The electronic form of this issue, available as of December 11, 2008, at www.plantphysiol.org, is considered the journal of record.

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.

ON THE INSIDE

Peter V. Minorsky

LETTER TO THE EDITOR

Multiple Regulatory Roles for SELF-PRUNING in the Shoot System of Tomato. Eliezer Lifschitz

Response to Lifschitz Letter. Claire Pérrilleux

GENOME ANALYSIS


Continued on next page
BIOINFORMATICS


RESEARCH ARTICLES

BIOCHEMICAL PROCESSES AND MACROMOLECULAR STRUCTURES

Inhibition of 2-Oxoglutarate Dehydrogenase in Potato Tuber Suggests the Enzyme Is Limiting for Respiration and Confirms Its Importance in Nitrogen Assimilation. Wagner L. Araujo, Adriano Nunes-Nesi, Sandra Trenkamp, Victoria I. Bunik, and Alisdair R. Fernie

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


The DEG15 Serine Protease Cleaves Peroxisomal Targeting Signal 2-Containing Proteins in Arabidopsis. Holger Schuhmann, Pitter F. Huesgen, Christine Giel, and Iwona Adamska

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

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 Rébéillé, and Stéphane Ravanel


BIOENERGETICS AND PHOTOSYNTHESIS

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, Ian Hauge, Doreen Schwarz, Hermann Bauwe, Joachim Kopka, and Martin Hagemann

CELL BIOLOGY AND SIGNAL TRANSDUCTION

Characterization of Cytokinin and Adenine Transport in Arabidopsis Cell Cultures. Anna Cedzich, Harald Stransky, Burkhard Schulz, and Wolf B. Frommer

Interaction of the WD40 Domain of a Myoinositol Polyphosphate 5-Phosphatase with SnRK1 Links Inositol, Sugar, and Stress Signaling. Elitsa A. Ananieva, Glenda E. Gillaspy, Amanda Ely, Ryan N. Burnette, and F. Les Erickson

The Arabidopsis Calcium Sensor Calcineurin B-Like 3 Inhibits the 5'-Methylthioadenosine Nucleosidase in a Calcium-Dependent Manner. Seung-Ick Oh, Jimyong Park, Sunhee Yoon, Younggeon Kim, Soojin Park, Migyeong Ryu, Min Jung Nam, Sung Han Ok, Jeong-Kook Kim, Jeong-Sheop Shin, and Kyung-Nam Kim
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

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

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

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

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

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

Cell Membrane Surface Potential (φ0) 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 Haifin Zhang

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. Herridge, Barbara A. Ambrose, and Richard C. Macknight

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 Jaunetou, Mireille Chabaud, and David G. Barker

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 Vleesschauwer, Mohammad Djavaheri, Peter A.H.M. Bakker, and Monica Höfte

Carbon Isotope Fractionation during Photorespiration and Carboxylation in Senecio. Gary J. Lanigan, Nicholas Betson, Howard Griffiths, and Ulli Seibt

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

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

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

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

Indicates Web-only data.

Open Access articles can be viewed online without a subscription.