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On the Cover: Leaf venation of a sycamore tree (*Acer pseudoplatanus*). Photograph by Tom Donald (<http://www.flickr.com/clearwood>), a Scottish photographer and frequent contributor to The Plant Cell's *Teaching Tools in Plant Science* series.

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GoldenBraid 2.0 is a comprehensive technological framework that facilitates the construction of increasingly complex multigene structures and exchange of genetic building blocks. 1618

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BIOCHEMISTRY AND METABOLISM

^[W]^[OA]Diurnal Changes of Polysome Loading Track Sucrose Content in the Rosette of Wild-Type Arabidopsis and the Starchless *pgm* Mutant. Sunil Kumar Pal, Magdalena Liput, Maria Piques, Hirofumi Ishihara, Toshihiro Obata, Marina C.M. Martins, Ronan Sulpice, Joost T. van Dongen, Alisdair R. Fernie, Umesh Prasad Yadav, John E. Lunn, Björn Usadel, and Mark Stitt

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^[W]^[OA]Whole-Genome Mapping of Agronomic and Metabolic Traits to Identify Novel Quantitative Trait Loci in Bread Wheat Grown in a Water-Limited Environment. Camilla B. Hill, Julian D. Taylor, James Edwards, Diane Mather, Antony Bacic, Peter Langridge, and Ute Roessner

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^[W]The SUGAR-DEPENDENT1 Lipase Limits Triacylglycerol Accumulation in Vegetative Tissues of Arabidopsis. *Amélie A. Kelly, Harrie van Erp, Anne-Laure Quettier, Eve Shaw, Guillaume Menard, Smita Kurup, and Peter J. Eastmond*

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^[W]Comprehensive Dissection of Spatiotemporal Metabolic Shifts in Primary, Secondary, and Lipid Metabolism during Developmental Senescence in Arabidopsis. *Mutsumi Watanabe, Salma Balazadeh, Takayuki Tohge, Alexander Erban, Patrick Giavalisco, Joachim Kopka, Bernd Mueller-Roeber, Alisdair R. Fernie, and Rainer Hoefgen*

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^[W]A Redox 2-Cys Mechanism Regulates the Catalytic Activity of Divergent Cyclophilins. *Bruna Medéia Campos, Mauricio Luis Sforça, Andre Luis Berteli Ambrosio, Mariane Noronha Domingues, Tatiana de Arruda Campos Brasil de Souza, João Alexandre Ribeiro Gonçalves Barbosa, Adriana Franco Paes Leme, Carlos Alberto Perez, Sara Britt-Marie Whittaker, Mario Tyago Murakami, Ana Carolina de Matos Zeri, and Celso Eduardo Benedetti*

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^{[C][W][IOA]}A Common Fungal Associate of the Spruce Bark Beetle Metabolizes the Stilbene Defenses of Norway Spruce. *Almuth Hammerbacher, Axel Schmidt, Namita Wadke, Louwranse P. Wright, Bernd Schneider, Joerg Bohlmann, Willi A. Brand, Trevor M. Fenning, Jonathan Gershenzon, and Christian Paetz*

*The bark beetle-vectored fungus *Ceratocystis polonica* degrades stilbenoid defense compounds produced by its conifer host.* 1324

^{[C][W][IOA]}Comparative Transcriptome Analysis of Three Oil Palm Fruit and Seed Tissues That Differ in Oil Content and Fatty Acid Composition. *Stéphane Dussert, Chloé Guerin, Mariette Andersson, Thierry Joët, Timothy J. Tranbarger, Maxime Pizot, Gautier Sarah, Alphonse Omore, Tristan Durand-Gasselín, and Fabienne Morcillo*

Tissue-specific transcriptional regulation determines the differences in oil content and fatty acid composition of oil palm fruit and seed tissues. 1337

CELL BIOLOGY

^{[W][IOA]}Nonredundant Function of Zeins and Their Correct Stoichiometric Ratio Drive Protein Body Formation in Maize Endosperm. *Xiaomei Guo, Lingling Yuan, Han Chen, Shirley J. Sato, Thomas E. Clemente, and David R. Holding*

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^{[W][IOA]}Coordination of Leaf Photosynthesis, Transpiration, and Structural Traits in Rice and Wild Relatives (Genus *Oryza*). *Rita Giuliani, Nuria Koteyeva, Elena Voznesenskaya, Marc A. Evans, Asaph B. Cousins, and Gerald E. Edwards*

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^{[W][IOA]}Abscisic Acid Mediates a Divergence in the Drought Response of Two Conifers. *Timothy J. Brodribb and Scott A.M. McAdam*

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[W][OA]Arabidopsis Enhanced Drought Tolerance1/HOMEODOMAIN GLABROUS11 Confers Drought Tolerance in Transgenic Rice without Yield Penalty. Linhui Yu, Xi Chen, Zhen Wang, Shimei Wang, Yuping Wang, Qisheng Zhu, Shigui Li, and Chengbin Xiang

AtEDT1/HDG11 improves stress tolerance and grain yield in rice. 1378

[C][W][OA]PYR/RCAR Receptors Contribute to Ozone-, Reduced Air Humidity-, Darkness-, and CO₂-Induced Stomatal Regulation. Ebe Merilo, Kristiina Laanemets, Honghong Hu, Shaowu Xue, Liina Jakobson, Ingmar Tulva, Miguel Gonzalez-Guzman, Pedro L. Rodriguez, Julian I. Schroeder, Mikael Brosché, and Hannes Kollist

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[C][W][OA]Localized Induction of the ATP-Binding Cassette B19 Auxin Transporter Enhances Adventitious Root Formation in Arabidopsis. Poornima Sukumar, Gregory S. Maloney, and Gloria K. Muday

Localized synthesis of an auxin transport enhances local IAA accumulation in excised Arabidopsis hypocotyls and drives the formation of adventitious roots. 1392

[W]The Moss *Physcomitrella patens* Reproductive Organ Development Is Highly Organized, Affected by the Two SHI/STY Genes and by the Level of Active Auxin in the SHI/STY Expression Domain. Katarina Landberg, Eric R.A. Pederson, Tom Viaene, Behruz Bozorg, Jiří Friml, Henrik Jönsson, Mattias Thelander, and Eva Sundberg

Reproductive organ development of the moss Physcomitrella patens is affected by two SHI/STY genes and the plant hormone auxin. 1406

[C][W][OA]Functional Implication of β -Carotene Hydroxylases in Soybean Nodulation. Yun-Kyoung Kim, Sunghan Kim, Ji-Hyun Um, Kyunga Kim, Sun-Kang Choi, Byung-Hun Um, Suk-Woo Kang, Jee-Woong Kim, Shinichi Takaichi, Seok-Bo Song, Choon-Hwan Lee, Ho-Seung Kim, Ki Woo Kim, Kyoung Hee Nam, Suk-Ha Lee, Yul-Ho Kim, Hyang-Mi Park, Sun-Hwa Ha, Desh Pal S. Verma, and Choong-Il Cheon

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[W][OA]Redox Modulation of Plant Developmental Regulators from the Class I TCP Transcription Factor Family. Ivana L. Viola, Leandro N. Güttlein, and Daniel H. Gonzalez

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[W][OA]Suspensor Length Determines Developmental Progression of the Embryo in Arabidopsis. Yashodar Babu, Thomas Musielak, Agnes Henschen, and Martin Bayer

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[W][OA]The role of TIR-NBS and TIR-X proteins in plant basal defense responses. Raja Sekhar Nandety, Jeffery L. Caplan, Keri Cavanaugh, Bertrand Perroud, Tadeusz Wroblewski, Richard W. Michelmore, and Blake C. Meyers

TIR-NBS and TIR-X proteins are novel plant proteins with activities indicative of roles in plant defense. 1459

^{[C][W]}The Cotton Transcription Factor TCP14 Functions in Auxin-Mediated Epidermal Cell Differentiation and Elongation. *Miao-Ying Wang, Pi-Ming Zhao, Huan-Qing Cheng, Li-Bo Han, Xiao-Min Wu, Peng Gao, Hai-Yun Wang, Chun-Lin Yang, Nai-Qin Zhong, Jian-Ru Zuo, and Gui-Xian Xia*

GhTCP14 is a dual-function transcription factor able to positively or negatively regulate expression of auxin response and transporter genes, and it may act as a crucial regulator in auxin-mediated differentiation and elongation of cotton fiber cells.

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MEMBRANES, TRANSPORT, AND BIOENERGETICS

^{[C][W]}Mutually Exclusive Alterations in Secondary Metabolism Are Critical for the Uptake of Insoluble Iron Compounds by *Arabidopsis* and *Medicago truncatula*. *Jorge Rodríguez-Celma, Wen-Dar Lin, Guin-Mau Fu, Javier Abadía, Ana-Flor López-Míllán, and Wolfgang Schmidt*

Coexpression and promoter analysis under iron deficiency in roots of Arabidopsis and Medicago demonstrates the integral role for production and secretion of compounds that facilitate the uptake of reduction-based iron acquisition.

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^[W]Vacuolar Transport of the Medicinal Alkaloids from *Catharanthus roseus* Is Mediated by a Proton-Driven Antiport. *Inês Carqueijeiro, Henrique Noronha, Patrícia Duarte, Hernâni Gerós, and Mariana Sottomayor*

A specific H⁺ antiport system mediates the vacuolar uptake of terpenoid indole alkaloids in Catharanthus roseus.

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^{[W][OA]}Glutamate Receptor-Like Channel3.3 Is Involved in Mediating Glutathione-Triggered Cytosolic Calcium Transients, Transcriptional Changes, and Innate Immunity Responses in *Arabidopsis*. *Feng Li, Jing Wang, Chunli Ma, Yongxiu Zhao, Yingchun Wang, Agula Hasi, and Zhi Qi*

Extracellular glutathione triggers innate immunity responses in the Arabidopsis leaf through a glutamate receptor3.3-dependent pathway homologous with that of the central nervous system.

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^{[C][W][OA]}A Suppressor Screen of the Chimeric *AtCNGC11/12* Reveals Residues Important for Intersubunit Interactions of Cyclic Nucleotide-Gated Ion Channels. *Huda Abdel-Hamid, Kimberley Chin, Wolfgang Moeder, Dea Shahinas, Deepali Gupta, and Keiko Yoshioka*

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^{[C][W][OA]}Structural Determinants at the Interface of the ARC2 and Leucine-Rich Repeat Domains Control the Activation of the Plant Immune Receptors Rx1 and Gpa2. *Erik J. Slootweg, Laurentiu N. Spiridon, Jan Roosien, Patrick Butterbach, Rikus Pomp, Lotte Westerhof, Ruud Wilbers, Erin Bakker, Jaap Bakker, Andrei-José Petrescu, Geert Smant, and Aska Goverse*

Cooperative interactions between the sensor domain and the molecular switch domain of plant immune receptors are structurally defined.

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^{[W][OA]}TWIN SISTER OF FT, GIGANTEA, and CONSTANS Have a Positive But Indirect Effect on Blue Light-Induced Stomatal Opening in *Arabidopsis*. *Eigo Ando, Masato Ohnishi, Yin Wang, Tomonao Matsushita, Aiko Watanabe, Yuki Hayashi, Miho Fujii, Jian Feng Ma, Shin-ichiro Inoue, and Toshinori Kinoshita*

Stomatal opening is indirectly modulated by a mechanism similar to that of the photoperiodic floral transition.

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^{[C][W][OA]}Phototropins Function in High-Intensity Blue Light-Induced Hypocotyl Phototropism in *Arabidopsis* by Altering Cytosolic Calcium. *Xiang Zhao, Yan-Liang Wang, Xin-Rong Qiao, Jin Wang, Lin-Dan Wang, Chang-Shui Xu, and Xiao Zhang*

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- [W][OA] Interplay between Sucrose and Folate Modulates Auxin Signaling in Arabidopsis. *Michael E. Stokes, Abhishek Chattopadhyay, Olivia Wilkins, Eiji Nambara, and Malcolm M. Campbell*
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- [W][OA] The Arabidopsis ETHYLENE RESPONSE FACTOR1 Regulates Abiotic Stress-Responsive Gene Expression by Binding to Different cis-Acting Elements in Response to Different Stress Signals. *Mei-Chun Cheng, Po-Ming Liao, Wei-Wen Kuo, and Tsan-Piao Lin*
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- [W][OA] Growth Platform-Dependent and -Independent Phenotypic and Metabolic Responses of Arabidopsis and Its Halophytic Relative, *Eutrema salsugineum*, to Salt Stress. *Yana Kazachkova, Albert Batushansky, Aroldo Cisneros, Noemi Tel-Zur, Aaron Fait, and Simon Barak*
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- [C][W][OA] Regulation of Transcription of Nucleotide-Binding Leucine-Rich Repeat-Encoding Genes *SNC1* and *RPP4* via H3K4 Trimethylation. *Shitou Xia, Yu Ti Cheng, Shuai Huang, Joe Win, Avril Soards, Tsung-Luo Jinn, Jonathan D.G. Jones, Sophien Kamoun, She Chen, Yuelin Zhang, and Xin Li*
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- [W][OA] The Trehalose 6-Phosphate/SnRK1 Signalling Pathway Primes Growth Recovery following Relief of Sink Limitation. *Cátia Nunes, Liam E. O'Hara, Lucia F. Primavesi, Thierry L. Delatte, Henriette Schluempmann, Govert W. Somsen, Anabela B. Silva, Pedro S. Feveiro, Astrid Wingler, and Matthew J. Paul*
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- [W][OA] System-Wide Hypersensitive Response-Associated Transcriptome and Metabolome Reprogramming in Tomato. *Desalegn W. Etalo, Iris J.E. Stulemeijer, H. Peter van Esse, Ric C.H. de Vos, Harro J. Bouwmeester, and Matthieu H.A.J. Joosten*
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- [C][W][OA] The Arabidopsis RING E3 Ubiquitin Ligase *AtAIRP3/LOG2* Participates in Positive Regulation of High-Salt and Drought Stress Responses. *Jong Hum Kim and Woo Taek Kim*
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- [C][W] Genome-Wide Detection of Condition-Sensitive Alternative Splicing in Arabidopsis Roots. *Wenfeng Li, Wen-Dar Lin, Prasun Ray, Ping Lan, and Wolfgang Schmidt*
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Short- and Long-Term Operation of the Lutein-Epoxyde Cycle in Light-Harvesting Antenna Complexes. *Matsubara S., Morosinotto T., Osmond C.B., and Bassi R.*

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