Chloroplast envelope membranes are known to be damaged by environmental stresses such as heat, drought, UV-B, and element toxicity. However, how envelope integrity is maintained is largely unknown. Zhang et al. (pages 3695-3707) report that Arabidopsis thaliana chloroplasts swell and form “balloon-like structures” when depleted in VESICLE-INDUCING PROTEIN IN PLASTIDS1 (VIPP1). VIPP1 forms a large complex at envelopes and appears to become highly mobile when chloroplasts receive osmotic stress, suggesting that VIPP1 is a multifunctional protein involved in maintenance of envelope integrity. The cover image shows an example of the balloon-like chloroplasts in a vipp1 knockdown mutant.

IN BRIEF

The Molecular Mechanism of the UVR8 UV-B Photoreceptor
Nancy R. Hofmann
3485

Why Wiry? Tomato Mutants Reveal Connections among Small RNAs, Auxin Response Factors, Virus Infection, and Leaf Morphology
Jennifer Mach
3486

Rapid Centromere Evolution in Potato: Invasion of the Satellite Repeats
Jennifer Mach
3487

LARGE-SCALE BIOLOGY ARTICLES

The Grapevine Expression Atlas Reveals a Deep Transcriptome Shift Driving the Entire Plant into a Maturation Program
Marianna Fasoli, Silvia Dal Santo, Sara Zenoni, Giovanni Battista Tornielli, Lorenzo Farina, Anita Zamboni, Andrea Porceddu, Luca Venturini, Manuele Bicego, Vittorio Murino, Alberto Ferrarini, Massimo Delledonne, and Mario Pezzotti
3489

A Systems Biology View of Responses to Lignin Biosynthesis Perturbations in Arabidopsis
Ruben Vanholme, Véronique Storme, Bartel Vanholme, Lisa Sundin, Jørgen Holst Christensen, Geert Goeminne, Claire Halpin, Antje Rohde, Kris Morreel, and Wout Boerjan
3506

Arabidopsis Defense against Botrytis cinerea: Chronology and Regulation Deciphered by High-Resolution Temporal Transcriptomic Analysis
Oliver Windram, Priyadharshini Madhou, Stuart McHattie, Claire Hill, Richard Hickman, Emma Cooke, Dafydd J. Jenkins, Christopher A. Penfold, Laura Baxter, Emily Breeze, Steven J. Kiddie, Johanna Rhodes, Susanna Atwell, Daniel J. Kliebenstein, Youn-sung Kim, Oliver Stegle, Karsten Borgwardt, Cunjin Zhang, Alex Tabrett, Roxane Legaie, Jonathan Moore, Bärbel Finkenstadt, David L. Wild, Andrew Mead, David Rand, Jim Beynon, Sascha Ott, Vicky Buchanan-Wollaston, and Katherine J. Denby
3530
Repeatless and Repeat-Based Centromeres in Potato: Implications for Centromere Evolution

Zhiyun Gong, Yufeng Wu, Andrea Kobližková, Giovana A. Torres, Kai Wang, Marina Iovene, Pavel Neumann, Wenli Zhang, Petr Novák, C. Robin Buell, Jiří Macas, and Jiming Jiang

Failure of the Tomato Trans-Acting Short Interfering RNA Program to Regulate AUXIN RESPONSE FACTOR3 and ARF4 Underlies the Wiry Leaf Syndrome

Tamar Yifhar, Irena Pekker, Dror Peled, Gilgi Friedlander, Anna Pistunov, Moti Sabban, Guy Wachsman, John Paul Alvarez, Ziva Amsellem, and Yuval Eshed

IAA-Ala Resistant3, an Evolutionarily Conserved Target of miR167, Mediates Arabidopsis Root Architecture Changes during High Osmotic Stress

Natsuko Kinoshita, Huan Wang, Hiroyuki Kasahara, Jun Liu, Cameron MacPherson, Yasunori Machida, Yuji Kamiya, Matthew A. Hannah, and Nam-Hai Chua

Mutations in the Arabidopsis H3K4me2/3 Demethylase JMJ14 Suppress Posttranscriptional Gene Silencing by Decreasing Transgene Transcription

Ivan Le Masson, Vincent Jauvion, Nathalie Bouteiller, Maud Rivard, Taline Elmayan, and Hervé Vaucheret

Functional Analysis of Three Arabidopsis ARGONAUTES Using Slicer-Defective Mutants

Alberto Carbonell, Noah Fahlgren, Hernan Garcia-Ruiz, Kerrigan B. Gilbert, Taiowa A. Montgomery, Tammy Nguyen, Josh T. Cuperus, and James C. Carrington

Overexpression of Arabidopsis Plasmodesmata Germin-Like Proteins Disrupts Root Growth and Development

Byung-Kook Ham, Gang Li, Byung-Ho Kang, Fanchang Zeng, and William J. Lucas

G Protein–Coupled Receptor-Type G Proteins Are Required for Light-Dependent Seedling Growth and Fertility in Arabidopsis

Felix W. Jaffe, Gian-Enrico C. Freschet, Billy M. Valdes, John Runions, Mathews J. Terry, and Lorraine E. Williams

Subunit Organization of a Synechocystis Hetero-Oligomeric Thylakoid FtsH Complex Involved in Photosystem II Repair

Marko Boehm, Jianfeng Yu, Vendula Krynicka, Myles Barker, Martin Tichy, Josef Komenda, Peter J. Nixon, and Jon Nield

Two Interacting Proteins Are Necessary for the Editing of the NdhD-1 Site in Arabidopsis Plastids


Essential Role of VIPP1 in Chloroplast Envelope Maintenance in Arabidopsis

Lingang Zhang, Yusuke Kato, Stephanie Otters, Ute C. Vothknecht, and Wataru Sakamoto
Phospholipid:Diacylglycerol Acyltransferase Is a Multifunctional Enzyme Involved in Membrane Lipid Turnover and Degradation While Synthesizing Triacylglycerol in the Unicellular Green Microalga *Chlamydomonas reinhardtii*

Kangsup Yoon, Danxiang Han, Yantao Li, Milton Sommerfeld, and Qiang Hu

Plastid Localization of the Key Carotenoid Enzyme Phytoene Synthase Is Altered by Isozyme, Allelic Variation, and Activity

Maria Shumskaya, Louis M.T. Bradbury, Regina R. Monaco, and Eleanore T. Wurtzel

Capping Protein Modulates the Dynamic Behavior of Actin Filaments in Response to Phosphatidic Acid in *Arabidopsis*

Jiejie Li, Jessica L. Henty-Ridilla, Shanjin Huang, Xia Wang, Laurent Blanchon, and Christopher J. Staiger

In Vivo Function of Tryptophans in the *Arabidopsis* UV-B Photoreceptor UVR8

Andrew O’Hara and Gareth I. Jenkins

YSL16 Is a Phloem-Localized Transporter of the Copper-Nicotianamine Complex That Is Responsible for Copper Distribution in Rice

Luqing Zheng, Naoki Yamaji, Kengo Yokosho, and Jian Feng Ma

HDT701, a Histone H4 Deacetylase, Negatively Regulates Plant Innate Immunity by Modulating Histone H4 Acetylation of Defense-Related Genes in Rice

Bo Ding, Maria del Rosario Bellizzi, Yuese Ning, Blake C. Meyers, and Guo-Liang Wang

Novel Plant Immune-Priming Compounds Identified via High-Throughput Chemical Screening Target Salicylic Acid Glucosyltransferases in *Arabidopsis*

Yoshiteru Noutoshi, Masateru Okazaki, Tatsuya Kida, Yuta Nishina, Yoshihiko Morishita, Takumi Ogawa, Hideyuki Suzuki, Daisuke Shibata, Yusuke Jikumaru, Atsushi Hanada, Yuji Kamiya, and Ken Shirasu

HapX-Mediated Iron Homeostasis Is Essential for Rhizosphere Competence and Virulence of the Soilborne Pathogen *Fusarium oxysporum*

Manuel S. López-Berges, Javier Capilla, David Turrà, Lukas Schafferer, Sandra Matthijs, Christoph Jöchl, Pierre Comelis, Josep Guarro, Hubertus Haas, and Antonio Di Pietro

Verticillium Infection Triggers VASCULAR-RELATED NAC DOMAIN7-Dependent de Novo Xylem Formation and Enhances Drought Tolerance in *Arabidopsis*

Michael Reusche, Karin Thole, Dennis Janz, Jekaterina Truskina, Sören Rindfleisch, Christine Drübert, Andrea Polle, Volker Lipka, and Thomas Teichmann

Two Direct Targets of Cytokinin Signaling Regulate Symbiotic Nodulation in *Medicago truncatula*

Federico Ariel, Marianne Brault-Hernandez, Carole Laffont, Emeline Huault, Mathias Brault, Julie Plet, Michael Moison, Sandrine Blanchet, Jean Laurent Ichanté, Mireille Chabaud, Sébastien Carrere, Martin Crespi, Raquel L. Chan, and Florian Frugier

Some figures in this article are displayed in color online but in black and white in the print edition.

Online version contains Web-only data.

Open Access articles can be viewed online without a subscription.
This information is current as of December 25, 2017

| eTOCs | Sign up for eTOCs at: [http://www.plantcell.org/cgi/alerts/ctmain](http://www.plantcell.org/cgi/alerts/ctmain) |
| CiteTrack Alerts | Sign up for CiteTrack Alerts at: [http://www.plantcell.org/cgi/alerts/ctmain](http://www.plantcell.org/cgi/alerts/ctmain) |
| Subscription Information | Subscription Information for *The Plant Cell* and *Plant Physiology* is available at: [http://www.aspb.org/publications/subscriptions.cfm](http://www.aspb.org/publications/subscriptions.cfm) |