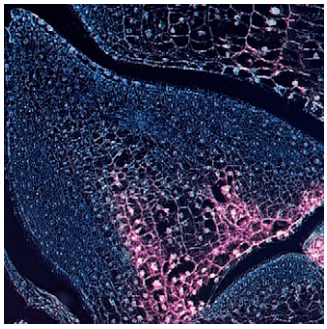
THE
PLANT
CELL

Volume 22 Number 7 July 2010

The electronic form of this issue, available at www.plantcell.org, is the journal of record.

ON THE COVER



Several monocot species develop unifacial leaves, in which leaf blades have only abaxial identity. Bifacial leaves require adaxial-abaxial polarity for leaf blade flattening, whereas many unifacial leaves become flattened despite their leaf blades being abaxialized. Yamaguchi et al. (pages 2141–2155) identify a *DROOPING LEAF* (*DL*) gene ortholog as a candidate responsible for leaf blade flattening in unifacial leaves of *Juncus prismatocarpus*. They suggest that *DL* promotes leaf cell proliferation along the median plane in monocots and that such *DL* function leads to leaf blade flattening in unifacial leaves, whereas it leads to leaf midrib formation in bifacial leaves. The cover image shows in situ localization of the *DL* transcripts (the pink color) in a longitudinal section of *J. prismatocarpus* shoot apex.

IN BRIEF

***YABBY* Genes and the Development and Origin of Seed Plant Leaves** 2103
Nancy A. Eckardt

The Podostemad Puzzle: The Evolution of Unusual Morphology in the Podostemaceae 2104
Nancy A. Eckardt and David Baum

PERSPECTIVE

Heterosis 2105
James A. Birchler, Hong Yao, Sivanandan Chudalayandi, Daniel Vaiman, and Reiner A. Veitia

RESEARCH ARTICLES

Differentiating Arabidopsis Shoots from Leaves by Combined YABBY Activities W OA 2113
Rajani Sarojam, Pia G. Sappl, Alexander Goldshmidt, Idan Efroni, Sandra K. Floyd, Yuval Eshed, and John L. Bowman

Expression of *SHOOT MERISTEMLESS*, *WUSCHEL*, and *ASYMMETRIC LEAVES1* Homologs in the Shoots of Podostemaceae: Implications for the Evolution of Novel Shoot Organogenesis W 2131
Natsu Katayama, Satoshi Koi, and Masahiro Kato

Genetic Framework for Flattened Leaf Blade Formation in Unifacial Leaves of *Juncus prismatocarpus* C W OA 2141
Takahiro Yamaguchi, Satoshi Yano, and Hirokazu Tsukaya

Orchestration of the Floral Transition and Floral Development in *Arabidopsis* by the Bifunctional Transcription Factor APETALA2 W OA 2156
Levi Yant, Johannes Mathieu, Thanh Theresa Dinh, Felix Ott, Christa Lanz, Heike Wollmann, Xuemei Chen, and Markus Schmid

Environmental Regulation of Lateral Root Emergence in *Medicago truncatula* Requires the HD-Zip I Transcription Factor HB1 W 2171
Federico Ariel, Anouck Diet, Marion Verdenaud, Véronique Gruber, Florian Frugier, Raquel Chan, and Martin Crespi

Natural Variation of Transcriptional Auxin Response Networks in *Arabidopsis thaliana* C W OA 2184
Carolin Delker, Yvonne Pöschl, Anja Raschke, Kristian Ullrich, Stefan Ettingshausen, Valeska Hauptmann, Ivo Grosse, and Marcel Quint

Evidence for Light Wavelength-Specific Photoelectrophysiological Signaling and Memory of Excess Light Episodes in *Arabidopsis* W OA **2201**
Magdalena Szechyńska-Hebda, Jerzy Kruk, Magdalena Górecka, Barbara Karpińska, and Stanisław Karpiński

The bHLH Transcription Factor POPEYE Regulates Response to Iron Deficiency in *Arabidopsis* Roots W OA **2219**
Terri A. Long, Hironaka Tsukagoshi, Wolfgang Busch, Brett Lahner, David E. Salt, and Philip N. Benfey

***Arabidopsis* PCR2 Is a Zinc Exporter Involved in Both Zinc Extrusion and Long-Distance Zinc Transport** W **2237**
Won-Yong Song, Kwan Sam Choi, Do Young Kim, Markus Geisler, Jiyoung Park, Vincent Vincenzetti, Maja Schellenberg, Sun Ha Kim, Yong Pyo Lim, Eun Woon Noh, Youngsook Lee, and Enrico Martinoia

Crossovers Get a Boost in *Brassica* Allotriploid and Allotetraploid Hybrids W **2253**
Martine Leflon, Laurie Grandont, Frédérique Eber, Virginie Huteau, Olivier Coriton, Liudmila Chelysheva, Eric Jenczewski, and Anne-Marie Chèvre

Repeated Polyploidy Drove Different Levels of Crossover Suppression between Homoeologous Chromosomes in *Brassica napus* Allohaploids C W **2265**
Marta Cifuentes, Frédérique Eber, Marie-Odile Lucas, Maryse Lode, Anne-Marie Chèvre, and Eric Jenczewski

Fast Diploidization in Close Mesopolyploid Relatives of *Arabidopsis* W OA **2277**
Terezie Mandáková, Simon Joly, Martin Krzywinski, Klaus Mummenhoff, and Martin A. Lysak

The CURLY LEAF Interacting Protein BLISTER Controls Expression of Polycomb-Group Target Genes and Cellular Differentiation of *Arabidopsis thaliana* C W **2291**
Nicole Schatlowski, Yvonne Stahl, Mareike L. Hohenstatt, Justin Goodrich, and Daniel Schubert

Regulation of Cell Proliferation in the Stomatal Lineage by the *Arabidopsis* MYB FOUR LIPS via Direct Targeting of Core Cell Cycle Genes W **2306**
Zidian Xie, EunKyoung Lee, Jessica R. Lucas, Kengo Morohashi, Dongmei Li, James A.H. Murray, Fred D. Sack, and Erich Grotewold

Temporal Control of Trichome Distribution by MicroRNA156-Targeted *SPL* Genes in *Arabidopsis thaliana* W OA **2322**
Nan Yu, Wen-Juan Cai, Shucai Wang, Chun-Min Shan, Ling-Jian Wang, and Xiao-Ya Chen

DNA Replication Factor C1 Mediates Genomic Stability and Transcriptional Gene Silencing in *Arabidopsis* W OA **2336**
Qian Liu, Junguo Wang, Daisuke Miki, Ran Xia, Wenxiang Yu, Junna He, Zhimin Zheng, Jian-Kang Zhu, and Zhizhong Gong

***Arabidopsis* Cockayne Syndrome A-Like Proteins 1A and 1B Form a Complex with CULLIN4 and Damage DNA Binding Protein 1A and Regulate the Response to UV Irradiation** W **2353**
Caiguo Zhang, Huiping Guo, Jun Zhang, Guangqin Guo, Karen S. Schumaker, and Yan Guo

***Arabidopsis* PHYTOCHROME INTERACTING FACTOR Proteins Promote Phytochrome B Polyubiquitination by COP1 E3 Ligase in the Nucleus** C W **2370**
In-Cheol Jang, Rossana Henriques, Hak Soo Seo, Akira Nagatani, and Nam-Hai Chua

Ethylene-Induced Stabilization of ETHYLENE INSENSITIVE3 and EIN3-LIKE1 Is Mediated by Proteasomal Degradation of EIN3 Binding F-Box 1 and 2 That Requires EIN2 in *Arabidopsis* C W **2384**
Fengying An, Qiong Zhao, Yusi Ji, Wenyang Li, Zhiqiang Jiang, Xiangchun Yu, Chen Zhang, Ying Han, Wenrong He, Yidong Liu, Shuqun Zhang, Joseph R. Ecker, and Hongwei Guo

The Levels of Male Gametic Mitochondrial DNA Are Highly Regulated in Angiosperms with Regard to Mitochondrial Inheritance [W] 2402
Dan-Yang Wang, Quan Zhang, Yang Liu, Zhi-Fu Lin, Shao-Xiang Zhang, Meng-Xiang Sun, and Sodmergen

Spatial Uncoupling of Mitosis and Cytokinesis during Appressorium-Mediated Plant Infection by the Rice Blast Fungus *Magnaporthe oryzae* [W] 2417
Diane G.O. Saunders, Yasin F. Dagdas, and Nicholas J. Talbot

Entry Mode–Dependent Function of an Indole Glucosinolate Pathway in Arabidopsis for Nonhost Resistance against Anthracnose Pathogens [W] 2429
Kei Hiruma, Mariko Onozawa-Komori, Fumika Takahashi, Makoto Asakura, Paweł Bednarek, Tetsuro Okuno, Paul Schulze-Lefert, and Yoshitaka Takano

Activation of an *Arabidopsis* Resistance Protein Is Specified by the in Planta Association of Its Leucine-Rich Repeat Domain with the Cognate Oomycete Effector [W] [OA] 2444
Ksenia V. Krasileva, Douglas Dahlbeck, and Brian J. Staskawicz

A Nitrogen Response Pathway Regulates Virulence Functions in *Fusarium oxysporum* via the Protein Kinase TOR and the bZIP Protein MeaB [C] [W] 2459
Manuel S. López-Berges, Nicolas Rispail, Rafael C. Prados-Rosales, and Antonio Di Pietro

The Myosin Motor Domain of Fungal Chitin Synthase V Is Dispensable for Vesicle Motility but Required for Virulence of the Maize Pathogen *Ustilago maydis* [W] 2476
Steffi Treitschke, Gunther Doehlemann, Martin Schuster, and Gero Steinberg

The Tig1 Histone Deacetylase Complex Regulates Infectious Growth in the Rice Blast Fungus *Magnaporthe oryzae* [C] [W] [OA] 2495
Sheng-Li Ding, Wende Liu, Anton Iliuk, Cecile Ribot, Julie Vallet, Andy Tao, Yang Wang, Marc-Henri Lebrun, and Jin-Rong Xu

***NENA*, a *Lotus japonicus* Homolog of *Sec13*, Is Required for Rhizodermal Infection by Arbuscular Mycorrhiza Fungi and Rhizobia but Dispensable for Cortical Endosymbiotic Development** [C] [W] 2509
Martin Groth, Naoya Takeda, Jillian Perry, Hisaki Uchida, Stephan Dräxl, Andreas Brachmann, Shusei Sato, Satoshi Tabata, Masayoshi Kawaguchi, Trevor L. Wang, and Martin Parniske

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

[W] Online version contains Web-only data.

[OA] Open Access articles can be viewed online without a subscription.

The Plant Cell (ISSN 1040-4651, online ISSN 1531-298X) is published monthly (one volume per year) by the American Society of Plant Biologists, 15501 Monona Drive, Rockville, MD 20855-2768, and is produced by Dartmouth Journal Services, Waterbury, VT. The institutional price for the print and online versions is based on type of institution; contact institution@aspb.org. A subscription includes both *The Plant Cell* and *Plant Physiology;* single copies may be purchased for $95 each, plus $10 shipping (U.S.) or $12 (outside U.S.). Members of the American Society of Plant Biologists may subscribe to *The Plant Cell* for $185. Nonmember individuals may subscribe for $375. For matters regarding subscriptions, contact Suzanne Cholwek, ASPB, 15501 Monona Drive, Rockville, MD 20855-2768; telephone 301/296-0926; fax 301/251-6740; e-mail scholwek@aspb.org. Notify ASPB in writing within 3 months (domestic) or 6 months (foreign) of issue date, and defective copies or copies lost in the mail will be replaced. Send all inquiries regarding display advertising to FASEB AdNet, 9650 Rockville Pike, Bethesda, MD 20814-3998; telephone 301/634-7791; fax 301/634-7153; e-mail adnet@faseb.org. Periodicals postage paid at Rockville, MD 20850, and at additional mailing offices.

Postmaster: Send address changes to *The Plant Cell,* American Society of Plant Biologists, 15501 Monona Drive, Rockville, MD 20855-2768. The online version of *The Plant Cell* is available at www.plantcell.org.