

On the Cover: Scan of a living seedling of *Noccaea caerulea* (a hyperaccumulator) showing Zn (green), K (red), and Ca (blue) examined using synchrotron-based X-ray fluorescence microscopy (XFM). The cover image was created by Antony van der Ent, Martin D. de Jonge, Guillaume Echevarria, Rachel Mak, Peter D. Erskine, Jolanta Mesjasz-Przybylowicz, Wojciech J. Przybylowicz, and Hugh H. Harris. The data was acquired on the X-Ray Fluorescence Microscopy (XFM) beamline of the Australian Synchrotron, ANSTO, Australia. This work was supported by the Multi-modal Australian ScienceS Imaging and Visualisation Environment (MASSIVE) and analyzed with GeoPIXE software.

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[OPEN]Plant Phenotyping: An Active Vision Cell for Three-Dimensional Plant Shoot Reconstruction. Jonathon A. Gibbs, Michael Pound, Andrew P. French, Darren M. Wells, Erik Murchie, and Tony Pridmore

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[OPEN]Identification of a Hexenal Reductase That Modulates the Composition of Green Leaf Volatiles. Toshiyuki Tanaka, Ayana Ikeda, Kaori Shiojiri, Rika Ozawa, Kazumi Shiki, Naoko Nagai-Kunihiro, Kenya Fujita, Koichi Sugimoto, Katsuyuki T. Yamato, Hideo Dohra, Toshiyuki Ohnishi, Takao Koeduka, and Kenji Matsui

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[^{OPEN}] Sulfate Metabolism in *C₄ Flaveria* Species Is Controlled by the Root and Connected to Serine Biosynthesis. Silke C. Gerlich, Berkley J. Walker, Stephan Krueger, and Stanislav Kopriva

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[^{CC-BY}] Configuration of Ten Light-Harvesting Chlorophyll *a/b* Complex I Subunits in *Chlamydomonas reinhardtii* Photosystem I. Shin-Ichiro Ozawa, Till Bald, Takahito Onishi, Huidan Xue, Takunori Matsumura, Ryota Kubo, Hiroko Takahashi, Michael Hippler, and Yuichiro Takahashi

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Multi-biparental populations generate a large set of metabolite QTL (mQTL), and consolidation of a metabolic pathway may confer plant disease resistance activity.

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[^{OPEN}] SMALL AUXIN UP RNA62/75 Are Required for the Translation of Transcripts Essential for Pollen Tube Growth. Siou-Luan He, Hsu-Liang Hsieh, and Guang-Yuh Jauh

SAUR62 and SAUR75 regulate pollen tube growth through physical interaction with ribosome subunits to affect translation of cell wall and actin cytoskeleton remodeling-related transcripts.

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[^{OPEN}] Physio-Genetic Dissection of Dark-Induced Leaf Senescence and Timing Its Reversal in Barley. Ewa Sobieszczuk-Nowicka, Tomasz Wrzesiński, Agnieszka Bagniewska-Zadworna, Szymon Kubala, Renata Rucińska-Sobkowiak, Władysław Polcyn, Lucyna Misztal, and Autar K. Mattoo

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[^{OPEN}] Specialized Plastids Trigger Tissue-Specific Signaling for Systemic Stress Response in Plants. Jesús Beltrán, Yashitola Wamboldt, Robersy Sanchez, Evan W. LaBrant, Hardik Kundariya, Kamaldeep S. Viridi, Christian Elowsky, and Sally A. Mackenzie

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Formation of transverse cortical microtubule array patterns in Arabidopsis hypocotyl cells requires the active suppression of longitudinal polymers.

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[OPEN] Components of Water Use Efficiency Have Unique Genetic Signatures in the Model C₄ Grass *Setaria*. *Max J. Feldman, Patrick Z. Ellsworth, Noah Fahlgren, Malia A. Gehan, Asaph B. Cousins, and Ivan Baxter*

Both water-dependent and water-independent processes controlled by unique genetic components regulate plant growth in the model C₄ grass Setaria.

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[OPEN] Retrotransposon Insertion and DNA Methylation Regulate Aluminum Tolerance in European Barley Accessions. *Miho Kashino-Fujii, Kengo Yokosho, Naoki Yamaji, Miki Yamane, Daisuke Saisho, Kazuhiro Sato, and Jian Feng Ma*

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A bZIP transcription factor enables maize to grow better under stress by promoting root growth and the expression of stress-related genes.

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[OPEN] An Ancestral Allele of *Pyrroline-5-carboxylate synthase1* Promotes Proline Accumulation and Drought Adaptation in Cultivated Barley. *Shumaila Muzammil, Asis Shrestha, Said Dadshani, Klaus Pillen, Shahid Siddique, Jens Léon, and Ali Ahmad Naz*

*Allelic variation of *Pyrroline-5-carboxylate synthase1* underlies sequence divergence across the promoter in the cultivated and wild barley which modulates its drought-inducible transcriptional activity.*

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[OPEN] Mobility of Antiflorigen and PEBP mRNAs in Tomato-Tobacco Heterografts. *Nien-Chen Huang, Kai-Ren Luo, and Tien-Shin Yu*

Long-distance movement of tobacco NcCET1 and PEBP mRNAs suggests that acquisition of RNA mobility is an early evolutionary event.

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The Coumarin Glucoside, Esculin, Reveals Rapid Changes in Phloem-Transport Velocity in Response to Environmental Cues. *Kirsten Knox, Andrea Paterlini, Simon Thomson, and Karl Oparka*

Esculin, used as a sucrose mimic, shows that the velocity of phloem transport is regulated by environmental cues, changes in sucrose levels, and the expression of the sucrose transporter AtSUC2.

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^[OPEN]EIN3-LIKE1, MYB1, and ETHYLENE RESPONSE FACTOR3 Act in a Regulatory Loop That Synergistically Modulates Ethylene Biosynthesis and Anthocyanin Accumulation. *Jian-Ping An, Xiao-Fei Wang, Yuan-Yuan Li, Lai-Qing Song, Ling-Ling Zhao, Chun-Xiang You, and Yu-Jin Hao*

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^[OPEN]Three Auxin Response Factors Promote Hypocotyl Elongation. *Jason W. Reed, Miin-Feng Wu, Paul H. Reeves, Charles Hodgens, Vandana Yadav, Scott Hayes, and Ronald Pierik*

Three Auxin Response Factors control hypocotyl elongation in Arabidopsis under environmental conditions that require rapid growth. 864

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GmMEKK1 regulates cell death and defense responses independent of activation of GmMPK4 and possibly by differentially regulating GmMPK3 and GmMPK6 via distinct downstream GmMKs in soybean. 907

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Hydrogen Sulfide Disturbs Actin Polymerization via S-Sulphydration Resulting in Stunted Root Hair Growth. Jisheng Li, Sisi Chen, Xiaofeng Wang, Cong Shi, Huaxin Liu, Jun Yang, Wei Shi, Junkang Guo and Honglei Jia

Hydrogen sulfide-induced S-sulphydration affects actin dynamics and root hair growth in Arabidopsis.

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