

The electronic form of this issue, available as of August 13, 2007, at [www.plantphysiol.org](http://www.plantphysiol.org), is considered the journal of record.

**On the Cover:** *Physcomitrella patens* is tolerant of high levels of NaCl and can maintain growth at Na<sup>+</sup> concentrations detrimental to most vascular plants. This tolerance is suggested to be due to the expression of one or two ENA-type Na<sup>+</sup>-ATPases, which are absent in vascular plants. In this issue, Lunde et al. (pp. 1786–1796) show that PpENA1 is important under moderate salt stress. When grown in 100 mM NaCl, wild-type *Physcomitrella* is able to maintain a higher K<sup>+</sup> to Na<sup>+</sup> ratio and growth rate compared to the PpENA1 (*ena1*) gene knockout.

The tissue-specific expression of PpENA1 in *Physcomitrella* was determined by fusing the PpENA1 promoter to a GUS-reporter gene. In the nonstressed gametophyte (left), GUS staining was confined to the stem, the basal part of the leaves, and to a small number of rhizoids originating from the base of the gametophyte. No staining was present in the apical part of the leaf, and staining was less pronounced in the top leaves compared to the leaves closer to the base of the gametophyte. The staining was significantly stronger but still confined to the same tissues in gametophytes exposed to 100 mM NaCl (right). Cover image by Christina Lunde.

## ON THE INSIDE

Peter V. Minorsky

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## LETTER TO THE EDITOR

Structural Organization and a Standardized Nomenclature for Plant Endo-1,4- $\beta$ -Glucanases (Cellulases) of Glycosyl Hydrolase Family 9. Breeanna R. Urbanowicz, Alan B. Bennett, Elena del Campillo, Carmen Catalá, Takahisa Hayashi, Bernard Henrissat, Herman Höfte, Simon J. McQueen-Mason, Sara E. Patterson, Oded Shoseyov, Tuula T. Teeri, and Jocelyn K.C. Rose

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## GENOME ANALYSIS

<sup>[W][OA]</sup>Genome-Wide Analysis of the Core DNA Replication Machinery in the Higher Plants Arabidopsis and Rice. Randall W. Shultz, Vinaya M. Tatineni, Linda Hanley-Bowdoin, and William F. Thompson

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## RESEARCH ARTICLES

### BIOCHEMICAL PROCESSES AND MACROMOLECULAR STRUCTURES

<sup>[W][OA]</sup>Localization of Members of the  $\gamma$ -Glutamyl Transpeptidase Family Identifies Sites of Glutathione and Glutathione S-Conjugate Hydrolysis. Melinda N. Martin, Pilar H. Saladores, Elton Lambert, Andre O. Hudson, and Thomas Leustek

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<sup>[C][OA]</sup>How a Plant Lectin Recognizes High Mannose Oligosaccharides. Abel Garcia-Pino, Lieven Buts, Lode Wyns, Anne Imberty, and Remy Loris

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### BIOENERGETICS AND PHOTOSYNTHESIS

<sup>[W][OA]</sup>A Novel Nucleus-Encoded Chloroplast Protein, PIFI, Is Involved in NAD(P)H Dehydrogenase Complex-Mediated Chlororespiratory Electron Transport in Arabidopsis. Dafu Wang and Archie R. Portis, Jr.

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<sup>[C]</sup>Role of the Low-Molecular-Weight Subunits PetL, PetG, and PetN in Assembly, Stability, and Dimerization of the Cytochrome *b<sub>6</sub>f* Complex in Tobacco. *Serena Schwenkert, Julia Legen, Tsuneaki Takami, Toshiharu Shikanai, Reinhold G. Herrmann, and Jörg Meurer* 1924

<sup>[OA]</sup>Phosphorylation of Phosphoenolpyruvate Carboxylase Is Not Essential for High Photosynthetic Rates in the *C<sub>4</sub>* Species *Flaveria bidentis*. *Tsuyoshi Furumoto, Katsura Izui, Vanda Quinn, Robert T. Furbank, and Susanne von Caemmerer* 1936

<sup>[W]</sup>Long-Term Response toward Inorganic Carbon Limitation in Wild Type and Glycolate Turnover Mutants of the Cyanobacterium *Synechocystis* sp. Strain PCC 6803. *Marion Eisenhut, Eneás Aguirre von Wobeser, Ludwig Jonas, Hendrik Schubert, Bas W. Ibelings, Hermann Bauwe, Hans C.P. Matthijs, and Martin Hagemann* 1946

## CELL BIOLOGY AND SIGNAL TRANSDUCTION

Silencing of the Major Salt-Dependent Isoform of Pectinesterase in Tomato Alters Fruit Softening. *Thanh D. Phan, Wen Bo, Gill West, Grantley W. Lycett, and Gregory A. Tucker* 1960

## DEVELOPMENT AND HORMONE ACTION

<sup>[W][OA]</sup>Synergid Cell Death in Arabidopsis Is Triggered following Direct Interaction with the Pollen Tube. *Linda Sandaklie-Nikolova, Ravishankar Palanivelu, Edward J. King, Gregory P. Copenhaver, and Gary N. Drews* 1753

<sup>[C][OA]</sup>Expression of a Constitutively Activated Plasma Membrane H<sup>+</sup>-ATPase Alters Plant Development and Increases Salt Tolerance. *Frédéric Gévaudant, Geoffrey Duby, Erik von Stedingk, Rongmin Zhao, Pierre Morsomme, and Marc Boutry* 1763

## ENVIRONMENTAL STRESS AND ADAPTATION TO STRESS

<sup>[W][OA]</sup>Double Mutants Deficient in Cytosolic and Thylakoid Ascorbate Peroxidase Reveal a Complex Mode of Interaction between Reactive Oxygen Species, Plant Development, and Response to Abiotic Stresses. *Gad Miller, Nobuhiro Suzuki, Ludmila Rizhsky, Alicia Hegie, Shai Koussevitzky, and Ron Mittler* 1777

Exclusion of Na<sup>+</sup> via Sodium ATPase (PpENA1) Ensures Normal Growth of *Physcomitrella patens* under Moderate Salt Stress. *Christina Lunde, Damian P. Drew, Andrew K. Jacobs, and Mark Tester* 1786

<sup>[C][OA]</sup>A Higher Plant  $\Delta 8$  Sphingolipid Desaturase with a Preference for (Z)-Isomer Formation Confers Aluminum Tolerance to Yeast and Plants. *Peter R. Ryan, Qing Liu, Petra Sperling, Bei Dong, Stefan Franke, and Emmanuel Delhaize* 1968

<sup>[OA]</sup>Rice Shaker Potassium Channel OsKAT1 Confers Tolerance to Salinity Stress on Yeast and Rice Cells. *Toshihiro Obata, Hiroko K. Kitamoto, Atsuko Nakamura, Atsunori Fukuda, and Yoshiyuki Tanaka* 1978

## GENETICS, GENOMICS, AND MOLECULAR EVOLUTION

<sup>[W]</sup>Genome-Wide Gene Expression Profiling Reveals Conserved and Novel Molecular Functions of the Stigma in Rice. *Meina Li, Wenying Xu, Wenqiang Yang, Zhaosheng Kong, and Yongbiao Xue* 1797

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[W][OA] Between-Species Analysis of Short-Repeat Modules in Cell Wall and Sex-Related Hydroxyproline-Rich Glycoproteins of *Chlamydomonas*. Jae-Hyeok Lee, Sabine Waffenschmidt, Linda Small, and Ursula Goodenough 1813

[OA] Novel Insights into Seed Fatty Acid Synthesis and Modification Pathways from Genetic Diversity and Quantitative Trait Loci Analysis of the *Brassica* C Genome. Guy C. Barker, Tony R. Larson, Ian A. Graham, James R. Lynn, and Graham J. King 1827

[OA] Related Arabidopsis Serine Carboxypeptidase-Like Sinapoylglucose Acyltransferases Display Distinct But Overlapping Substrate Specificities. Christopher M. Fraser, Michael G. Thompson, Amber M. Shirley, John Ralph, Jessica A. Schoenherr, Taksina Sinlapadech, Mark C. Hall, and Clint Chapple 1986

## PLANTS INTERACTING WITH OTHER ORGANISMS

[OA] Impacts of *T-Phylloplanin* Gene Knockdown and of *Helianthus* and *Datura* Phylloplanins on *Peronospora tabacina* Spore Germination and Disease Potential. Antoaneta B. Kroumova, Ryan W. Shepherd, and George J. Wagner 1843

[C][W][OA] Auxin Influx Activity Is Associated with *Frankia* Infection during Actinorhizal Nodule Formation in *Casuarina glauca*. Benjamin Péret, Ranjan Swarup, Leen Jansen, Gaëlle Devos, Florence Auguy, Myriam Collin, Carole Santi, Valérie Hocher, Claudine Franche, Didier Bogusz, Malcolm Bennett, and Laurent Laplaze 1852

[C][W][OA] Resistance to *Botrytis cinerea* in *sitiens*, an Abscisic Acid-Deficient Tomato Mutant, Involves Timely Production of Hydrogen Peroxide and Cell Wall Modifications in the Epidermis. Bob Asselbergh, Katrien Curvers, Soraya C. França, Kris Audenaert, Marnik Vuylsteke, Frank Van Breusegem, and Monica Höfte 1863

[W][OA] Comparative Transcriptome Analysis Reveals Common and Specific Tags for Root Hair and Crack-Entry Invasion in *Sesbania rostrata*. Ward Capoen, Jeroen Den Herder, Stephane Rombauts, Jeroen De Gussem, Annick De Keyser, Marcelle Holsters, and Sofie Goormachtig 1878

Involvement of a Soybean ATP-Binding Cassette-Type Transporter in the Secretion of Genistein, a Signal Flavonoid in Legume-*Rhizobium* Symbiosis. Akifumi Sugiyama, Nobukazu Shitan, and Kazufumi Yazaki 2000

## WHOLE PLANT AND ECOPHYSIOLOGY

[W][OA] Leaf Maximum Photosynthetic Rate and Venation Are Linked by Hydraulics. Tim J. Brodrribb, Taylor S. Feild, and Gregory J. Jordan 1890

## SYSTEMS BIOLOGY, MOLECULAR BIOLOGY, AND GENE REGULATION

[W] A Genomics Approach Reveals That Aroma Production in Apple Is Controlled by Ethylene Predominantly at the Final Step in Each Biosynthetic Pathway. Robert J. Schaffer, Ellen N. Friel, Edwige J.F. Souleyre, Karen Bolitho, Kate Thodey, Susan Ledger, Judith H. Bowen, Jun-Hong Ma, Bhawana Nain, Daniel Cohen, Andrew P. Gleave, Ross N. Crowhurst, Bart J. Janssen, Jia-Long Yao, and Richard D. Newcomb 1899

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<sup>[C][OA]</sup> Mutations in the Type II Protein Arginine Methyltransferase AtPRMT5 Result in Pleiotropic Developmental Defects in Arabidopsis. Yanxi Pei, Lifang Niu, Falong Lu, Chunyan Liu, Jixian Zhai, Xiangfeng Kong, and Xiaofeng Cao 1913

<sup>[C][OA]</sup> Characterization of SSIIIa-Deficient Mutants of Rice: The Function of SSIIIa and Pleiotropic Effects by SSIIIa Deficiency in the Rice Endosperm. Naoko Fujita, Mayumi Yoshida, Tomonori Kondo, Kaori Saito, Yoshinori Utsumi, Takashi Tokunaga, Aiko Nishi, Hikaru Satoh, Jin-Hee Park, Jay-Lin Jane, Akio Miyao, Hirohiko Hirochika, and Yasunori Nakamura 2009

## CORRECTIONS

An IRE-Like AGC Kinase Gene, *MtIRE*, Has Unique Expression in the Invasion Zone of Developing Root Nodules in *Medicago truncatula*. C. Pislariu and R. Dickstein 2024

Mechanisms of Cross Talk between Gibberellin and Other Hormones. D. Weiss and N. Ori 2024

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

<sup>[W]</sup> Indicates Web-only data.

<sup>[OA]</sup> Open Access articles can be viewed online without a subscription.