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**On the Cover:** Mutant analysis is a fruitful way to identify the function of genes and uncover novel metabolic, developmental, and cellular processes. The traditional reverse genetic approach of assaying a small number of phenotypes on plants defective in one or a few genes often leads to detection of no mutant phenotype. It also limits the ability to discover broader syndromes and connections between genes. The article by Lu et al. in this issue (pp. 1482–1500) describes a study that industrializes the process of mutant screening. A functional genomics pipeline approach is described for analysis of 13 previously studied mutants and >100 wild-type plants for a wide variety of phenotypic traits. The study uncovered previously unreported phenotypes for these well-characterized mutants and unexpected associations between different physiological processes. Cover design by Chris Smith at fivethirtythree studios.

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- <sup>[W]</sup>Arabidopsis NAD-Malic Enzyme Functions As a Homodimer and Heterodimer and Has a Major Impact on Nocturnal Metabolism. *Marcos A. Tronconi, Holger Fahnenstich, Mariel C. Gerrard Weehler, Carlos S. Andreo, Ulf-Ingo Flügge, María F. Drincovich, and Verónica G. Maurino* 1540
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- <sup>[OA]</sup>Starch Biosynthetic Enzymes from Developing Maize Endosperm Associate in Multisubunit Complexes. *Tracie A. Hennen-Bierwagen, Fushan Liu, Rebekah S. Marsh, Seungtaek Kim, Qinglei Gan, Ian J. Tetlow, Michael J. Emes, Martha G. James, and Alan M. Myers* 1892
- Proteinase Inhibitor from Ginkgo Seeds Is a Member of the Plant Nonspecific Lipid Transfer Protein Gene Family. *Yoriko Sawano, Ken-ichi Hatano, Takuya Miyakawa, Hideki Komagata, Yumiko Miyauchi, Hiroshi Yamazaki, and Masaru Tanokura* 1909

## BIOENERGETICS AND PHOTOSYNTHESIS

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## ENVIRONMENTAL STRESS AND ADAPTATION TO STRESS

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<sup>[W]</sup>Functional Conservation of Clock-Related Genes in Flowering Plants: Overexpression and RNA Interference Analyses of the Circadian Rhythm in the Monocotyledon *Lemna gibba*. *Masayuki Serikawa, Kumiko Miwa, Takao Kondo, and Tokitaka Oyama* 1952

<sup>[W][OAI]</sup>Iron-Induced Turnover of the Arabidopsis IRON-REGULATED TRANSPORTER1 Metal Transporter Requires Lysine Residues. *Loubna Kerkeb, Indrani Mukherjee, Iera Chatterjee, Brett Lahner, David E. Salt, and Erin L. Connolly* 1964

## GENETICS, GENOMICS, AND MOLECULAR EVOLUTION

<sup>[W][OAI]</sup>Barley Grain Maturation and Germination: Metabolic Pathway and Regulatory Network Commonalities and Differences Highlighted by New MapMan/PageMan Profiling Tools. *Nese Sreenivasulu, Björn Usadel, Andreas Winter, Volodymyr Radchuk, Uwe Scholz, Nils Stein, Winfriede Weschke, Marc Strickert, Timothy J. Close, Mark Stitt, Andreas Graner, and Ulrich Wobus* 1738

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<sup>[W]</sup>Sequence Variation of MicroRNAs and Their Binding Sites in Arabidopsis. *Ian M. Ehrenreich and Michael D. Purugganan* 1974

## PLANTS INTERACTING WITH OTHER ORGANISMS

- <sup>[W]</sup>Tomato Transcriptional Changes in Response to *Clavibacter michiganensis* subsp. *michiganensis* Reveal a Role for Ethylene in Disease Development. Vasudevan Balaji, Maya Mayrose, Ofra Sherf, Jasmine Jacob-Hirsch, Rudolf Eichenlaub, Naim Iraki, Shulamit Manulis-Sasson, Gideon Rechavi, Isaac Barash, and Guido Sessa 1797
- <sup>[W][OA]</sup>Herbivore-Induced Callose Deposition on the Sieve Plates of Rice: An Important Mechanism for Host Resistance. Peiyang Hao, Caixiang Liu, Yuanyuan Wang, Rongzhi Chen, Ming Tang, Bo Du, Lili Zhu, and Guangcun He 1810
- <sup>[C][W]</sup>A Novel WRKY Transcription Factor Is Required for Induction of *PR-1a* Gene Expression by Salicylic Acid and Bacterial Elicitors. Marcel C. van Verk, Dimitri Pappaioannou, Lyda Neeleman, John F. Bol, and Huub J.M. Linthorst 1983
- <sup>[W]</sup>Influence of Green Leaf Herbivory by *Manduca sexta* on Floral Volatile Emission by *Nicotiana suaveolens*. Uta Effmert, Claudia Dinse, and Birgit Piechulla 1996
- Differential Regulation of Root Arginine Catabolism and Polyamine Metabolism in Clubroot-Susceptible and Partially Resistant Arabidopsis Genotypes. Mélanie Jubault, Céline Hamon, Antoine Gravot, Christine Lariagon, Régine Delourme, Alain Bouchereau, and Maria J. Manzanares-Dauleux 2008

## SYSTEMS BIOLOGY, MOLECULAR BIOLOGY, AND GENE REGULATION

- <sup>[OA]</sup>The Genetics and Transcriptional Profiles of the Cellulose Synthase-Like *HvCslF* Gene Family in Barley. Rachel A. Burton, Stephen A. Jobling, Andrew J. Harvey, Neil J. Shirley, Diane E. Mather, Antony Bacic, and Geoffrey B. Fincher 1821
- <sup>[W][OA]</sup>Global Transcript Levels Respond to Small Changes of the Carbon Status during Progressive Exhaustion of Carbohydrates in Arabidopsis Rosettes. Björn Usadel, Oliver E. Bläsing, Yves Gibon, Kristin Retzlaff, Melanie Höhne, Manuela Günther, and Mark Stitt 1834
- <sup>[C][W][OA]</sup>DNA-Binding Study Identifies C-Box and Hybrid C/G-Box or C/A-Box Motifs as High-Affinity Binding Sites for STF1 and LONG HYPOCOTYL5 Proteins. Young Hun Song, Cheol Min Yoo, An Pio Hong, Seong Hee Kim, Hee Jeong Jeong, Su Young Shin, Hye Jin Kim, Dae-Jin Yun, Chae Oh Lim, Jeong Dong Bahk, Sang Yeol Lee, Ron T. Nagao, Joe L. Key, and Jong Chan Hong 1862
- <sup>[W]</sup>Systemic Signaling of the Plant Nitrogen Status Triggers Specific Transcriptome Responses Depending on the Nitrogen Source in *Medicago truncatula*. Sandrine Ruffel, Sandra Freixes, Sandrine Balzergue, Pascal Tillard, Christian Jeudy, Marie Laure Martin-Magniette, Margaretha J. van der Merwe, Klementina Kakar, Jérôme Gouzy, Alisdair R. Fernie, Michael Udvardi, Christophe Salon, Alain Gojon, and Marc Lepetit 2020
- <sup>[W]</sup>Oxidative Pentose Phosphate Pathway-Dependent Sugar Sensing as a Mechanism for Regulation of Root Ion Transporters by Photosynthesis. Laurence Lejay, Judith Wirth, Marjorie Pervent, Joanna Marie-France Cross, Pascal Tillard, and Alain Gojon 2036

## CORRECTIONS

- Arabidopsis Genes *AS1*, *AS2*, and *JAG* Negatively Regulate Boundary-Specifying Genes to Promote Sepal and Petal Development. B. Xu, Z. Li, Y. Zhu, H. Wang, H. Ma, A. Dong, and H. Huang 2054

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