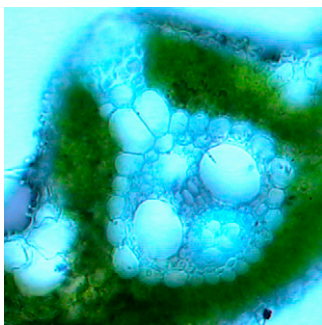


T H E
PLANT
C E L L

Volume 21 Number 3 March 2009

The electronic form of this issue, available at www.plantcell.org, is the journal of record.

ON THE COVER



Rice leaf development is important for photosynthesis and, hence, grain yield. Zhang et al. (pages 719–735) show that SHALLOT-LIKE1 (SLL1), a SHAQKYF class MYB family transcription factor belonging to the KANADI family, modulates leaf abaxial cell development and sustains the abaxial characteristics during leaf development. SLL1 deficiency leads to defective programmed cell death of abaxial mesophyll cells and results in increased chlorophyll and photosynthesis, which may facilitate attempts to increase the photosynthetic capacity of rice. The cover image shows the defective sclerenchymatous cells on the abaxial side of *sll1-1* leaves resulting in a broader distribution of mesophyll cells.

IN BRIEF

- CAMTA Proteins: A Direct Link between Calcium Signals and Cold Acclimation?** 697
Nancy A. Eckardt
- Opposites Attract: Some Phytochromes Do Not Form Homodimers** 698
Nancy R. Hofmann
- Uridine Ribohydrolase and the Balance between Nucleotide Degradation and Salvage** 699
Jennifer Mach
- A New Chlorophyll Degradation Pathway** 700
Nancy A. Eckardt

RESEARCH ARTICLES

- A Single Vegetative Actin Isovariant Overexpressed under the Control of Multiple Regulatory Sequences Is Sufficient for Normal *Arabidopsis* Development** [W](#)[O](#)[A](#) 701
Muthugapatti K. Kandasamy, Elizabeth C. McKinney, and Richard B. Meagher
- SHALLOT-LIKE1 Is a KANADI Transcription Factor That Modulates Rice Leaf Rolling by Regulating Leaf Abaxial Cell Development** [W](#)[O](#)[A](#) 719
Guang-Heng Zhang, Qian Xu, Xu-Dong Zhu, Qian Qian, and Hong-Wei Xue
- The WUSCHEL-Related Homeobox Gene *WOX11* Is Required to Activate Shoot-Borne Crown Root Development in Rice** [C](#)[W](#) 736
Yu Zhao, Yongfeng Hu, Mingqiu Dai, Limin Huang, and Dao-Xiu Zhou
- The ESCRT-Related CHMP1A and B Proteins Mediate Multivesicular Body Sorting of Auxin Carriers in *Arabidopsis* and Are Required for Plant Development** [W](#) 749
Christoph Spitzer, Francisca C. Reyes, Rafael Buono, Marek K. Sliwinski, Thomas J. Haas, and Marisa S. Otegui
- Pheophytin Pheophorbide Hydrolase (Pheophytinase) Is Involved in Chlorophyll Breakdown during Leaf Senescence in *Arabidopsis*** [W](#)[O](#)[A](#) 767
Silvia Schelbert, Sylvain Aubry, Bo Burla, Birgit Agne, Felix Kessler, Karin Krupinska, and Stefan Hörtensteiner
- Obligate Heterodimerization of *Arabidopsis* Phytochromes C and E and Interaction with the PIF3 Basic Helix-Loop-Helix Transcription Factor** [W](#) 786
Ted Clack, Ahmed Shokry, Matt Moffet, Peng Liu, Michael Faul, and Robert A. Sharrock

EDITORIAL BOARD**Editor in Chief**

Cathie Martin

Coeditors

Sarah M. Assmann
Jody Banks
Alice Barkan
Kathy Barton
David Baum
Sebastian Bednarek
James Birchler
Ulla Bonas
Christopher Bowler
Nigel Crawford
Xing Wang Deng
Allan Downie
Alisdair Fernie
Pascal Genschik
Jean T. Greenberg
Thomas Guilfoyle
David Jackson
Martin Kater
Patricia Leon
Clive Lloyd
William Lucas
Marjori Matzke
Blake Meyers
Joseph Noel
Michael Palmgren
Markus Pauly
Scott C. Peck
Barry Pogson
David Smyth
Chris J. Staiger
Keiko Sugimoto
Nicholas J. Talbot

Managing Editor

John Long

Senior Features Editor

Nancy A. Eckardt

Features Editor

Mary Williams

Science Editors

Greg Bertoni
Kathleen L. Farquharson
Nancy R. Hofmann
Jennifer M. Mach

Production Manager

Susan L. Entwistle

Manuscript Manager

Annette Kessler

Publications Director

Nancy A. Winchester

Publisher

American Society of
Plant Biologists
Executive Director,
Crispin Taylor

Editorial Office

15501 Monona Drive
Rockville, Maryland 20855-2768
Telephone: 301/296-0908
Fax: 301/279-2996
<http://www.aspb.org>

Online at www.plantcell.org

- Light Regulation of Gibberellin Biosynthesis in Pea Is Mediated through the COP1/HY5 Pathway** [W](#) 800
James L. Weller, Valérie Hecht, Jacqueline K. Vander Schoor, Sandra E. Davidson, and John J. Ross
- Suppression of the Barley *uroporphyrinogen III synthase* Gene by a *Ds* Activation Tagging Element Generates Developmental Photosensitivity** [W](#) 814
Michael A. Ayliffe, Anthony Agostino, Bryan C. Clarke, Robert Furbank, Susanne von Caemmerer, and Anthony J. Pryor
- Tissue- and Expression Level-Specific Chromatin Looping at Maize *b1* Epialleles** [W](#) 832
Marieke Louwers, Rechien Bader, Max Haring, Roel van Driel, Wouter de Laat, and Maike Stam
- Statolith Sedimentation Kinetics and Force Transduction to the Cortical Endoplasmic Reticulum in Gravity-Sensing *Arabidopsis* Columella Cells** [W](#) [OA](#) 843
Guenther Leitz, Byung-Ho Kang, Monica E.A. Schoenwaelder, and L. Andrew Staehelin
- Characterization of *Solanum tuberosum* Multicystatin and Its Structural comparison with Other Cystatins** [OA](#) 861
Mark S. Nissen, G.N. Mohan Kumar, Buhyun Youn, D. Benjamin Knowles, Ka Sum Lam, W. Jordan Ballinger, N. Richard Knowles, and ChulHee Kang
- Uridine-Ribohydrolase Is a Key Regulator in the Uridine Degradation Pathway of *Arabidopsis*** [W](#) 876
Benjamin Jung, Martin Flörchinger, Hans-Henning Kunz, Michaela Traub, Ruth Wartenberg, Wolfgang Jeblick, H. Ekkehard Neuhaus, and Torsten Möhlmann
- A Chloroplastic UDP-Glucose Pyrophosphorylase from *Arabidopsis* Is the Committed Enzyme for the First Step of Sulfolipid Biosynthesis** [W](#) [OA](#) 892
Yozo Okazaki, Mie Shimojima, Yuji Sawada, Kiminori Toyooka, Tomoko Narisawa, Keiichi Mochida, Hironori Tanaka, Fumio Matsuda, Akiko Hirai, Masami Yokota Hirai, Hiroyuki Ohta, and Kazuki Saito
- Disruption of Adenosine-5'-Phosphosulfate Kinase in *Arabidopsis* Reduces Levels of Sulfated Secondary Metabolites** [W](#) 910
Sarah G. Mugford, Naoko Yoshimoto, Michael Reichelt, Markus Wirtz, Lionel Hill, Sam T. Mugford, Yoshimi Nakazato, Masaaki Noji, Hideki Takahashi, Robert Kramell, Tamara Gigolashvili, Ulf-Ingo Flügge, Claus Wasternack, Jonathan Gershenzon, Rüdiger Hell, Kazuki Saito, and Stanislav Kopriva
- Two *Chlamydomonas* CTR Copper Transporters with a Novel Cys-Met Motif Are Localized to the Plasma Membrane and Function in Copper Assimilation** [W](#) 928
M. Dudley Page, Janette Kropat, Patrice P. Hamel, and Sabeeha S. Merchant
- Mitogen-Activated Protein Kinases 3 and 6 Are Required for Full Priming of Stress Responses in *Arabidopsis thaliana*** [W](#) [OA](#) 944
Gerold J.M. Beckers, Michal Jaskiewicz, Yidong Liu, William R. Underwood, Sheng Yang He, Shuqun Zhang, and Uwe Conrath
- Methyl Salicylate Production and Jasmonate Signaling Are Not Essential for Systemic Acquired Resistance in *Arabidopsis*** [W](#) 954
Elham Attaran, Tatiana E. Zeier, Thomas Griebel, and Jürgen Zeier
- Roles for *Arabidopsis* CAMTA Transcription Factors in Cold-Regulated Gene Expression and Freezing Tolerance** [W](#) [OA](#) 972
Colleen J. Doherty, Heather A. Van Buskirk, Susan J. Myers, and Michael F. Thomashow
- The Gene Controlling the *Indole Glucosinolate Modifier1* Quantitative Trait Locus Alters Indole Glucosinolate Structures and Aphid Resistance in *Arabidopsis*** [W](#) 985
Marina Pfalz, Heiko Vogel, and Juergen Kroymann

HISTONE MONOUBIQUITINATION1 Interacts with a Subunit of the Mediator Complex and Regulates Defense against Necrotrophic Fungal Pathogens in *Arabidopsis* 1000

Rahul Dhawan, Hongli Luo, Andrea Maria Foerster, Synan AbuQamar, Hai-Ning Du, Scott D. Briggs, Ortrun Mittelsten Scheid, and Tesfaye Mengiste

CORRECTIONS

Yanchun Yu, Tian Tang, Qian Qian, Yonghong Wang, Meixian Yan, Dali Zeng, Bin Han, Chung-I Wu, Suhua Shi, and Jiayang Li (2008). Independent Losses of Function in a Polyphenol Oxidase in Rice: Differentiation in Grain Discoloration between Subspecies and the Role of Positive Selection under Domestication. *Plant Cell* 20: 2946–2959. 1020

Gregory Bertoni (2008). Dynamic Evolution of *Oryza* Genomes. *Plant Cell* 20: 3184. 1021

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

☒ Online version contains Web-only data.

☐ Open Access articles can be viewed online without a subscription.



© 2009 American Society of Plant Biologists. All rights reserved. Printed on acid-free paper effective with Volume 1, Number 1, January 1989. Printed in the United States of America.

The Plant Cell (ISSN 1040-4651, online ISSN 1531-298X) is published monthly (one volume per year) by the American Society of Plant Biologists, 15501 Monona Drive, Rockville, MD 20855-2768, and is produced by Dartmouth Journal Services, Waterbury, VT. The institutional price for the print and online versions is based on type of institution; contact institution@aspb.org. A subscription includes both *The Plant Cell* and *Plant Physiology*; single copies may be purchased for \$95 each, plus \$10 shipping (U.S.) or \$12 (outside U.S.). Members of the American Society of Plant Biologists may subscribe to *The Plant Cell* for \$185. Nonmember individuals may subscribe for \$375. For matters regarding subscriptions, contact Suzanne Cholwek, ASPB, 15501 Monona Drive, Rockville, MD 20855-2768; telephone 301/296-0926; fax 301/251-6740; e-mail scholwek@aspb.org. Notify ASPB in writing within 3 months (domestic) or 6 months (foreign) of issue date, and defective copies or copies lost in the mail will be replaced. Send all inquiries regarding display advertising to FASEB AdNet, 9650 Rockville Pike, Bethesda, MD 20814-3998; telephone 301/634-7791; fax 301/634-7153; e-mail adnet@faseb.org. Periodicals postage paid at Rockville, MD 20850, and at additional mailing offices.

Postmaster: Send address changes to *The Plant Cell*, American Society of Plant Biologists, 15501 Monona Drive, Rockville, MD 20855-2768. The online version of *The Plant Cell* is available at www.plantcell.org.

Permission to Reprint: Permission to make digital or hard copies of part or all of a work published in *The Plant Cell* is granted without fee for personal or classroom use provided that copies are not made or distributed for profit or commercial advantage and that copies bear the full citation and the following notice on the first page: "Copyright American Society of Plant Biologists." For all other kinds of copying, request permission in writing from Nancy A. Winchester, Publications Director, ASPB headquarters.

This information is current as of September 27, 2020

Permissions	https://www.copyright.com/ccc/openurl.do?sid=pd_hw1532298X&issn=1532298X&WT.mc_id=pd_hw1532298X
eTOCs	Sign up for eTOCs at: http://www.plantcell.org/cgi/alerts/ctmain
CiteTrack Alerts	Sign up for CiteTrack Alerts at: http://www.plantcell.org/cgi/alerts/ctmain
Subscription Information	Subscription Information for <i>The Plant Cell</i> and <i>Plant Physiology</i> is available at: http://www.aspb.org/publications/subscriptions.cfm