IN THIS ISSUE
Oxylipin Signaling in Plant Stress Responses 495
Nancy A. Eckardt

IN BRIEF
The IMEter Predicts an Intron’s Ability to Boost Gene Expression 498
Kathleen L. Farquharson

Aquaporins and Chloroplast Membrane Permeability 499
Nancy A. Eckardt

Cellulose Synthesis in Phytophthora infestans Pathogenesis 500
Jennifer Mach

Heritability of the Tomato Fruit Metabolome 501
Nancy A. Eckardt

CURRENT PERSPECTIVE ESSAY
SPECIAL SERIES ON LARGE-SCALE BIOLOGY
Pond Scum Genomics: The Genomes of Chlamydomonas and Ostreococcus 502
Graham Peers and Krishna K. Niyogi

RESEARCH ARTICLES
Mode of Inheritance of Primary Metabolic Traits in Tomato 509
Nicolas Schauer, Yaniv Semel, Ilse Balbo, Matthias Steinfath, Dirk Repsilber, Joachim Selbig, Tzili Pleban, Dani Zamir, and Alisdair R. Fernie

The Leaf Epidermome of Catharanthus roseus Reveals Its Biochemical Specialization 524
Jun Murata, Jonathon Roepke, Heather Gordon, and Vincenzo De Luca

Promoter-Proximal Introns in Arabidopsis thaliana Are Enriched in Dispersed Signals that Elevate Gene Expression 543
Alan B. Rose, Tali Eifersi, Genis Parra, and Ian Korf

Heme, a Plastid-Derived Regulator of Nuclear Gene Expression in Chlamydomonas 552
Erika D. von Gromoff, Ali Alawady, Linda Meinecke, Bernhard Grimm, and Christoph F. Beck

ON THE COVER
The oomycete pathogen Phytophthora infestans has a cell wall composed mainly of cellulose, by contrast with most fungal pathogens, which have chitin-based cell walls. During infection, P. infestans breaks down host cell walls but synthesizes a new cell wall of its own to make infection-associated structures and grow and proliferate within the host. Grenville-Briggs et al. (pages 720–738) present a functional characterization of a family of four P. infestans cellulose synthase (CesA) genes, which form a distinct phylogenetic group that is most closely related to cyanobacterial CesA genes. The authors show that expression of all four genes is upregulated during early infection stages of potato, and chemical inhibition of cellulose synthesis leads to defects in the infection process and a complete loss of pathogenicity. These results show that cellulose synthesis is required for infection of potato by P. infestans.
The Highly Similar Arabidopsis Homologs of Trithorax ATX1 and ATX2 Encode Proteins with Divergent Biochemical Functions

Abdelaty Saleh, Raul Alvarez-Venegas, Mehtap Yilmaz, Oahn-Le, Guichuan Hou, Monther Sadder, Ayed Al-Abdallat, Yuannan Xia, Guoqinq Lu, Istvan Ladunga, and Zoya Avramova

ARABIDOPSIS TRITHORAX1 Dynamically Regulates FLOWERING LOCUS C Activation via Histone 3 Lysine 4 Trimethylation

Stéphane Pien, Delphine Fleury, Joshua S. Mylne, Pedro Crevillen, Dirk Inzé, Zoya Avramova, Caroline Dean, and Ueli Grossniklaus

EMB2473/MIRO1, an Arabidopsis Miro GTPase, Is Required for Embryogenesis and Influences Mitochondrial Morphology in Pollen

Shohei Yamaoka and Christopher J. Leaver

Haplo-Insufficiency of MPK3 in MPK6 Mutant Background Uncovers a Novel Function of These Two MAPKs in Arabidopsis Ovule Development

Huachun Wang, Yidong Liu, Kristin Bruffett, Justin Lee, Gerd Hause, John C. Walker, and Shuqun Zhang

Exclusion of a Proton ATPase from the Apical Membrane Is Associated with Cell Polarity and Tip Growth in Nicotiana tabacum Pollen Tubes

Ana C. Certal, Ricardo B. Almeida, Lara M. Carvalho, Eric Wong, Nuno Moreno, Erwan Michard, Jorge Carneiro, Joaquín Rodríguez-Léon, Hen-Ming Wu, Alice Y. Cheung, and José A. Feijó

The AGL62 MADS Domain Protein Regulates Cellularization during Endosperm Development in Arabidopsis

Il-Ho Kang, Joshua G. Steffen, Michael F. Portereiko, Alan Lloyd, and Gary N. Drews

Function of Nicotiana tabacum Aquaporins as Chloroplast Gas Pores Challenges the Concept of Membrane CO2 Permeability

Norbert Uhlein, Beate Otto, David T. Hanson, Matthias Fischer, Nate McDowell, and Ralf Kaldenhoff

The Arabidopsis P2-ATPase ALA3 Localizes to the Golgi and Requires a β-Subunit to Function in Lipid Translocation and Secretory Vesicle Formation


The Arabidopsis thaliana Type I Isopentenyl Diphosphate Isomerases Are Targeted to Multiple Subcellular Compartments and Have Overlapping Functions in Isoprenoid Biosynthesis

Michael A. Phillips, John C. D’Auria, Jonathan Gershenzon, and Eran Pichersky

The F-Box Protein ACRE189/ACIF1 Regulates Cell Death and Defense Responses Activated during Pathogen Recognition in Tobacco and Tomato

Harrold A. van den Burg, Dimitrios I. Tsitsigiannis, Owen Rowland, Jane Lo, Ghansayam Rallapalli, Daniel MacLean, Frank L.W. Takken, and Jonathan D.G. Jones

Cellulose Synthesis in Phytophthora infestans Is Required for Normal Appressorium Formation and Successful Infection of Potato


The Coiled-Coil and Nucleotide Binding Domains of the Potato Rx Disease Resistance Protein Function in Pathogen Recognition and Signaling

Gregory J. Rairdan, Sarah M. Collier, Melanie A. Sacco, Thomas T. Baldwin, Teresa Boettich, and Peter Moffett
A MYB Transcription Factor Regulates Very-Long-Chain Fatty Acid Biosynthesis for Activation of the Hypersensitive Cell Death Response in Arabidopsis

Sylvain Raffaele, Fabienne Vailleau, Amandine Léger, Jérôme Joubès, Otto Miersch, Carine Huard, Elisabeth Blée, Sébastien Mongrand, Frédéric Domergue, and Dominique Roby

General Detoxification and Stress Responses Are Mediated by Oxidized Lipids through TGA Transcription Factors in Arabidopsis

Stefan Mueller, Beate Hilbert, Katharina Dueckershoff, Thomas Roitsch, Markus Krischke, Martin J. Mueller, and Susanne Berger

Modulation of Nitrosative Stress by S-Nitrosoglutathione Reductase Is Critical for Thermotolerance and Plant Growth in Arabidopsis

Ung Lee, Chris Wie, Bernadette O. Fernandez, Martin Feelisch, and Elizabeth Vierling

Phospholipase D\textsubscript{a3} Is Involved in the Hyperosmotic Response in Arabidopsis

Yueyun Hong, Xiangqiong Pan, Ruth Welti, and Xuemin Wang

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