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On the Cover: The use of in vivo fluorescence-based microscopy has allowed direct visualization of intracellular infection by nitrogen-fixing *Sinorhizobium meliloti* in living root hair cells of the legume *Medicago truncatula* (see Fournier et al., pp. 1985–1995). This highly regulated process involves the progressive formation of an apoplastic intracellular compartment known as the infection thread (IT). The panels on the cover illustrate three stages of IT growth within a single root hair viewed over a 20-h period. The GFP-HDEL marker labels the endoplasmic reticulum within the host cytoplasm (in green), and the CFP fluorescence labels the colonizing rhizobia (in magenta) within the IT. During early stages of IT growth (top), there are relatively few rhizobia in the thread and the frequent gaps within the bacterial file result from differential movement of rhizobia. A broad column of cytoplasm links the root hair nucleus to the rapidly elongating thread. Subsequently, the IT continues its growth towards the base of the hair (middle and bottom), and the thread is progressively colonized by rhizobia. Time-lapse imaging of growing ITs has revealed that the extension of the IT precedes rhizobial colonization of the thread and also that rhizobial progress within the thread involves a combination of cell division and collective “sliding” movement. Finally, the dynamics of the root hair cytoarchitecture suggests that the underlying cellular mechanism of IT development closely resembles that recently described for arbuscular mycorrhizal infection. Confocal images by J. Fournier.

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LETTER TO THE EDITOR

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Response to Lifschitz Letter. Claire Périlleux

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GENOME ANALYSIS

^{[W][OA]}Differential Accumulation of Retroelements and Diversification of NB-LRR Disease Resistance Genes in Duplicated Regions following Polyploidy in the Ancestor of Soybean. Roger W. Innes, Carine Ameline-Torregrosa, Tom Ashfield, Ethalinda Cannon, Steven B. Cannon, Ben Chacko, Nicolas W.G. Chen, Arnaud Couloux, Anita Dalwani, Roxanne Denny, Shweta Deshpande, Ashley N. Egan, Natasha Glover, Christian S. Hans, Stacy Howell, Dan Ilut, Scott Jackson, Hongshing Lai, Jafar Mammadov, Sara Martin del Campo, Michelle Metcalf, Ashley Nguyen, Majesta O’Bleness, Bernard E. Pfeil, Ram Podicheti, Milind B. Ratnaparkhe, Sylvie Samain, Iryna Sanders, Béatrice Ségurens, Mireille Sévignac, Sue Sherman-Broyles, Vincent Thareau, Dominic M. Tucker, Jason Walling, Adam Wawrzynski, Jing Yi, Jeff J. Doyle, Valérie Geffroy, Bruce A. Roe, M.A. Saghai Maroof, and Nevin D. Young

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^{[W][OA]}Replication of Nonautonomous Retroelements in Soybean Appears to Be Both Recent and Common. Adam Wawrzynski, Tom Ashfield, Nicolas W.G. Chen, Jafar Mammadov, Ashley Nguyen, Ram Podicheti, Steven B. Cannon, Vincent Thareau, Carine Ameline-Torregrosa, Ethalinda Cannon, Ben Chacko, Arnaud Couloux, Anita Dalwani, Roxanne Denny, Shweta Deshpande, Ashley N. Egan, Natasha Glover, Stacy Howell, Dan Ilut, Hongshing Lai, Sara Martin del Campo, Michelle Metcalf, Majesta O’Bleness, Bernard E. Pfeil, Milind B. Ratnaparkhe, Sylvie Samain, Iryna Sanders, Béatrice Ségurens, Mireille Sévignac, Sue Sherman-Broyles, Dominic M. Tucker, Jing Yi, Jeff J. Doyle, Valérie Geffroy, Bruce A. Roe, M.A. Saghai Maroof, Nevin D. Young, and Roger W. Innes

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BIOINFORMATICS

- ^[W]Finding and Comparing Syntenic Regions among Arabidopsis and the Outgroups Papaya, Poplar, and Grape: CoGe with Rosids. *Eric Lyons, Brent Pedersen, Josh Kane, Maqsoodul Alam, Ray Ming, Haibao Tang, Xiyin Wang, John Bowers, Andrew Paterson, Damon Lisch, and Michael Freeling* 1772

RESEARCH ARTICLES

BIOCHEMICAL PROCESSES AND MACROMOLECULAR STRUCTURES

- ^{[W][OA]}Inhibition of 2-Oxoglutarate Dehydrogenase in Potato Tuber Suggests the Enzyme Is Limiting for Respiration and Confirms Its Importance in Nitrogen Assimilation. *Wagner L. Araújo, Adriano Nunes-Nesi, Sandra Trenkamp, Victoria I. Bunik, and Alisdair R. Fernie* 1782
- ^[OA]Identification and Characterization of ADNT1, a Novel Mitochondrial Adenine Nucleotide Transporter from Arabidopsis. *Luigi Palmieri, Antonella Santoro, Fernando Carrari, Emanuela Blanco, Adriano Nunes-Nesi, Roberto Arrigoni, Francesco Genchi, Alisdair R. Fernie, and Ferdinando Palmieri* 1797
- ^{[W][OA]}Novel Proteins, Putative Membrane Transporters, and an Integrated Metabolic Network Are Revealed by Quantitative Proteomic Analysis of Arabidopsis Cell Culture Peroxisomes. *Holger Eubel, Etienne H. Meyer, Nicolas L. Taylor, John D. Bussell, Nicholas O'Toole, Joshua L. Heazlewood, Ian Castleden, Ian D. Small, Steven M. Smith, and A. Harvey Millar* 1809
- ^{[W][OA]}Transcriptomic and Reverse Genetic Analyses of Branched-Chain Fatty Acid and Acyl Sugar Production in *Solanum pennellii* and *Nicotiana benthamiana*. *Stephen P. Slocombe, Ines Schauvinhold, Ryan P. McQuinn, Katrin Besser, Nicholas A. Welsby, Andrea Harper, Naveed Aziz, Yi Li, Tony R. Larson, James Giovannoni, Richard A. Dixon, and Pierre Broun* 1830
- ^[OA]The DEG15 Serine Protease Cleaves Peroxisomal Targeting Signal 2-Containing Proteins in Arabidopsis. *Holger Schuhmann, Pitter F. Huesgen, Christine Gietl, and Iwona Adamska* 1847
- ^[OA]The Chloroplast DnaJ Homolog CDJ1 of *Chlamydomonas reinhardtii* Is Part of a Multichaperone Complex Containing HSP70B, CGE1, and HSP90C. *Felix Willmund, Karolin V. Dorn, Miriam Schulz-Raffelt, and Michael Schroda* 2070
- ^[W]A Genome-Wide and Metabolic Analysis Determined the Adaptive Response of Arabidopsis Cells to Folate Depletion Induced by Methotrexate. *Karen Loizeau, Veerle De Brouwer, Bernadette Gambonnet, Agnès Yu, Jean-Pierre Renou, Dominique Van Der Straeten, Willy E. Lambert, Fabrice Rébeillé, and Stéphane Ravanel* 2083
- ^{[C][W][OA]}A Novel 2-Oxoacid-Dependent Dioxygenase Involved in the Formation of the Goiterogenic 2-Hydroxybut-3-enyl Glucosinolate and Generalist Insect Resistance in Arabidopsis. *Bjarne G. Hansen, Rachel E. Kerwin, James A. Ober, Virginia M. Lambrix, Thomas Mitchell-Olds, Jonathan Gershenzon, Barbara A. Halkier, and Daniel J. Kliebenstein* 2096

BIOENERGETICS AND PHOTOSYNTHESIS

- ^[W]Metabolome Phenotyping of Inorganic Carbon Limitation in Cells of the Wild Type and Photorespiratory Mutants of the Cyanobacterium *Synechocystis* sp. Strain PCC 6803. *Marion Eisenhut, Jan Huege, Doreen Schwarz, Hermann Bauwe, Joachim Kopka, and Martin Hagemann* 2109

CELL BIOLOGY AND SIGNAL TRANSDUCTION

- ^[OA]Characterization of Cytokinin and Adenine Transport in Arabidopsis Cell Cultures. *Anna Cedzich, Harald Stransky, Burkhard Schulz, and Wolf B. Frommer* 1857
- ^{[W][OA]}Interaction of the WD40 Domain of a Myoinositol Polyphosphate 5-Phosphatase with SnRK1 Links Inositol, Sugar, and Stress Signaling. *Elitsa A. Ananieva, Glenda E. Gillaspay, Amanda Ely, Ryan N. Burnette, and F. Les Erickson* 1868
- ^{[C][W][OA]}The Arabidopsis Calcium Sensor Calcineurin B-Like 3 Inhibits the 5'-Methylthioadenosine Nucleosidase in a Calcium-Dependent Manner. *Seung-Ick Oh, Jimyeong Park, Sunhee Yoon, Yungyeong Kim, Soojin Park, Migyeong Ryu, Min Jung Nam, Sung Han Ok, Jeong-Kook Kim, Jeong-Sheop Shin, and Kyung-Nam Kim* 1883

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- [W][OA] Arabidopsis Casein Kinase 1-Like 6 Contains a Microtubule-Binding Domain and Affects the Organization of Cortical Microtubules. *Gili Ben-Nissan, Weier Cui, Dong-Jin Kim, Yaodong Yang, Byung-Chun Yoo, and Jung-Youn Lee* 1897

DEVELOPMENT AND HORMONE ACTION

- [W][OA] Unique and Overlapping Expression Patterns among Members of Photosynthesis-Associated Nuclear Gene Families in Arabidopsis. *Megan G. Sawchuk, Tyler J. Donner, Philip Head, and Enrico Scarpella* 1908
- [C][W] F-Box Protein DOR Functions As a Novel Inhibitory Factor for Abscisic Acid-Induced Stomatal Closure under Drought Stress in Arabidopsis. *Yu'e Zhang, Wenyong Xu, Zhonghui Li, Xing Wang Deng, Weihua Wu, and Yongbiao Xue* 2121

ENVIRONMENTAL STRESS AND ADAPTATION TO STRESS

- [W] Mimicking the Plant Cell Interior under Water Stress by Macromolecular Crowding: Disordered Dehydrin Proteins Are Highly Resistant to Structural Collapse. *Jean-Marie Mouillon, Sylvia K. Eriksson, and Pia Harryson* 1925
- [W][OA] Characterization of OsbZIP23 as a Key Player of the Basic Leucine Zipper Transcription Factor Family for Conferring Abscisic Acid Sensitivity and Salinity and Drought Tolerance in Rice. *Yong Xiang, Ning Tang, Hao Du, Haiyan Ye, and Lizhong Xiong* 1938
- [C][W][OA] Transcriptional Modulation of Ethylene Response Factor Protein JERF3 in the Oxidative Stress Response Enhances Tolerance of Tobacco Seedlings to Salt, Drought, and Freezing. *Lijun Wu, Zhijin Zhang, Haiwen Zhang, Xue-Chen Wang, and Rongfeng Huang* 1953
- [W] Cell Membrane Surface Potential (ψ_s) Plays a Dominant Role in the Phytotoxicity of Copper and Arsenate. *Peng Wang, Dongmei Zhou, Thomas B. Kinraide, Xiaosan Luo, Lianzhen Li, Dandan Li, and Hailin Zhang* 2134

GENETICS, GENOMICS, AND MOLECULAR EVOLUTION

- [C][W][OA] Transcriptome Analysis of Proliferating Arabidopsis Endosperm Reveals Biological Implications for the Control of Syncytial Division, Cytokinin Signaling, and Gene Expression Regulation. *Robert C. Day, Rowan P. Herdridge, Barbara A. Ambrose, and Richard C. Macknight* 1964

PLANTS INTERACTING WITH OTHER ORGANISMS

- [W][OA] Mechanism of Infection Thread Elongation in Root Hairs of *Medicago truncatula* and Dynamic Interplay with Associated Rhizobial Colonization. *Joëlle Fournier, Antonius C.J. Timmers, Björn J. Sieberer, Alain Jauneau, Mireille Chabaud, and David G. Barker* 1985
- [C][OA] *Pseudomonas fluorescens* WCS374r-Induced Systemic Resistance in Rice against *Magnaporthe oryzae* Is Based on Pseudobactin-Mediated Priming for a Salicylic Acid-Repressible Multifaceted Defense Response. *David De Vleeschauwer, Mohammad Djavaheri, Peter A.H.M. Bakker, and Monica Höfte* 1996

WHOLE PLANT AND ECOPHYSIOLOGY

- [W][OA] Carbon Isotope Fractionation during Photorespiration and Carboxylation in *Senecio*. *Gary J. Lanigan, Nicholas Betson, Howard Griffiths, and Ulli Seibt* 2013
- [W][OA] Bundle Sheath Leakiness and Light Limitation during C₄ Leaf and Canopy CO₂ Uptake. *Johannes Kromdijk, Hans E. Schepers, Fabrizio Albanito, Nuala Fitton, Faye Carroll, Michael B. Jones, John Finnan, Gary J. Lanigan, and Howard Griffiths* 2144

SYSTEMS BIOLOGY, MOLECULAR BIOLOGY, AND GENE REGULATION

- ^[W]The Transcript and Metabolite Networks Affected by the Two Clades of Arabidopsis Glucosinolate Biosynthesis Regulators. *Sergey Malitsky, Eyal Blum, Hadar Less, Ilya Venger, Moshe Elbaz, Shai Morin, Yuval Eshed, and Asaph Aharoni* 2021
- ^{[W][OA]}Arabidopsis Transcriptome Reveals Control Circuits Regulating Redox Homeostasis and the Role of an AP2 Transcription Factor. *Abha Khandelwal, Thanura Elvitigala, Bijoy Ghosh, and Ralph S. Quatrano* 2050
- ^{[C][W][OA]}Arabidopsis CLP1-SIMILAR PROTEIN3, an Ortholog of Human Polyadenylation Factor CLP1, Functions in Gametophyte, Embryo, and Postembryonic Development. *Denghui Xing, Hongwei Zhao, and Qingshun Quinn Li* 2059

^[C] Some figures in this article are displayed in color online but in black and white in the print edition.

^[W] Indicates Web-only data.

^[OA] Open Access articles can be viewed online without a subscription.