Plant cells frequently undergo endoreduplication, during which chromosomal DNA is successively duplicated in the absence of mitosis. It has been proposed that endoreduplication is regulated at its entry by mitotic cyclin-dependent kinase activity, but the regulatory mechanisms for its termination remain unclear. On pages 382–396, Imai et al. show that the A-type cyclin CYCA2;3 negatively regulates endocycles and acts as a key regulator of ploidy levels during endoreduplication in Arabidopsis. The authors found that the CYCA2;3 promoter is active in developing trichomes during the termination period of endoreduplication. Loss-of-function mutations of CYCA2;3 semidominantly promoted endocycles and increased the ploidy levels in mature organs but did not significantly affect the proportion of cells that underwent endoreduplication. In addition, expression of a CYCA2;3-GFP fusion protein restrained endocycles in a dose-dependent manner. The cover image shows a 4',6-diamidino-2-phenylindole-stained Arabidopsis trichome, which typically has a nuclear DNA content of 32C, in contrast with the 1C DNA content of a haploid genome.
Arabidopsis ACCELERATED CELL DEATH2 Modulates Programmed Cell Death
Nan Yao and Jean T. Greenberg

Regulation of Phosphate Homeostasis by MicroRNA in Arabidopsis
Tzyy-Jen Chiou, Kyaw Aung, Shu-I Lin, Chia-Chune Wu, Su-Fen Chiang, and Chun-Iin Su

Involvement of a Glycerol-3-Phosphate Dehydrogenase in Modulating the NADH/NAD⁺ Ratio Provides Evidence of a Mitochondrial Glycerol-3-Phosphate Shuttle in Arabidopsis
Wenyun Shen, Yangdong Wei, Melanie Dauk, Yinang Tan, David C. Taylor, Gopalan Selvaraj, and Jiatao Zou

ELONGATED UPPERMOST INTERNODE Encodes a Cytochrome P450 Monooxygenase That Epoxidizes Gibberellins in a Novel Deactivation Reaction in Rice
Yongyou Zhu, Takahito Nomura, Yonghan Xu, Yingying Zhang, Yu Peng, Binglei Mao, Atsushi Hanada, Haicheng Zhou, Renxia Wang, Peijin Li, Xudong Zhu, Lewis N. Mander, Yuji Kamiya, Shinjirou Yamaguchi, and Zuhua He

Mobilization of Photosystem II Induced by Intense Red Light in the Cyanobacterium Synechococcus sp PCC7942
Mary Sarcina, Nikolaos Bouzouvis, and Conrad W. Mullineux

The Arabidopsis Receptor Kinase FLS2 Binds flg22 and Determines the Specificity of Flagellin Perception
Delphine Chinchilla, Zsuzsa Bauer, Martin Regenass, Thomas Boiller, and Georg Felix

Arabidopsis TARGET OF RAPAMYCIN Interacts with RAPTOR, Which Regulates the Activity of S6 Kinase in Response to Osmotic Stress Signals
Magdy M. Mahfouz, Sunghan Kim, Ashton J. Delauney, and Desh Pal S. Verma

Elicitor-Mediated Oligomerization of the Tobacco N Disease Resistance Protein
Pere Mestre and David C. Baulcombe

Host-Mediated Phosphorylation of Type III Effector AvrPto Promotes Pseudomonas Virulence and Avirulence in Tomato
Jeffrey C. Anderson, Pete E. Pascuzzi, Fangming Xiao, Guido Sessa, and Gregory B. Martin

Online version contains Web-only data.
Open Access articles can be viewed online without a subscription.