ON THE COVER

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.

IN THIS ISSUE

A Role for APETALA2 in Maintenance of the Stem Cell Niche
Nancy A. Eckardt

CURRENT PERSPECTIVE ESSAY

Rice GIBBERELLIN INSENSITIVE DWARF1 Is a Gibberellin Receptor That Illuminates and Raises Questions about GA Signaling
Lynn M. Hartweck and Neil E. Olszewski

RESEARCH ARTICLES

Caught Red-Handed: Rc Encodes a Basic Helix-Loop-Helix Protein Conditioning Red Pericarp in Rice
Megan T. Sweeney, Michael J. Thomson, Bernard E. Pfeil, and Susan McCouch

APETALA2 Regulates the Stem Cell Niche in the Arabidopsis Shoot Meristem
Tobias Würschum, Rita Groß-Hardt, and Thomas Laux

Increased Expression of MAP KINASE KINASE7 Causes Deficiency in Polar Auxin Transport and Leads to Plant Architectural Abnormality in Arabidopsis
Ya Dai, Huanzhong Wang, Baohua Li, Juan Huang, Xinfang Liu, Yihua Zhou, Zhonglin Mou, and Jiayang Li

The Epidermis-Specific Extracellular BODYGUARD Controls Cuticle Development and Morphogenesis in Arabidopsis
Sergey Kurdyukov, Andrea Faust, Christiane Nawrath, Sascha Bär, Derry Voisin, Nadia Efremova, Rochus Franke, Lukas Schreiber, Heinz Saudler, Jean-Pierre Métraux, and Alexander Yephremov

A Rice Glutamate Receptor–Like Gene Is Critical for the Division and Survival of Individual Cells in the Root Apical Meristem
Jing Li, Shihua Zhu, Xinwei Song, Yi Shen, Hanming Chen, Jie Yu, Keke Yi, Yanfen Liu, Valerie J. Karplus, Ping Wu, and Xing Wang Deng

Arabidopsis Ribonucleotide Reductases Are Critical for Cell Cycle Progression, DNA Damage Repair, and Plant Development
Chunxin Wang and Zhongchi Liu

Members of a Novel Class of Arabidopsis Rho Guanine Nucleotide Exchange Factors Control Rho GTPase-Dependent Polar Growth
Ying Gu, Shundai Li, Elizabeth M. Lord, and Zhenbiao Yang

The A-Type Cyclin CYCA2;3 Is a Key Regulator of Ploidy Levels in Arabidopsis Endoreduplication
Kumiko K. Imai, Yohei Ohashi, Tomohiko Tsuge, Takeshi Yoshizumi, Minami Matsui, Atsushiro Oka, and Takashi Aoyama
Arabidopsis ACCELERATED CELL DEATH2 Modulates Programmed Cell Death
Nan Yao and Jean T. Greenberg

Regulation of Phosphate Homeostasis by MicroRNA in Arabidopsis
Tzyy-Jen Chou, 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, Yangdou Wei, Melanie Dauk, Yifang Tan, David C. Taylor, Gopalan Selvaraj, and Jitao Zou

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

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

The Arabidopsis Receptor Kinase FLS2 Binds fgl22 and Determines the Specificity of Flagellin Perception
Delphine Chinchilla, Zsuzsa Bauer, Martin Regenass, Thomas Boller, 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

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