

On the Cover: The *epigenetic control1* (*epic1*) mutant was isolated in a screen for epigenetic regulators in *Arabidopsis* (*Arabidopsis thaliana*). The GFP protein that is expressed in the young leaves is green, and the chlorophyll autofluorescence is red. The *epic1* mutant is defective in the histone deacetylase HDA6, which causes release of transcriptionally silenced GFP expression in the young leaves. This allele differs from previously reported alleles because it does not affect DNA methylation and has only a modest effect on the release of transposable elements and other heterochromatic transcripts. The outer ring represents the five *Arabidopsis* chromosomes, the green lines represent the distribution of transposable element genes, and the blue and red lines mark the up-regulated transcripts in an *hda6* null mutant and the *epic1* allele, respectively. The chromosomes and the transcriptome data were plotted using the CIRCOS software package (www.circos.ca). Cover image credits: Etienne Bucher, Institut de Recherche en Horticulture et Semences Université d'Angers, France).

FOCUS ON CHROMATIN/EPIGENETICS

EDITORIAL

Chromatin and Epigenetics. *Anna Amtmann, Hong Ma, and Doris Wagner* 1185

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Epigenetic Mechanisms Are Critical for the Regulation of *WUSCHEL* Expression in Floral Meristems.
Xiurwei Cao, Zishan He, Lin Guo, and Xigang Liu

Epigenetic mechanisms play a critical role in floral meristem maintenance and determinacy. 1189

Epigenetic Changes in Hybrids. *Ian K. Greaves, Rebeca Gonzalez-Bayon, Li Wang, Anyu Zhu, Pei-Chuan Liu, Michael Groszmann, W. James Peacock, and Elizabeth S. Dennis*

Hybrid systems show altered DNA methylation and siRNA patterns that potentially contribute to the hybrid vigor phenotype. 1197

DNA Damage Repair in the Context of Plant Chromatin. *Mattia Donà and Ortrun Mittelsten Scheid*

Efficient repair of DNA damage in plants depends on chromatin remodeling factors, histone chaperones, and histone modifiers. 1206

DNA Methylation within Transcribed Regions. *Taiko K. To, Hidetoshi Saze, and Tetsuji Kakutani*

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Trans-Homolog Interactions Facilitating Paramutation in Maize. *Brian John Giacomelli and Jay Brian Hollick*

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Flowering Locus C's Lessons: Conserved Chromatin Switches Underpinning Developmental Timing and Adaptation. *Jo Hepworth and Caroline Dean*

Vernalization has proven to pivot around chromatin changes, so that the balance of antagonistic chromatin-modifying complexes provides a fine level of control that is a target for adaptation. 1237

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[OPEN] A Genome-Wide Chronological Study of Gene Expression and Two Histone Modifications, H3K4me3 and H3K9ac, during Developmental Leaf Senescence. *Judy A. Brusslan, Giancarlo Bonora, Ana M. Rus-Canterbury, Fayha Tariq, Artur Jaroszewicz, and Matteo Pellegrini*

The presence and breadth of two histone modifications associated with active genes correlate to changes in gene expression during leaf aging, supporting senescence-related chromatin structural changes. 1246

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Natural variation of DNA methylation in maize is evident among five diverse maize inbred lines. 1262

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A histone acetyltransferase contributes to the regulation of iron homeostasis. 1309

[OPEN] Expansion and Functional Divergence of Jumonji C-Containing Histone Demethylases: Significance of Duplications in Ancestral Angiosperms and Vertebrates. *Shengzhan Qian, Yingxiang Wang, Hong Ma, and Liangsheng Zhang*

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[OPEN] The Methylome of Soybean Roots during the Compatible Interaction with the Soybean Cyst Nematode. *Aditi Rambani, J. Hollis Rice, Jinyi Liu, Thomas Lane, Priya Ranjan, Mitra Mazarei, Vince Pantalone, C. Neal Stewart Jr., Meg Staton, and Tarek Hewezi*

The soybean cyst nematode induces genomewide differential DNA methylation that impacts a large number of structural genes and biological functions. 1364

[OPEN] Photosynthetic Genes and Genes Associated with the C4 Trait in Maize Are Characterized by a Unique Class of Highly Regulated Histone Acetylation Peaks on Upstream Promoters. *Renke Perduns, Ina Horst-Niessen, and Christoph Peterhansel*

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^[OPEN]**Chlorophyll Synthase under Epigenetic Surveillance Is Critical for Vitamin E Synthesis, and Altered Expression Affects Tocopherol Levels in Arabidopsis.** Chunyu Zhang, Wei Zhang, Guodong Ren, Delin Li, Rebecca E. Cahoon, Ming Chen, Yongming Zhou, Bin Yu, and Edgar B. Cahoon

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^[OPEN]**Analysis of Loss-of-Function Mutants in Aspartate Kinase and Homoserine Dehydrogenase Genes Points to Complexity in the Regulation of Aspartate-Derived Amino Acid Contents.** Teresa J. Clark and Yan Lu

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[OPEN] How Does Leaf Anatomy Influence Water Transport outside the Xylem? *Thomas N. Buckley, Grace P. John, Christine Scoffoni, and Lauren Sack*

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[OPEN] Easy Come, Easy Go: Capillary Forces Enable Rapid Refilling of Embolized Primary Xylem Vessels. *Vivien Rolland, Dana M. Bergstrom, Thomas Lenné, Gary Bryant, Hua Chen, Joe Wolfe, N. Michele Holbrook, Daniel E. Stanton, and Marilyn C. Ball*

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[OPEN]Comprehensive Tissue-Specific Transcriptome Analysis Reveals Distinct Regulatory Programs during Early Tomato Fruit Development. Richard J. Pattison, Fabiana Csukasi, Yi Zheng, Zhangjun Fei, Esther van der Knaap, and Carmen Catalá

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[OPEN]In Vivo Identification of Photosystem II Light Harvesting Complexes Interacting with PHOTOSYSTEM II SUBUNIT S. Caterina Gerotto, Cinzia Franchin, Giorgio Arrigoni, and Tomas Morosinotto

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Ethylene promotes auxin transporter expression and auxin biosynthesis to modulate root elongation during alkaline stress.

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Lateral Organ Boundaries Domain16 and 18 Act Downstream of the AUXIN1 and LIKE-AUXIN3 Auxin Influx Carriers to Control Lateral Root Development in Arabidopsis. *Han Woo Lee, Chuloh Cho, and Jungmook Kim*

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Subtle Regulation of Potato Acid Invertase Activity by a Protein Complex of Invertase, Invertase Inhibitor, and SUCROSE NONFERMENTING1-RELATED PROTEIN KINASE. *Yuan Lin, Tengfei Liu, Jun Liu, Xun Liu, Yongbin Ou, Huiling Zhang, Meng Li, Uwe Sonnewald, Botao Song, and Conghua Xie*

Invertase activity is affected by a protein complex to modulate accumulation of reducing sugars in cold-stored potato tubers.

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^[OPEN]Strigolactone Inhibition of Branching Independent of Polar Auxin Transport. *Philip B. Brewer, Elizabeth A. Dun, Renyi Gui, Michael G. Mason, and Christine A. Beveridge*

Strigolactones act independently of auxin transport/canalization to inhibit bud outgrowth.

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SYSTEMS AND SYNTHETIC BIOLOGY

^[OPEN]Cross-Species Network Analysis Uncovers Conserved Nitrogen-Regulated Network Modules in Rice. *Mariana Obertello, Stuti Shrivastava, Manpreet S. Katari, and Gloria M. Coruzzi*

Integration of gene interaction data across a model dicot and a monocot identifies conserved and distinct regulatory network modules involved in nitrogen use, enabling translational discoveries from models to crops.

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