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Orange Carotenoid Protein Quenches Excess Energy and Singlet Oxygen
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Efficient Genome-Wide Detection and Cataloging of EMS-Induced Mutations Using Exome Capture and Next-Generation Sequencing

High-Throughput Genotyping of Green Algal Mutants Reveals Random Distribution of Mutagenic Insertion Sites and Endonucleolytic Cleavage of Transforming DNA
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Nitrogen-Sparing Mechanisms in *Chlamydomonas* Affect the Transcriptome, the Proteome, and Photosynthetic Metabolism
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RESEARCH ARTICLES

Boom-Bust Turnovers of Megabase-Sized Centromeric DNA in *Solanum* Species: Rapid Evolution of DNA Sequences Associated with Centromeres
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ON THE COVER

Cells must sense and regulate their internal $\text{NH}_4^+$ levels to modulate nitrogen levels and avoid $\text{NH}_4^+$ toxicity. Bai et al. (pages 1497–1511) identify an *Arabidopsis* $\text{Ca}^{2+}\text{ATP}$-associated protein kinase (CAP1), a receptor-like kinase that mediates $\text{NH}_4^+$ homeostasis. CAP1 also regulates the polar growth of root hairs by maintaining tip-focused cytoplasmic $\text{Ca}^{2+}$ gradients. The cap1-1 mutation specifically affects root hair tip elongation and the morphology of root hairs on Murashige and Skoog medium and produces elevated levels of cytoplasmic $\text{NH}_4^+$. Ammonium depletion from the medium reestablished the $\text{Ca}^{2+}$ gradient necessary for normal root hair tip growth in the mutant. The image shows abnormal root hairs in a cap1-1 mutant grown on Murashige and Skoog medium.
Homoeologous Chromosome Sorting and Progression of Meiotic Recombination in *Brassica napus*: Ploidy Does Matter!

Laurie Grandont, Nieves Cuñado, Olivier Coriton, Virgine Huteau, Frédérique Eber, Anne Marie Chèvre, Mathilde Grelon, Liudmila Chelysheva, and Eric Jenczewski

STM/BP-Like KNOXI Is Uncoupled from ARP in the Regulation of Compound Leaf Development in *Medicago truncatula*

Chuanen Zhou, Lu Han, Guifen Li, Maofeng Chai, Chunxiang Fu, Xiaofei Cheng, Jiangqi Wen, Yuhong Tang, and Zeng-Yu Wang

Analysis of the Root System Architecture of *Arabidopsis* Provides a Quantitative Readout of Crosstalk between Nutritional Signals

Fabian Kellermeyer, Patrick Armengaud, Triona J. Seditas, John Danku, David E. Salt, and Anna Amtmann

A Receptor-Like Kinase Mediates Ammonium Homeostasis and Is Important for the Polar Growth of Root Hairs in *Arabidopsis*

Ling Bai, Xiaonan Ma, Guozeng Zhang, Shufei Song, Yun Zhou, Lijie Gao, Yuchen Miao, and Chun-Peng Song

The Rice Basic Helix-Loop-Helix Transcription Factor TDR INTERACTING PROTEIN2 Is a Central Switch in Early Anther Development

Zhenzhen Fu, Jing Yu, Xiaowei Cheng, Xu Zong, Jie Xu, Mingjiao Chen, Zongyun Li, Dabing Zhang, and Wanqi Liang

The ARC1 E3 Ligase Promotes Two Different Self-Pollen Avoidance Traits in *Arabidopsis*

Emily Indriolo, Darya Safavian, and Daphne R. Goring

*ABORTED MICROSPORES* Acts as a Master Regulator of Pollen Wall Formation in *Arabidopsis*

Jie Xu, Zhiwen Ding, Gema Vízquez-Barrera, Jianxin Shi, Wangqi Liang, Zheng Yuan, Danièle Werck-Reichhart, Lukas Schreiber, Zoe A. Wilson, and Dabing Zhang

*EARLY FLOWERING3* Regulates Flowering in Spring Barley by Mediating Gibberellin Production and *FLOWERING LOCUS T* Expression

Scott A. Boden, David Weiss, John J. Ross, Noel W. Davies, Ben Trevaskis, Peter M. Chandler, and Steve M. Swain

Functional Analysis of the Hydrophilic Loop in Intracellular Trafficking of *Arabidopsis* PIN-FORMED Proteins

Anindya Ganguly, Minho Park, Mahipal Singh Kesawat, and Hyung-Taeg Cho

SPX4 Negatively Regulates Phosphate Signaling and Homeostasis through its Interaction with PHR2 in *Rice*

Qundan Lv, Yongjia Zhong, Yuguang Wang, Zhiye Wang, Li Zhang, Jing Shi, Zhongchang Wu, Yu Liu, Chuanzao Mao, Keke Yi, and Ping Wu

Light-Harvesting Complex Protein LHCBM9 Is Critical for Photosystem II Activity and Hydrogen Production in *Chlamydomonas reinhardtii*

Sabrina Grewe, Matteo Ballottari, Marcelo Alcocer, Cosimo D’Andrea, Olga Blifernez-Klassen, Ben Hankamer, Jan H. Mussgnug, Roberto Bassi, and Olaf Kruse

*ACTIN-RELATED PROTEIN6* Regulates Female Meiosis by Modulating Meiotic Gene Expression in *Arabidopsis*

Yuan Qin, Lihua Zhao, Megan I. Skaggs, Sebastien Andreuza, Tatsuya Tsukamoto, Aneesh Panoli, Kirsten N. Wallace, Steven Smith, Imran Siddiqi, Zhenbiao Yang, Ramin Yadegari, and Ravishankar Palanivelu

Actin-Dependent and -Independent Functions of Cortical Microtubules in the Differentiation of *Arabidopsis* Leaf Trichomes

Adrian Sambade, Kim Findlay, Anton R. Schäflner, Clive W. Lloyd, and Henrik Buschmann
Choreography of Transcriptomes and Lipidomes of *Nannochloropsis* Reveals the Mechanisms of Oil Synthesis in Microalgae

Jing Li, Danxiang Han, Dongmei Wang, Kang Ning, Jing Jia, Li Wei, Xiaoyan Jing, Shi Huang, Jie Chen, Yantao Li, Qiang Hu, and Jian Xu

Arabidopsis Cuticular Wax Biosynthesis Is Negatively Regulated by the DEWAX Gene Encoding an AP2/ERF-Type Transcription Factor

Young Sam Go, Hyojin Kim, Hae Jin Kim, and Mi Chung Suh

Methylcrotonyl-CoA Carboxylase Regulates Triacylglycerol Accumulation in the Model Diatom *Phaeodactylum tricornutum*

Feng Ge, Weichao Huang, Zhuo Chen, Chunye Zhang, Qian Xiong, Chris Bowler, Juan Yang, Jin Xu, and Hanhua Hu

Plasma Membranes Are Subcompartmentalized into a Plethora of Coexisting and Diverse Microdomains in *Arabidopsis* and *Nicotiana benthamiana*


Arabidopsis Class I α-Mannosidases MNS4 and MNS5 Are Involved in Endoplasmic Reticulum–Associated Degradation of Misfolded Glycoproteins

Silvia Hüttner, Christiane Veit, Ulrike Vavra, Jennifer Schoberer, Eva Liebminger, Daniel Maresch, Josephine Grass, Friedrich Altmann, Lukas Mach, and Richard Strasser

Clathrin and Membrane Microdomains Cooperatively Regulate RbohD Dynamics and Activity in *Arabidopsis*

Huaiqing Hao, Lusheng Fan, Tong Chen, Ruili Li, Xiaojuan Li, Qhua He, Miguel A. Botella, and Jinxing Lin

The Enzyme-Like Domain of *Arabidopsis* Nuclear β-Amylases Is Critical for DNA Sequence Recognition and Transcriptional Activation

Sebastian Soyk, Klařa Sšímková, Evelyne Zürcher, Leonie Luginbühl, Luise H. Brand, Cara K. Vaughan, Dierk Wanke, and Samuel C. Zeeman

HEAT-INDUCED TAS1 TARGET1 Mediates Thermotolerance via HEAT STRESS TRANSCRIPTION FACTOR A1a–Directed Pathways in *Arabidopsis*

Shuxia Li, Jinxin Liu, Zhongyuan Liu, Xiaorong Li, Feijie Wu, and Yuke He

The Cyanobacterial Photoactive Orange Carotenoid Protein Is an Excellent Singlet Oxygen Quencher

Arezki Sedoud, Rocio López-Igual, Ateeq ur Rehman, Adjéle Wilson, François Perreau, Clémence Boulay, Imre Vass, Anja Krieger-Liszkay, and Diana Kirilovsky

*Arabidopsis* miR156 Regulates Tolerance to Recurring Environmental Stress through SPL Transcription Factors

Anna Stief, Simone Altmann, Karen Hoffmann, Bikram Datt Pant, Wolf-Rüdiger Scheible, and Isabel Baurle

The H+-ATPase HA1 of *Medicago truncatula* Is Essential for Phosphate Transport and Plant Growth during Arbuscular Mycorrhizal Symbiosis

Franziska Krajinski, Pierre-Emmanuel Courty, Daniela Sieh, Philipp Franken, Haoqiang Zhang, Marcel Bucher, Nina Gerlach, Igor Kryvoruchko, Daniela Zoeller, Michael Udvardi, and Bettina Hause
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Ertao Wang, Nan Yu, S. Asma Bano, Chengwu Liu, Anthony J. Miller, Donna Cousins, Xiaowei Zhang, Pascal Ratet, Million Tadege, Kirankumar S. Mysore, J. Allan Downie, Jeremy D. Murray, Giles E.D. Oldroyd, and Michael Schultze

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