EDITORIAL
Large-Scale Biology
Rich Jorgensen

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A Discussion of Statistical Methods for Design and Analysis of Microarray Experiments for Plant Scientists
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RESEARCH ARTICLES
Genomic and Genetic Characterization of Rice Cen3 Reveals Extensive Transcription and Evolutionary Implications of a Complex Centromere

Discovery of Cyclotide-Like Protein Sequences in Graminaceous Crop Plants: Ancestral Precursors of Circular Proteins?

Visualizing Plant Development and Gene Expression in Three Dimensions Using Optical Projection Tomography
Karen Lee, Jerome Avondo, Harris Morrison, Lilian Blot, Margaret Stark, James Sharpe, Andrew Bangham, and Enrico Coen

ON THE COVER
Accurate three-dimensional imaging of plant structures and gene activity is important for a comprehensive understanding of plant growth and development. Lee et al. (pages 2145–2156) explore the use of optical projection tomography for three-dimensional imaging of plant structures in Arabidopsis and Antirrhinum. The cover image shows a leaf of Arabidopsis transformed with a GUS construct driven by the ATHB8 vein marker gene promoter, enhanced in different ways using visualization techniques described in the article. Top row: QtVolView lighting and tone-shader effects; middle row: combined transmission (visible; red) and fluorescent (GFP1; green) channels; bottom row: stained veins extracted using semiautomatic segmentation tools. See also the In Brief feature on this article on page 2100.
Functional Profiling Reveals That Only a Small Number of Phytochrome-Regulated Early-Response Genes in Arabidopsis Are Necessary for Optimal Deetiolation

Rajnish Khanna, Yu Shen, Gabriela Toledo-Ortiz, Elise A. Kikis, Henrik Johannesson, Yong-Sic Hwang, and Peter H. Quail

GA4 Is the Active Gibberellin in the Regulation of LEAFY Transcription and Arabidopsis Floral Initiation

Sven Eriksson, Henrik Böhnius, Thomas Moritz, and Ove Nilsson

Oscillatory Increases in Alkalinity Anticipate Growth and May Regulate Actin Dynamics in Pollen Tubes of Lily


Tobacco WLIM1 Is a Novel F-Actin Binding Protein Involved in Actin Cytoskeleton Remodeling

Clément Thomas, Céline Hoffmann, Monika Dieterle, Marleen Van Troys, Christophe Ampe, and André Steinmetz

The Cytoskeleton Maintains Organelle Partitioning Required for Single-Cell C4 Photosynthesis in Chenopodiaceae Species

Simon D.X. Chuong, Vincent R. Franceschi, and Gerald E. Edwards

The Balance between Cell Division and Endoreplication Depends on E2FC-DPB, Transcription Factors Regulated by the Ubiquitin-SCF<sup>SKP2A</sup> Pathway in Arabidopsis

Juan C. del Pozo, Sara Diaz-Trivino, Nerea Cisneros, and Crisanto Gutierrez

The Synechocystis sp PCC 6803 Oxa1 Homolog Is Essential for Membrane Integration of Reaction Center Precursor Protein pD1

Friedrich Osßenbühl, Masami Inaba-Sulpice, Jörg Meurer, Jürgen Soll, and Lutz A. Eichacker

Tic21 Is an Essential Translocon Component for Protein Translocation across the Chloroplast Inner Envelope Membrane

Yi-Shan Teng, Yi-shin Su, Lih-Jen Chen, Yong Jik Lee, Inhwan Hwang, and Hsou-min Li

Arabidopsis EPSIN1 Plays an Important Role in Vacular Trafficking of Soluble Cargo Proteins in Plant Cells via Interactions with Clathrin, AP-1, VTI11, and VSR1

Jinhee Song, Myoung Hui Lee, Gil-Je Lee, Cheol Min Yoo, and Inhwan Hwang

Overexpression of the Arabidopsis Syntaxin PEP12/SYP21 Inhibits Transport from the Prevacuolar Compartment to the Lytic Vacuole in Vivo

Ombretta Foresti, Luis L.P. daSilva, and Jürgen Denecke

Tung Tree DGAT1 and DGAT2 Have Nonredundant Functions in Triacylglycerol Biosynthesis and Are Localized to Different Subdomains of the Endoplasmatic Reticulum


Rapid Metabolism of Glucose Detected with FRET Glucose Nanosensors in Epidermal Cells and Intact Roots of Arabidopsis RNA-Silencing Mutants

Karen Deuschle, Bhavna Chaudhuri, Sakiko Okumoto, Ida Lager, Sylvie Lalonde, and Wolf B. Frommer

Interaction between Rice MYBGA and the Gibberellin Response Element Controls Tissue-Specific Sugar Sensitivity of α-Amylase Genes

Peng-Wen Chen, Chih-Ming Chiang, Tung-Hi Tseng, and Su-May Yu

Mitochondria-Associated Hexokinases Play a Role in the Control of Programmed Cell Death in Nicotiana benthamiana

Moonil Kim, Jeong-Hwa Lim, Chang Sook Ahn, Kyoungsook Park, Gyung Tae Kim, Woo Taek Kim, and Hyun-Sook Pai

Rice NTRC Is a High-Efficiency Redox System for Chloroplast Protection against Oxidative Damage

Juan Manuel Pérez-Ruiz, Maria Cristina Spinola, Kerstin Kirchsteiger, Javier Moreno, Mariam Sahrawy, and Francisco Javier Cejudo
Biz1, a Zinc Finger Protein Required for Plant Invasion by *Ustilago maydis*, Regulates the Levels of a Mitotic Cyclin  
Ignacio Flor-Parra, Miroslav Vranes, Jörg Kämper, and José Pérez-Martín

The Clp1 Protein Is Required for Clamp Formation and Pathogenic Development of *Ustilago maydis*  
Mario Scherer, Kai Heimel, Verena Starke, and Jörg Kämper

Multiple Avirulence Paralogues in Cereal Powdery Mildew Fungi May Contribute to Parasite Fitness and Defeat of Plant Resistance  
Christopher J. Ridout, Pari Skamnioti, Oliver Porritt, Soledad Sacristan, Jonathan D.G. Jones, and James K.M. Brown

CORRECTION  

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