

**On the Cover:** Turgor-driven valves on the plant epidermis, stomata, are essential for the growth and survival of land plants and of far-reaching importance to our global environment as well as food security. A series of cartoons show stereotypical steps of stomatal differentiation in dicots, such as *Arabidopsis*, emphasizing the roles of ion transport for proper stomatal movement, allowing carbon dioxide uptake while releasing oxygen and promoting transpirations. Background images emphasize the impact of stomata on atmospheric environment (top left), successful land plants colonization (top middle), and crop production (top right). Images at the bottoms highlight the conserved nature of key stomatal regulatory genes in the basal land plant *Physcomitrella patens* (bottom left) and the loss of regulation of one such gene product, SCREAM, conferring an epidermis solely composed of stomata (bottom right). Cover art by Haruko Hirukawa, The photo of *Physcomitrella* is provided by Mitsuyasu Hasebe, and a confocal microscopy image of *Arabidopsis scrm-D* epidermis is provided by Keiko Torii.

## FOCUS ISSUE ON STOMATA

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[<sup>OPEN</sup>] PECTIN METHYLESTERASE34 Contributes to Heat Tolerance through Its Role in Promoting Stomatal Movement. Ya-Chen Huang, Hui-Chen Wu, Yin-Da Wang, Chia-Hung Liu, Ching-Chih Lin, Dan-Li Luo, and Tsung-Luo Jinn

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[<sup>OPEN</sup>] Stomatal Closure, Basal Leaf Embolism, and Shedding Protect the Hydraulic Integrity of Grape Stems. Uri Hochberg, Carel W. Windt, Alexandre Ponomarenko, Yong-Jiang Zhang, Jessica Gersony, Fulton E. Rockwell, and N. Michele Holbrook

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[<sup>CC-BY</sup>] Reducing Stomatal Density in Barley Improves Drought Tolerance without Impacting on Yield. Jon Hughes, Christopher Hepworth, Chris Dutton, Jessica A. Dunn, Lee Hunt, Jennifer Stephens, Robbie Waugh, Duncan D. Cameron, and Julie E. Gray

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[OPEN] Reconstitution of Abscisic Acid Signaling from the Receptor to DNA via bHLH Transcription Factors. Yohei Takahashi, Yuta Ebisu, and Ken-ichiro Shimazaki

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[CC-BY] Genomic Insights into the Evolution of the Nicotine Biosynthesis Pathway in Tobacco. *Masataka Kajikawa, Nicolas Sierro, Haruhiko Kawaguchi, Nicolas Bakaher, Nikolai V. Ivanov, Takashi Hashimoto, and Tsubasa Shoji*

*A series of metabolic and transport genes involved in the nicotine pathway form a regulon under the control of jasmonate-responsive transcription factors in tobacco.*

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*Solar UV-B inhibits leaf growth in maize by suppressing cell proliferation, a response mediated through a decrease in GAs in the growth zone.* 1110

*Small kernel2* Encodes a Glutaminase in Vitamin B<sub>6</sub> Biosynthesis Essential for Maize Seed Development. *Yan-Zhuo Yang, Shuo Ding, Yong Wang, Cui-Ling Li, Yun Shen, Robert Meeley, Donald R. McCarty, and Bao-Cai Tan*

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[<sup>OPEN</sup>] A Rice PECTATE LYASE-LIKE Gene Is Required for Plant Growth and Leaf Senescence. *Yujia Leng, Yaolong Yang, Deyong Ren, Lichao Huang, Liping Dai, Yuqiong Wang, Long Chen, Zhengjun Tu, Yihong Gao, Xueyong Li, Li Zhu, Jiang Hu, Guangheng Zhang, Zhenyu Gao, Longbiao Guo, Zhaosheng Kong, Yongjun Lin, Qian Qian, and Dali Zeng*

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[OPEN] Functional Conservation and Divergence among Homoeologs of *TaSPL20* and *TaSPL21*, Two SBP-Box Genes Governing Yield-Related Traits in Hexaploid Wheat. Bin Zhang, Weina Xu, Xia Liu, Xinguo Mao, Ang Li, Jingyi Wang, Xiaoping Chang, Xueyong Zhang, and Ruilian Jing

*The triplicated homoeologs of two paralogous TaSPL loci display diverse functions in governing yield-related traits in hexaploid wheat.*

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[OPEN] Concerted Divergence after Gene Duplication in Polycomb Repressive Complexes. Yichun Qiu, Shao-Lun Liu, and Keith L. Adams

*FIS2 and MEA have diverged in concert after simultaneous gene duplication, resulting in functional divergence of the PRC2 complexes in Brassicaceae, which is a novel fate for duplicated genes whose products act in complexes.*

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[OPEN] SDG2-Mediated H3K4me3 Is Crucial for Chromatin Condensation and Mitotic Division during Male Gametogenesis in Arabidopsis. Violaine Pinon, Xiaozhen Yao, Aiwu Dong, and Wen-Hui Shen

*Active H3K4me3 deposition is essential for gametophyte chromatin landscape, playing critical roles in gamete mitotic cell cycle progression and pollen vegetative cell function.*

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*mRNAs coding for ribosomal proteins are preferentially stored during heat shock and released during recovery phase to enhance ribosome production in an HSP101-dependent manner.*

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[CC-BY] MAP Kinase PrMPK9-1 Contributes to the Self-Incompatibility Response. Lijun Chai, Richard L. Tudor, Natalie S. Poulter, Katie A. Wilkins, Deborah J. Eaves, F. Christopher H. Franklin, and Veronica E. Franklin-Tong

*A TDY-class MAPK is functionally involved in mediating self-incompatibility in Papaver.*

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Constitutively Active Arabidopsis MAP Kinase 3 Triggers Defense Responses Involving Salicylic Acid and SUMM2 Resistance Protein. Baptiste Genot, Julien Lang, Souha Berriri, Marie Garmier, Françoise Gilard, Stéphanie Pateyron, Katrien Haustraete, Dominique Van Der Streaten, Heribert Hirt, and Jean Colcombet

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[OPEN] Regulation of Strigolactone Biosynthesis by Gibberellin Signaling. Shinsaku Ito, Daichi Yamagami, Mikihisa Umehara, Atsushi Hanada, Satoko Yoshida, Yasuyuki Sasaki, Shunsuke Yajima, Junko Kyojuka, Miyako Ueguchi-Tanaka, Makoto Matsuoka, Ken Shirasu, Shinjiro Yamaguchi, and Tadao Asami

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Brassinosteroid Biosynthesis Is Modulated via a Transcription Factor Cascade of COG1, PIF4, and PIF5. *Zhuoyun Wei, Tong Yuan, Danuše Tarkowská, Jeongsik Kim, Hong Gil Nam, Ondřej Novák, Kai He, Xiaoping Gou, and Jia Li*

*Transcriptional control of brassinosteroid biosynthesis genes engages a transcription factor cascade in Arabidopsis.*

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Tetrahydrofolate Modulates Floral Transition through Epigenetic Silencing. *Lei Wang, Dongdong Kong, Qiang Lv, Guoqi Niu, Tingting Han, Xuanchao Zhao, Shulin Meng, Qian Cheng, Shouchun Guo, Jing Du, Zili Wu, Jinzheng Wang, Fang Bao, Yong Hu, Xiaojun Pan, Jinchan Xia, Dong Yuan, Lida Han, Tong Lian, Chunyi Zhang, Haiyang Wang, Xin-Jian He, and Yi-kun He*

*Folate regulates DNA methylation to affect Arabidopsis flowering time.*

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