

**On the Cover:** Anthers develop from undifferentiated meristematic cells into an organized set of tissues that produce pollen in plants. The cover image shows a high-pressure frozen freeze-substituted pre-meiotic barley anther including middle layer (bright green), tapetum (yellow-green), nuclei (blue) and mitochondria (red). Original article by Bélanger et al. provides novel developmental insights and evolutionary significance of phasiRNA biogenesis in maize, barley and rice. Image credit: Sébastien Bélanger & Kirk J Czymmek.

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*Monokaryotic Chloroplast1 acts in recombination surveillance of plastid and mitochondrial DNA by preventing ectopic recombination between short dispersed repeats.* 1870

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## GENES, DEVELOPMENT AND EVOLUTION

[OPEN]Toward "Smart Canopy" Sorghum: Discovery of the Genetic Control of Leaf Angle Across Layers. *Maria Betsabe Mantilla-Perez, Yin Bao, Lie Tang, Patrick S. Schnable, and Maria G. Salas-Fernandez*  
*Leaf angle across the sorghum canopy is genetically controlled by both common and layer-specific loci, which holds potential for the development of an optimized canopy associated with higher yields.* 1927

[OPEN]Heterotrimeric G-Protein Interactions Are Conserved Despite Regulatory Element Loss in Some Plants. *Nikita Bhatnagar and Sona Pandey*  
*The functional networks between the G-protein  $\alpha$ -subunit and its regulatory protein, RGS, are conserved in plants, and despite the absence of RGS in many monocots, their corresponding G $\alpha$  proteins have retained the ability to be deactivated by nonnative RGS in planta.* 1941

- [OPEN] Changes in Alternative Splicing in Response to Domestication and Polyploidization in Wheat. *Kuohai Yu, Man Feng, Guanghui Yang, Lv Sun, Zhen Qin, Jie Cao, Jingjing Wen, Haoran Li, Yan Zhou, Xiangping Chen, Huiru Peng, Yingyin Yao, Zhaorong Hu, Weilong Guo, Qixin Sun, Zhongfu Ni, Keith Adams, and Mingming Xin*  
*Transcriptomic analyses of several wheat species with different ploidies reveal alternative splicing changes in domestication or polyploidization.* 1955
- [OPEN] The H3K27me3 Demethylase RELATIVE OF EARLY FLOWERING6 Suppresses Seed Dormancy by Inducing Abscisic Acid Catabolism. *Huhui Chen, Jianhua Tong, Wei Fu, Zhenwei Liang, Jiuxiao Ruan, Yaoguang Yu, Xin Song, Liangbing Yuan, Langtao Xiao, Jun Liu, Yuhai Cui, Shangzhi Huang, and Chenlong Li*  
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- A Missense Mutation in a Large Subunit of Ribonucleotide Reductase Confers Temperature-Gated Tassel Formation. *Shiyi Xie, Hongbing Luo, Yumin Huang, Yaxin Wang, Wei Ru, Yunlu Shi, Wei Huang, Hai Wang, Zhaobin Dong, and Weiwei Jin*  
*Temperature-dependent shoot apical meristem development is conferred by temperature-gated interactions between ribonucleotide reductase subunits.* 1979
- [OPEN] Origins and Evolution of Cuticle Biosynthetic Machinery in Land Plants. *Lingyao Kong, Yanna Liu, Pengfei Zhi, Xiaoyu Wang, Bo Xu, Zhizhong Gong, and Cheng Chang*  
*Portions of the cuticle biosynthetic machinery originated in the last common ancestor of embryophytes and underwent evolution and diversification in land plants.* 1998
- [OPEN] The PPR-SMR Protein ATP4 Is Required for Editing the Chloroplast *rps8* mRNA in Rice and Maize. *Jinghong Zhang, Yipo Guo, Qian Fang, Yongli Zhu, Yang Zhang, Xuejiao Liu, Yongjun Lin, Alice Barkan, and Fei Zhou*  
*The PPR-SMR protein ATP4 is required for RNA editing of the chloroplast encoded *rps8* gene in rice and maize, and the defect in *rps8* expression underlies a cold-sensitive phenotype in rice.* 2011
- [OPEN] SMALL ORGAN4 Is a Ribosome Biogenesis Factor Involved in 5.8S Ribosomal RNA Maturation. *Rosa Micol-Ponce, Raquel Sarmiento-Mañúis, Sara Fontcuberta-Cervera, Adrián Cabezas-Fuster, Anne de Bures, Julio Sáez-Vásquez, and María Rosa Ponce*  
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- [OPEN] PSI of the Colonial Alga *Botryococcus braunii* Has an Unusually Large Antenna Size. *Tomas E. van den Berg, Rameez Arshad, Wojciech J. Nawrocki, Egbert J. Boekema, Roman Kouřil, and Roberta Croce*  
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- [CC-BY] Spatial Profiles of Phosphate in Roots Indicate Developmental Control of Uptake, Recycling, and Sequestration. *Abira Sahu, Swayoma Banerjee, Aditi Subramani Raju, Tzyy-Jen Chiou, L. Rene Garcia, and Wayne K. Versaw*  
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