ON THE COVER

In winter, perennial plants obstruct signaling via sieve tubes and plasmodesmata through callose accumulation, and they surround sensitive shoot apical meristems with tightly packed bud scales. Regrowth in the spring requires the reverse process to facilitate signal delivery. Rinne et al. (pages 130–146) identified 10 putative Populus orthologs of Arabidopsis genes that encode structurally different callose-degrading 1,3-β-glucanases. They show that these enzymes localize at and around plasmodesmata and are differentially regulated by seasonal cues and the hormones GA$_3$ and GA$_4$. The findings provide a mechanistic explanation of how cell–cell communication is modulated during the dormancy cycle. The cover image shows young, vigorously growing Populus trees that continuously monitor photoperiod to keep track of seasonal progression.

IN BRIEF

Novel Mechanism of Viral Interference of Host Plant Suppression by BSCTV C2  
Nancy A. Eckardt

The Plot Thickens: Flowering Specification in Legumes  
Jennifer Mach

Dormancy Cycling in Populus: The Symplasmic Connection  
Gregory Bertoni

PERSPECTIVE

Of PAMPs and Effectors: The Blurred PTI-ETI Dichotomy  
Bart P.H.J. Thomma, Thorsten Nü¨rberger, and Matthieu H.A.J. Joosten

REVIEW

Regulation and Flexibility of Genomic Imprinting during Seed Development  
Michael T. Raissig, Célie Baroux, and Ueli Grossniklaus

RESEARCH ARTICLES

Seventy Million Years of Concerted Evolution of a Homoeologous Chromosome Pair, in Parallel, in Major Poaceae Lineages  
Xiyin Wang, Haibao Tang, and Andrew H. Paterson

From Amino Acid to Glucosinolate Biosynthesis: Protein Sequence Changes in the Evolution of Methylthioalkylmalate Synthase in Arabidopsis  
Jan-Willem de Kraker and Jonathan Gershenzon

Evolution and Diverse Roles of the CUP-SHAPED COTYLEDON Genes in Arabidopsis Leaf Development  
Alice Hasson, Anne Plessis, Thomas Blein, Bernard Adroher, Stephen Grigg, Miltos Tsiantis, Arezki Boudaoud, Catherine Damerval, and Patrick Laufs

Cytokinin Regulates the Activity of Reproductive Meristems, Flower Organ Size, Ovule Formation, and Thus Seed Yield in Arabidopsis thaliana  
Isabel Bartrina, Elisabeth Otto, Miroslav Strnad, Tomáš Werner, and Thomas Schmülling

The electronic form of this issue, available at www.plantcell.org, is the journal of record.
Pollen Tubes Lacking a Pair of K+ Transporters Fail to Target Ovules in Arabidopsis

Yongxian Lu, Salil Chanroj, Lalu Zulkifli, Mark A. Johnson, Nobuyuki Uozumi, Alice Cheung, and Heven Sze


Hae Jin Kim, Sung Han Ok, Sung Chul Bahn, Juno Jang, Sung Aeong Oh, Soon Ki Park, David Twell, Stephen Beungtae Ryu, and Jeong Sheep Shin

Pollen Semi-Sterility1 Encodes a Kinesin-1–Like Protein Important for Male Meiosis, Anther Dehiscence, and Fertility in Rice

Shirong Zhou, Yang Wang, Wanchang Li, Zhigang Zhao, Yulong Ren, Yong Wang, Suhai Gu, Qibing Lin, Dan Wang, Ling Jiang, Ning Su, Xin Zhang, Linglong Liu, Zhijun Cheng, Cailin Lei, Jiulin Wang, Xiuping Guo, Fuqing Wu, Hiroshi Ikehashi, Haiyang Wang, and Jianmin Wan

Chilling of Dormant Buds Hyperinduces FLOWERING LOCUS T and Recruits GA-Inducible 1,3-β-Glucanases to Reopen Signal Conduits and Release Dormancy in Populus

Päivi L.H. Rinne, Annikki Welling, Jorma Vahala, Linda Ripel, Raili Ruonala, Jaakko Kangasjärvi, and Christiaan van der Schoot

The Pea GIGAS Gene Is a FLOWERING LOCUS T Homolog Necessary for Graft-Transmissible Specification of Flowering but Not for Responsiveness to Photoperiod

Valérie Hecht, Rebecca E. Laurie, Jacqueline K. Vander Schoor, Stephen Ridge, Claire L. Knowles, Lim Chee Liew, Frances C. Sussmilch, Ian C. Murfet, Richard C. Macknight, and James L. Weller

Malate Plays a Crucial Role in Starch Metabolism, Ripening, and Soluble Solid Content of Tomato Fruit and Affects Postharvest Softening


The PP2A Regulatory Subunit Tap46, a Component of the TOR Signaling Pathway, Modulates Growth and Metabolism in Plants

Chang Sook Ahn, Jeong-A Han, Ho-Seok Lee, Semi Lee, and Hyun-Sook Pai

Distinct Roles of Protein Disulfide Isomerase and P5 Sulfhydryl Oxidoreductases in Multiple Pathways for Oxidation of Structurally Diverse Storage Proteins in Rice

Yayoi Onda, Ai Nagamine, Mutsumi Sakurai, Toshihiro Kumamaru, Masahiro Ogawa, and Yasushi Kawagoe

The Arabidopsis Intracellular Na+/H+ Antiporters NHX5 and NHX6 Are Endosomically Associated and Necessary for Plant Growth and Development

Elias Bassil, Masa-aki Ohto, Tomoya Esumi, Hiromi Tajima, Zhu Zhu, Olivier Cagnac, Mark Belmonte, Zvi Peleg, Toshiro Yamaguchi, and Eduardo Blumwald

Cell-Specific Vacuolar Calcium Storage Mediated by CAX1 Regulates Aplastic Calcium Concentration, Gas Exchange, and Plant Productivity in Arabidopsis

A Three-Dimensional RNA Motif in *Potato spindle tuber viroid* Mediates Trafficking from Palisade Mesophyll to Spongy Mesophyll in *Nicotiana benthamiana* 258
Ryuta Takeda, Anton I. Petrov, Neocles B. Leontis, and Biao Ding

BSCTV C2 Attenuates the Degradation of SAMDC1 to Suppress DNA Methylation-Mediated Gene Silencing in *Arabidopsis* 273
Zhonghui Zhang, Hao Chen, Xiahe Huang, Ran Xia, Qingzhen Zhao, Jianbin Lai, Kunling Teng, Yin Li, Liming Liang, Quansheng Du, Xueping Zhou, Huishan Guo, and Qi Xie

The FRIGIDA Complex Activates Transcription of *FLC*, a Strong Flowering Repressor in *Arabidopsis*, by Recruiting Chromatin Modification Factors 289
Kyuha Choi, Juhyun Kim, Hyun-Ju Hwang, Sanghee Kim, Chulmin Park, Sang Yeol Kim, and Ilha Lee

ATP Synthase Repression in Tobacco Restricts Photosynthetic Electron Transport, CO₂ Assimilation, and Plant Growth by Overacidification of the Thylakoid Lumen 304
Markus Rott, Nádia F. Martins, Wolfram Thiele, Wolfgang Lein, Ralph Bock, David M. Kramer, and Mark A. Schöttler

Assembly of the Chloroplast ATP-Dependent Clp Protease in *Arabidopsis* Is Regulated by the ClpT Accessory Proteins 322
Lars L.E. Sjögren and Adrian K. Clarke

The Nucleus-Encoded trans-Acting Factor MCA1 Plays a Critical Role in the Regulation of Cytochrome f Synthesis in *Chlamydomonas* Chloroplasts 333
Alix Boulouis, Cécile Raynaud, Sandrine Bujaldon, Aude Aznar, Francis-André Wollman, and Yves Choquet

Two Distinct Roles of ARABIDOPSIS HOMOLOG OF TRITHORAX1 (ATX1) at Promoters and within Transcribed Regions of ATX1-Regulated Genes 350
Yong Ding, Zoya Avramova, and Michael Fromm

Glutathione-Indole-3-Acetonitrile Is Required for Camalexin Biosynthesis in *Arabidopsis thaliana* 364
Tongbing Su, Juan Xu, Yuan Li, Lei Lei, Luo Zhao, Hailian Yang, Jidong Feng, Guoqin Liu, and Dongtao Ren

Heterodimers of the *Arabidopsis* Transcription Factors bZIP1 and bZIP53 Reprogram Amino Acid Metabolism during Low Energy Stress 381
Katrin Dietrich, Fridtjof Weltmeier, Andrea Ehlert, Christoph Weiste, Mark Stahl, Klaus Harter, and Wolfgang Droge-Laser

*Arabidopsis* Floral Initiator SKB1 Confers High Salt Tolerance by Regulating Transcription and Pre-mRNA Splicing through Altering Histone H4R3 and Small Nuclear Ribonucleoprotein LSM4 Methylation 396
Zhaoliang Zhang, Shupei Zhang, Ya Zhang, Xin Wang, Dan Li, Qiuling Li, Minghui Yue, Qin Li, Yu-e Zhang, Yunyuan Xu, Yongbiao Xue, Kang Chong, and Shilai Bao

The Submergence Tolerance Regulator SUB1A Mediates Crosstalk between Submergence and Drought Tolerance in Rice 412
Takeshi Fukao, Elaine Yeung, and Julia Bailey-Serres
CORRECTION


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.