

**On the Cover:** The phenolic polymer lignin provides strength for plants to conduct water and grow upright. Laccases and peroxidases are secreted oxidative enzymes involved in the final stage of lignin polymerization in cell walls, but large gene families and functional redundancy have made it difficult to identify the role of specific enzymes. Interestingly, different tagged laccases and peroxidases (red) localize to diverse regions of lignified cell walls (blue). While some localize to the thick secondary cell wall rich in cellulose and hemicellulose (top three rows: LAC4, LAC17, PRX72), others localize to the pectin-rich middle lamella and cell corners (bottom row, PRX64). The different localization patterns of these enzymes indicate that different isoforms may play distinct roles related to lignification in different cell types and regions of the cell wall. Image by: Natalie Hoffmann, Samuels Lab, University of British Columbia, Vancouver, Canada.

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[<sup>OPEN</sup>] An Ionic Liquid Extraction That Preserves the Molecular Structure of Cutin Shown by Nuclear Magnetic Resonance. Carlos J.S. Moreira, Artur Bento, Joana Pais, Johann Petit, Rita Escórcio, Vanessa G. Correia, Ângela Pinheiro, Lukasz P. Haliński, Oleksandr O. Mykhaylyk, Christophe Rothan, and Cristina Silva Pereira

*A simple ionic-liquid based extraction method enables recovery of a cutin biopolymer carrying distinct types of modifications (e.g. preservation of esters or cuticular polysaccharides).*

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[<sup>OPEN</sup>] Robust Survival-Based RNA Interference of Gene Families Using in Tandem Silencing of Adenine Phosphoribosyltransferase. Robert G. Orr, Stephen J. Foley, Catherine Sherman, Isidro Abreu, Giulia Galotto, Boyuan Liu, Manuel González-Guerrero, and Luis Vidali

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[<sup>OPEN</sup>] BonnMu: A Sequence-Indexed Resource of Transposon-Induced Maize Mutations for Functional Genomics Studies. Caroline Marcon, Lena Altrogge, Yan Naing Win, Tyll Stöcker, Jack M. Gardiner, John L. Portwood II, Nina Opitz, Annika Kortz, Jutta A. Baldauf, Charles T. Hunter, Donald R. McCarty, Karen E. Koch, Heiko Schoof, and Frank Hochholdinger

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The Multisite PeachRefPop Collection: A True Cultural Heritage and International Scientific Tool for Fruit Trees. Marco Cirilli, Sabrina Micali, Maria José Aranzana, Pere Arús, Annarosa Babini, Teresa Barreneche, Marco Bink, Celia M. Cantin, Angelo Ciacciulli, José Enrique Cos-Terrer, Paulina Drogoudi, Iban Eduardo, Stefano Foschi, Daniela Giovannini, Walter Guerra, Alessandro Liverani, Igor Pacheco, Thierry Pascal, Benedicte Quilot-Turion, Ignazio Verde, Laura Rossini, and Daniele Bassi

*Realization of the PeachRefPop, the international multisite reference collection in peach, provides an invaluable tool for scientific studies in perennial species.*

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[<sup>OPEN</sup>] Carbon Dots for Efficient Small Interfering RNA Delivery and Gene Silencing in Plants. Steven H. Schwartz, Bill Hendrix, Paul Hoffer, Rick A. Sanders, and Wei Zheng

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[<sup>OPEN</sup>] MYB30 Orchestrates Systemic Reactive Oxygen Signaling and Plant Acclimation. Yosef Fichman, Sara I. Zandalinas, Soham Sengupta, David Burks, Ronald J. Myers Jr, Rajeev K. Azad, and Ron Mittler

*The transcriptional regulator MYB30 links systemic reactive oxygen species signaling with systemic acquired acclimation during the response of Arabidopsis to excess light stress.*

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[<sup>OPEN</sup>] Redox Modification of the Iron-Sulfur Glutaredoxin GRXS17 Activates Holdase Activity and Protects Plants from Heat Stress. Laura Martins, Johannes Knuesting, Laetitia Bariat, Avilien Dard, Sven A. Freibert, Christophe H. Marchand, David Young, Nguyen Ho Thuy Dung, Wilhelm Voth, Anne Debures, Julio Saez-Vasquez, Stéphane D. Lemaire, Roland Lill, Joris Messens, Renate Scheibe, Jean-Philippe Reichheld, and Christophe Riondet

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*A transcript repressor is responsible for the normal development of spikelet and floral organs in rice and can be used in breeding design to improve yield.*

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**[CC-BY] Duplication of Symbiotic Lysin Motif Receptors Predates the Evolution of Nitrogen-Fixing Nodule Symbiosis** Luuk Rutten, Kana Miyata, Yuda Purwana Roswanjaya, Rik Huisman, Fengjiao Bu, Marijke Hartog, Sidney Linders, Robin van Velzen, Arjan van Zeijl, Ton Bisseling, Wouter Kohlen, and Rene Geurts

*Four lysin motif receptor kinases controlling rhizobium nodule formation in the nonlegume Parasponia evolved after two ancient duplications.*

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**Pollen-Specific Protein PSP231 Activates Callose Synthesis to Govern Male Gametogenesis and Pollen Germination.** Yang Li, Li Li, Yao Wang, Ya-Chao Wang, Na-Na Wang, Rui Lu, Yu-Wei Wu, and Xue-Bao Li

*A pollen-specific protein activates callose synthases by sequestering an RNA binding protein away from the mRNA encoding a transcriptional repressor, leading to the callose synthesis and deposition required for male gametogenesis and pollen germination.*

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## MEMBRANES, TRANSPORT AND BIOENERGETICS

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*A polysaccharide acetyltransferase family gene plays a pivotal role in cell wall structure and is activated by MYC2-dependent jasmonate signaling, enhancing herbivore defense in Arabidopsis.*

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**[OPEN] The Histone-Modifying Complex PWR/HOS15/HD2C Epigenetically Regulates Cold Tolerance.** Chae Jin Lim, Junghoon Park, Mingzhe Shen, Hee Jin Park, Mi Sun Cheong, Ki Suk Park, Dongwon Baek, Min Jae Bae, Ahktar Ali, Masood Jan, Sang Yeol Lee, Byeong-ha Lee, Woe-Yeon Kim, Jose M. Pardo, and Dea-Jin Yun

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