ON THE COVER

The endosperm of flowering plants is a triploid nutritious seed tissue surrounding the embryo. Baroux et al. (pages 1782–1794) found an atypical chromatin organization in endosperm nuclei, which responds to imbalanced parental dosage. The main image shows a three-dimensional reconstruction of a young Arabidopsis seed stained in whole mount for DNA. The endosperm nuclei (yellow) fill the seed inside the sporophytic seed coat (green), while the zygote has just divided once (two nuclei; orange). The insets from left to right show various aspects of endosperm nuclei: (1) they appear very large compared with sporophytic nuclei and are surrounded by mitochondria, (2) their chromatin shows atypical interspersed heterochromatin foci, (3) their euchromatin is enriched in the heterochromatic H3K9me1 mark (green), and (4) their chromosome territories are expanded (red). The image was created with Imaris 5.7 (Bitplane).

IN THIS ISSUE

Oxidation Pathways and Plant Development: Crosstalk between Thioredoxin and Glutaredoxin Pathways
Nancy A. Eckardt

1719

IN BRIEF

Analysis of Small RNAs in the Basal Plant Lineages Physcomitrella and Selaginella
Nancy A. Eckardt

1722

RESEARCH ARTICLES

Genetic and Epigenetic Alteration among Three Homoeologous Genes of a Class E MADS Box Gene in Hexaploid Wheat
Naoki Shitsukawa, Chikako Tahira, Ken-ichiro Kassai, Chizuru Hirabayashi, Tomoaki Shimizu, Shigeo Takumi, Keiichi Mochida, Kanako Kawaura, Yasunari Ogihara, and Koji Murai

1723

Transcriptionally Active Heterochromatin in Rye B Chromosomes

1738

Common Functions for Diverse Small RNAs of Land Plants
Michael J. Axtell, Jo Ann Snyder, and David P. Bartel

1750

Suppression of RICE TELOMERE BINDING PROTEIN1 Results in Severe and Gradual Developmental Defects Accompanied by Genome Instability in Rice
Jong-Pil Hong, Mi Young Byun, Dal-Hoe Koo, Kyungsook An, Jae-Wook Bang, In Kwon Chung, Gynheung An, and Woo Taek Kim

1770

The Triploid Endosperm Genome of Arabidopsis Adopts a Peculiar, Parental-Dosage-Dependent Chromatin Organization
Célia Baroux, Ales Pecinka, Jörg Fuchs, Ingo Schubert, and Ueli Grossniklaus

1782

Arabidopsis JAGGED LATERAL ORGANS Is Expressed in Boundaries and Coordinates KNOX and PIN Activity
Lorenzo Borghi, Marina Bureau, and Rüdiger Simon

1795

BLADE-ON-PETIOLE1 and 2 Control Arabidopsis Lateral Organ Fate through Regulation of LOB Domain and Adaxial-Abaxial Polarity Genes
Chan Man Ha, Ji Hyung Jun, Hong Gil Nam, and Jennifer C. Fletcher

1809
Mutations in Arabidopsis Multidrug Resistance-Like ABC Transporters Separate the Roles of Acropetal and Basipetal Auxin Transport in Lateral Root Development

Guosheng Wu, Daniel R. Lewis, and Edgar P. Spalding

Separating the Roles of Acropetal and Basipetal Auxin Transport on Gravitropism with Mutations in Two Arabidopsis Multidrug Resistance-Like ABC Transporter Genes

Daniel R. Lewis, Nathan D. Miller, Bessie L. Splitt, Guosheng Wu, and Edgar P. Spalding

Inactivation of Thioredoxin Reductases Reveals a Complex Interplay between Thioredoxin and Glutathione Pathways in Arabidopsis Development

Jean-Philippe Reichheld, Mehdi Khafif, Christophe Riondet, Michel Droux, Geraldine Bonnard, and Yves Meyer

Reciprocal Phosphorylation and Glycosylation Recognition Motifs Control NCAPP1 Interaction with Pumpkin Phloem Proteins and Their Cell-to-Cell Movement

Ken-ichiro Taoka, Byung-Kook Ham, Beatriz Xoconostle-Cazares, Maria R. Rojas, and William J. Lucas

INCREASED SIZE EXCLUSION LIMIT2 Encodes a Putative DEVH Box RNA Helicase Involved in Plasmodesmata Function during Arabidopsis Embryogenesis

Ken Kobayashi, Marisa S. Otegui, Sujatha Krishnakumar, Michael Mindrinos, and Patricia Zambrisky

Ubiquitin Lysine 63 Chain–Forming Ligases Regulate Apical Dominance in Arabidopsis

Xiao-Jun Yin, Sara Volk, Karin Ljung, Norbert Mehlmer, Karel Dolezal, Franck Ditengou, Shigeru Hanano, Seth J. Davis, Elmon Schmelzer, Göran Sandberg, Markus Teige, Klaus Palme, Cecile Pickart, and Andreas Bachmair

SDR1 Is a RING Finger E3 Ligase That Positively Regulates Stress-Responsive Abscissic Acid Signaling in Arabidopsis

Yiyue Zhang, Chengwei Yang, Yin Li, Nuoyan Zheng, Hao Chen, Qingzheng Zhao, Ting Gao, Huishan Guo, and Qi Xie

ACTIN BINDING PROTEIN29 from Lilium Pollen Plays an Important Role in Dynamic Actin Remodeling

Yun Xiang, Xi Huang, Ting Wang, Yan Zhang, Qinwen Liu, Patrick J. Hussey, and Haiyun Ren

Structural Evidence for the Evolution of Xyloglucanase Activity from Xyloglucan Endo-Transglycosylases: Biological Implications for Cell Wall Metabolism

Martin J. Baumann, Jens M. Eklöf, Gürkan Michael, Åsa M. Kallas, Tuula T. Teeri, Mirjam Czjzek, and Harry Brunner III

In Vivo Visualization of Mg-ProtoporphyrinIX, a Coordinator of Photosynthetic Gene Expression in the Nucleus and the Chloroplast

Elisabeth Ankele, Peter Kindgren, Edouard Pesquet, and Åsa Strand

LPA2 Is Required for Efficient Assembly of Photosystem ii in Arabidopsis thaliana

Jinfang Ma, Lianwei Peng, Jinkui Guo, Qingtao Lu, Congming Lu, and Lixin Zhang

Rational Conversion of Substrate and Product Specificity in a Salvia Monoterpene Synthase: Structural Insights into the Evolution of Terpene Synthase Function

Sotirios C. Kampranis, Daphne Ioannidis, Alan Purvis, Walid Mahrez, Ederina Ninga, Nikolaos A. Katerelos, Samir Assnoun, Jim M. Dunwell, Jörg Degenhardt, Antonios M. Makris, Peter W. Goodenough, and Christopher B. Johnson

A Heteromeric Plastidic Pyruvate Kinase Complex Involved in Seed Oil Biosynthesis in Arabidopsis

Carl Andre, John E. Froehlich, Matthew R. Moll, and Christoph Benning

The Arabidopsis MATE Transporter TT12 Acts as a Vacuolar Flavonoid/H+–Antiporter Active in Proanthocyanidin-Accumulating Cells of the Seed Coat

Krasimira Marinova, Lucille Pourcel, Barbara Weder, Michael Schwarz, Denis Barron, Jean-Marc Routaboul, Isabelle Debeaujon, and Markus Klein
Arabidopsis Cytochrome P450 Monoxygenase 71A13 Catalyzes the Conversion of Indole-3-Acetaldoxime in Camalexin Synthesis

Majse Nafisi, Sameer Goregaoker, Christopher J. Botanga, Erich Glawischnig, Carl E. Olsen, Barbara A. Halkier, and Jane Glazebrook

Suppression of Antiviral Silencing by Cucumber Mosaic Virus 2b Protein in Arabidopsis Is Associated with Drastically Reduced Accumulation of Three Classes of Viral Small Interfering RNAs

Juan A. Diaz-Pendon, Feng Li, Wan-Xiang Li, and Shou-Wei Ding

Rice WRKY45 Plays a Crucial Role in Benzothiadiazole-Inducible Blast Resistance

Masaki Shimono, Shoji Sugano, Akira Nakayama, Chang-Jie Jiang, Kazuko Ono, Seiichi Toki, and Hiroshi Takatsuji

Bacterial Cyclic β-(1,2)-Glucan Acts in Systemic Suppression of Plant Immune Responses

Luciano Ariel Rigano, Caroline Payette, Geneviève Brouillard, Maria Rosa Marano, Laura Abramowicz, Pablo Sebastián Torres, Maximina Yun, Attilio Pedro Castagnaro, Mohamed El Oirdi, Vanessa Dufour, Florencia Malamud, John Maxwell Dow, Kamal Bouarab, and Adrian Alberto Vojnov

Online version contains Web-only data.

Open Access articles can be viewed online without a subscription.