ON THE COVER

Roots must circumnavigate barriers in soil to optimize nutrient and water access as well as to physically support aerial organs. The integration of environmental stimuli controlling root architecture and growth is poorly understood. Chen et al. (pages 1972–1991) report the identification of regulatory components of root thigmomorphogenesis. The phylogenetically related Arabidopsis thaliana genes MLO4 and MLO11 encode heptahelical, plasma membrane–localized proteins predominantly expressed in the root tip. Null mutations in either of these genes resulted in anisotropic, chiral root expansion manifesting as tightly curled root patterns upon contact with solid surfaces. A combination of genetic analysis, chemical genetics, and cell biology showed that cooperative function of MLO4 and MLO11 in controlling root thigmomorphogenesis is auxin dependent. The cover illustration shows a typical touch-induced root coiling pattern (viewed from the top) of a 6-d-old Arabidopsis mlo4 mutant seedling on a hard agar medium.

IN BRIEF

Targeted Overexpression of a Sodium Transporter in the Root Stele Increases Salinity Tolerance
Kathleen L. Farquharson

Flipping the Centromere Switch: Reactivation of a Dormant Centromere in Maize
Jennifer Mach

REVIEW

What Has Natural Variation Taught Us about Plant Development, Physiology, and Adaptation?
Carlos Alonso-Blanco, Mark G.M. Aarts, Leonie Bentsink, Joost J.B. Keurentjes, Matthieu Reymond, Dick Vreugdenhil, and Maarten Koornneef

RESEARCH ARTICLES

Phylogenomic Analysis Demonstrates a Pattern of Rare and Ancient Horizontal Gene Transfer between Plants and Fungi
Thomas A. Richards, Darren M. Soanes, Peter G. Foster, Guy Leonard, Christopher R. Thornton, and Nicholas J. Talbot

Comparative Analysis between Homoeologous Genome Segments of Brassica napus and Its Progenitor Species Reveals Extensive Sequence-Level Divergence
Foo Cheung, Martin Trick, Nizar Drou, Yong Pyo Lim, Jee-Young Park, Soo-Jin Kwon, Jin-A Kim, Rod Scott, J. Chris Pires, Andrew H. Paterson, Chris Town, and Ian Bancroft

Reactivation of an Inactive Centromere Reveals Epigenetic and Structural Components for Centromere Specification in Maize
Fangpu Han, Zhi Gao, and James A. Birchler

Arabidopsis DUO POLLEN3 Is a Key Regulator of Male Germline Development and Embryogenesis
Lynnette Brownfield, Said Hafidh, Anjusha Durbary, Hoda Khatab, Anna Sidorova, Peter Doerner, and David Twell

Partitioning the Apical Domain of the Arabidopsis Embryo Requires the BOBBER1 NudC Domain Protein
Rebecca Joy Jurkuta, Nicholas J. Kaplinsky, Jennifer E. Spindel, and M. Kathryn Barton
Two Seven-Transmembrane Domain MILDEW RESISTANCE LOCUS O Proteins Cofunction in *Arabidopsis* Root Thigmomorphogenesis

Zhongying Chen, Sandra Noir, Mark Kwaaitaal, H. Andreas Hartmann, Ming-Jing Wu, Yashwanti Mudgil, Poornima Sukumar, Gloria Muyad, Ralph Panstruga, and Alan M. Jones

The *Arabidopsis* PLEIOTROPIC DRUG RESISTANCE8/ABCG36 ATP Binding Cassette Transporter Modulates Sensitivity to the Auxin Precursor Indole-3-Butyric Acid

Lucia C. Strader and Bonnie Bartel

The Histidine Kinases CYTOKININ-INDEPENDENT1 and *ARABIDOPSIS HISTIDINE KINASE2* and 3 Regulate Vascular Tissue Development in *Arabidopsis* Shoots

Jan Hejátko, Hojin Ryu, Gyung-Tae Kim, Romana Dobesová, Sunhwa Choi, Sang Mi Choi, Přemysl Souček, Jakub Horák, Blanka Pekárová, Klaus Palme, Břetislav Brzobohatý, and Idoo Hwang

The Maize Transcription Factor Myb-Related Protein-1 Is a Key Regulator of the Differentiation of Transfer Cells

Elisa Gómez, Joaquín Royo, Luis M. Muñiz, Olivier Sellam, Wyatt Paul, Denise Gerentes, Cristina Barrero, Maribel López, Pascual Perez, and Gregorio Hueros

A Structural Basis for the pH-Dependent Xanthophyll Cycle in *Arabidopsis thaliana*

Pascal Amoux, Tomas Morosinotto, Giorgia Saga, Roberto Bassi, and David Pignol

Aberrant mRNA Transcripts and the Nonsense-Mediated Decay Proteins UPF2 and UPF3 Are Enriched in the *Arabidopsis* Nucleolus

Sang Hyon Kim, Olga A. Koroleva, Dominika Lewandowska, Ali F. Pendle, Gillian P. Clark, Craig G. Simpson, Peter J. Shaw, and John W.S. Brown

*Arabidopsis* RNA Adenosine Deaminase Arginine Edits the Wobble Nucleotide of Chloroplast tRNA<sup>ACG</sup> and Is Essential for Efficient Chloroplast Translation

Etienne Delannoy, Monique Le Ret, Emmanuelle Faivre-Nitschke, Gonzalo M. Estavillo, Marc Bergdoll, Nicolas L. Taylor, Barry J. Pogson, Ian Small, Patrice Imbault, and José M. Gualberto

Posttranslational Elevation of Cell Wall Invertase Activity by Silencing Its Inhibitor in Tomato Delays Leaf Senescence and Increases Seed Weight and Fruit Hexose Level

Ye Jin, Di-An Ni, and Yong-Ling Ruan

Helical Growth of the *Arabidopsis* Mutant *tortifolia2* Does Not Depend on Cell Division Patterns but Involves Handed Twisting of Isolated Cells

Henrik Buschmann, Monika Hauptmann, Dierk Niessing, Clive W. Lloyd, and Anton R. Schäffner

Endocytosis and Endosomal Regulation of the S-Receptor Kinase during the Self-Incompatibility Response in *Brassica oleracea*

Rumen Ivanov and Thierry Gaude

Sieve Element Ca<sup>2+</sup> Channels as Relay Stations between Remote Stimuli and Sieve Tube Occlusion in *Vicia faba*

Alexandra C.U. Furch, Aart J.E. van Bel, Mark D. Fricker, Hubert H. Felle, Maike Fuchs, and Jens B. Hafke

Identification and Characterization of Maize and Barley Lsi2-Like Silicon Efflux Transporters Reveals a Distinct Silicon Uptake System from That in Rice

Namiki Mitiy, Yukako Chiba, Naoki Yamaji, and Jian Feng Ma

The High Light Response in *Arabidopsis* Involves ABA Signaling between Vascular and Bundle Sheath Cells

Gregorio Galvez-Valdivieso, Michael J. Fryer, Tracy Lawson, Katie Slatterty, William Truman, Nicholas Smirnoff, Tadao Asami, William J. Davies, Alan M. Jones, Neil R. Baker, and Philip M. Mullineaux

Shoot Na<sup>+</sup> Exclusion and Increased Salinity Tolerance Engineered by Cell Type-Specific Alteration of Na<sup>+</sup> Transport in *Arabidopsis*

Inge S. Møller, Matthew Gilliam, Deepa Jha, Gwenda M. Mayo, Stuart J. Roy, Juliet C. Coates, Jim Haseloff, and Mark Tester
Downy Mildew Resistance in *Arabidopsis* by Mutation of HOMOSERINE KINASE

Mireille van Damme, Tieme Zeilmaker, Joyce Elberse, Annemiek Andel, Monique de Sain-van der Velden, and Guido van den Ackerveken

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.
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>eTOCs</td>
<td>Sign up for eTOCs at: <a href="http://www.plantcell.org/cgi/alerts/ctmain">http://www.plantcell.org/cgi/alerts/ctmain</a></td>
</tr>
<tr>
<td>CiteTrack Alerts</td>
<td>Sign up for CiteTrack Alerts at: <a href="http://www.plantcell.org/cgi/alerts/ctmain">http://www.plantcell.org/cgi/alerts/ctmain</a></td>
</tr>
<tr>
<td>Subscription Info</td>
<td>Subscription Information for <em>The Plant Cell</em> and <em>Plant Physiology</em> is available at:</td>
</tr>
<tr>
<td></td>
<td><a href="http://www.aspb.org/publications/subscriptions.cfm">http://www.aspb.org/publications/subscriptions.cfm</a></td>
</tr>
</tbody>
</table>