

**On the Cover:** The cover shows a confocal image of a lateral root primordium emerging from the primary root in the model plant *Arabidopsis thaliana*. The proper development of lateral roots requires communication between cells and tissues over both short and long distances. It is becoming increasingly clear that a multitude of signaling peptides serve as molecular messengers that control several aspects of lateral root development (represented schematically), including lateral root spacing, initiation, primordium development, and its accommodation in the surrounding tissues. The cell walls were stained with Calcifluor White and are shown in white. Basic Fuchsin was used as a lignin stain to highlight the xylem which is shown in magenta. Image Credits: Joris Jourquin and Maria F. Njo.

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*Non-redundant roles are uncovered for rice GLUTAMINE SYNTHETASE1;1 and GLUTAMINE SYNTHETASE1;2 in metabolic homeostasis and chloroplast formation in rice seedling roots.* 1894

Two Plastid Fatty Acid Exporters Contribute to Seed Oil Accumulation in Arabidopsis. *Nannan Li, Hongjun Meng, Shengting Li, Zhen Zhang, Xin Zhao, Shufeng Wang, Aihui Liu, Qing Li, Qin Song, Xiaohong Li, Liang Guo, Hanwen Li, Jianru Zuo, and Keming Luo*  
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[<sup>OPEN</sup>] Moonlighting Function of Phytochelatin Synthase1 in Extracellular Defense against Fungal Pathogens. *Kian Hématy, Melisa Lim, Candice Cherk, Mariola Piślewska-Bednarek, Clara Sanchez-Rodriguez, Monica Stein, Rene Fuchs, Christine Klapprodt, Volker Lipka, Antonio Molina, Erwin Grill, Paul Schulze-Lefert, Paweł Bednarek, and Shauna Somerville*  
*PCS1 is a moonlighting protein that functions in abiotic stress response and is indispensable for proper extracellular immune responses and pathogen-triggered glucosinolate metabolism.* 1920

[<sup>OPEN</sup>] A Cytosol-Localized Geranyl Diphosphate Synthase from *Lithospermum erythrorhizon* and Its Molecular Evolution. *Hayato Ueoka, Kanako Sasaki, Tatsuya Miyawaki, Takuji Ichino, Kanade Tatsumi, Shiro Suzuki, Hirobumi Yamamoto, Nozomu Sakurai, Hideyuki Suzuki, Daisuke Shibata, and Kazufumi Yazaki*  
*A unique cytosol-localized geranyl diphosphate synthase supporting a large production of shikonin has evolved from farnesyl diphosphate synthase in *Lithospermum erythrorhizon*.* 1933

## CELL BIOLOGY

[<sup>OPEN</sup>] Arabidopsis XTH4 and XTH9 Contribute to Wood Cell Expansion and Secondary Wall Formation. *Sunita Kushwah, Alicja Banasiak, Nobuyuki Nishikubo, Marta Derba-Maceluch, Mateusz Majda, Satoshi Endo, Vikash Kumar, Leonardo Gomez, Andras Gorzsas, Simon McQueen-Mason, Janet Braam, Björn Sundberg, and Ewa J. Mellerowicz*  
*Xylem cell expansion and fiber intrusive tip growth require the activity of enzymes that rearrange xyloglucan in cell walls, and their deficiency not only affects cell expansion but alters subsequent secondary wall formation via cell wall integrity-sensing mechanisms.* 1946

PDV1 and PDV2 Differentially Affect Remodeling and Assembly of the Chloroplast DRP5B Ring. *Bing Sun, Qi-yang Zhang, Huan Yuan, Wei Gao, Bo Han, and Min Zhang*  
*The chloroplast outer envelope membrane protein PLASTID DIVISION2 (PDV2) and its paralog PDV1 modulate assembly and remodeling, respectively, of the dynamic DRP5B ring to guide chloroplast division.* 1966

[<sup>OPEN</sup>] ERdj3B-Mediated Quality Control Maintains Anther Development at High Temperatures. *Masaya Yamamoto, Shuhei Uji, Tomoyuki Sugiyama, Tomoaki Sakamoto, Seisuke Kimura, Toshiya Endo, and Shuh-ichi Nishikawa*  
*ER quality control mediated by ERdj3B is important for anther development at high temperature in Arabidopsis.* 1979

## ECOPHYSIOLOGY AND SUSTAINABILITY

Dehydration-Induced DnaK2 Chaperone Is Involved in PSII Repair of a Desiccation-Tolerant Cyanobacterium. *Hai-Feng Xu, Guo-Zheng Dai, De-Min Ye, Jin-Long Shang, Wei-Yu Song, Huazhong Shi, and Bao-Sheng Qiu*  
*The drought tolerance of the cyanobacterium *Nostoc flagelliforme* is enhanced by a dehydration-induced chaperone pair that is involved in photosystem II repair under stress conditions.* 1991

## GENES, DEVELOPMENT AND EVOLUTION

Comparative Expression Profiling Reveals Genes Involved in Megasporogenesis. *Heming Zhao, Mingliang Guo, Maokai Yan, Han Cheng, Yanhui Liu, Zeyuan She, Linyi Lai, Chao Shi, Minqian Zhang, Yi Li, Deshu Lin, and Yuan Qin*  
*Transcriptome analysis of young ovules points to a receptor-like kinase that is preferentially expressed in archesporial and megaspore mother cells and functions in female germline cell specification in rice.* 2006

Secondary Mutation-Induced Alternative Splicing Suppresses RNA Splicing Defect of the *jhs1* Mutant. *Yiqiong Li, Xiaomin Liu, Yuxuan Guo, Jianbo Xie, Lulu Wang, Qiankuo Chen, Guangshuai Wang, Zefeng Wang, and Hongbo Gao*  
*Secondary mutations in a splicing mutant correct the reading frame by switching the splice site again, and result in an insertion in a non-essential loop region of DNA2.* 2025

- [<sup>OPEN</sup>]Histone Acetylation at the Promoter for the Transcription Factor PuWRKY31 Affects Sucrose Accumulation in Pear Fruit. *Xinyue Li, Wei Guo, Juncai Li, Pengtao Yue, Haidong Bu, Jing Jiang, Weiting Liu, Yaxiu Xu, Hui Yuan, Tong Li, and Aide Wang*  
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- Differences in PpAAT1 Activity in High- and Low-Aroma Peach Varieties Affect  $\gamma$ -Decalactone Production. *Bin Peng, Mingliang Yu, Binbin Zhang, Jianlan Xu, and Ruijuan Ma*  
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- [<sup>OPEN</sup>]Class-I TCP Transcription Factors Activate the SAUR63 Gene Subfamily in Gibberellin-Dependent Stamen Filament Elongation. *Victoria Gastaldi, Leandro E. Lucero, Lucía V. Ferrero, Federico D. Ariel, and Daniel H. Gonzalez*  
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- [OPEN] Modification of the Expression of the Aquaporin ZmPIP2;5 Affects Water Relations and Plant Growth. *Lei Ding, Thomas Milhiet, Valentin Couvreur, Hilde Nelissen, Adel Meziane, Boris Parent, Stijn Aesaert, Mieke Van Lijsebettens, Dirk Inzé, François Tardieu, Xavier Draye, and François Chaumont*  
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- [OPEN] miR159 Represses a Constitutive Pathogen Defense Response in Tobacco. *Zihui Zheng, Naiqi Wang, Meachery Jalajakumari, Leila Blackman, Enhui Shen, Saurabh Verma, Ming-Bo Wang, and Anthony A. Millar*  
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