ON THE COVER

Anther development depends on coordinated cell expansion in order to elongate filaments and dehisce anthers. Bassil et al. (pages 3482–3497) provide evidence that two members of the Arabidopsis Na+/H+-type family of vacuolar antiporters (NHX), NHX1 and NHX2, are specifically required for cell expansion, particularly in rapidly elongating tissues such as filaments and hypocotyls. The authors demonstrate that NHX1 and NHX2 control intravacuolar potassium and pH to regulate cell expansion. The lack of NHX1 and NHX2 leads to short filaments, nondehiscent anthers, unsuccessful pollination, and a lack of silique formation. The cover displays a scanning electron micrograph of a dehiscent anther about to release its pollen.

IN BRIEF

Function and Evolution of a MicroRNA with a Role in Reproductive Growth in Tomato
Nancy A. Eckardt

3083

TERMINAL FLOWER1 Acts in Transcriptional Repression
Jennifer Mach

3084

MutS HOMOLOG1 Stabilizes Plastid and Mitochondrial Genomes
Nancy R. Hofmann

3085

A Sense of Self: Exploring the Selfing Syndrome in Capsella
Nancy A. Eckardt

3086

Functional Analysis of Arabidopsis NHX Antiporters: The Role of the Vacuole in Cellular Turgor and Growth
Nancy A. Eckardt and Gerald A. Berkowitz

3087

REVIEW

The JAZ Proteins: A Crucial Interface in the Jasmonate Signaling Cascade
Laurens Pauwels and Alain Goossens

3089

LARGE-SCALE BIOLOGY ARTICLES

Functional Network Construction in Arabidopsis Using Rule-Based Machine Learning on Large-Scale Data Sets
George W. Bassel, Enrico Glaab, Julietta Marquez, Michael J. Holdsworth, and Jaume Bacardit

3101

Targeted Identification of Short Interspersed Nuclear Element Families Shows Their Widespread Existence and Extreme Heterogeneity in Plant Genomes
Torsten Wenke, Thomas Döbel, Thomas Rosleff Sørensen, Holger Junghans, Bernd Weisshaar, and Thomas Schmidt

3117

RESEARCH ARTICLES

Changes in Twelve Homoeologous Genomic Regions in Soybean following Three Rounds of Polyploidy
Andrew J. Severin, Steven B. Cannon, Michelle M. Graham, David Grant, and Randy C. Shoemaker

3129
Nonessential Plastid-Encoded Ribosomal Proteins in Tobacco: A Developmental Role for Plastid Translation and Implications for Reductive Genome Evolution

Tobias T. Fleischmann, Lars B. Scharff, Sibah Alkatib, Sebastian Hasdorf, Mark A. Schöttler, and Ralph Bock

Genetics, Evolution, and Adaptive Significance of the Selfing Syndrome in the Genus Capsella

Adrien Sicard, Nicola Stacey, Katrin Hermann, Jimmy Dessoly, Barbara Neuffer, Isabel Bäurle, and Michael Lenhard

Arabidopsis TERMINAL FLOWER1 Is Involved in the Regulation of Flowering Time and Inflorescence Development through Transcriptional Repression

Shigeru Hanano and Koji Goto

Function and Evolution of a MicroRNA That Regulates a Ca²⁺-ATPase and Triggers the Formation of Phased Small Interfering RNAs in Tomato Reproductive Growth

Ying Wang, Asuka Itaya, Xuehua Zhong, Yang Wu, Jianfeng Zhang, Esther van der Knaap, Richard Olmstead, Yijun Qi, and Biao Ding

Tissue-Specific Expression of FLOWERING LOCUS T in Arabidopsis Is Maintained Independently of Polycomb Group Protein Repression

Sara Farrona, Frazer L. Thorpe, Julia Engelhorn, Jessika Adrian, Xue Dong, Liron Sarid-Krebs, Justin Goodrich, and Franziska Turk

A Wheat Homolog of MOTHER OF FT AND TFL1 Acts in the Regulation of Germination

Shingo Nakamura, Fumitaka Abe, Hiroyuki Kawahigashi, Kou Nakazono, Akemi Tagiri, Takashi Matsumoto, Shigeko Utsugi, Taichī Ogawa, Hirokazu Hanada, Hiroki Ishida, Masahiko Mori, Kanako Kawaura, Yasunari Ogihara, and Hideho Miura

A Reduced-Function Allele Reveals That EARLY FLOWERING3 Repressive Action on the Circadian Clock Is Modulated by Phytochrome Signals in Arabidopsis

Elsebeth Kolmos, Eva Herrero, Nora Bujdoso, Andrew J. Millar, Réka Tóth, Peter Gyula, Ferenc Nagy, and Seth J. Davis

WOX4 Imparts Auxin Responsiveness to Cambium Cells in Arabidopsis

Stefanie Suer, Javier Agusti, Pablo Sanchez, Martina Schwarz, and Thomas Greb

Molecular Profiling of Stomatal Meristemoids Reveals New Component of Asymmetric Cell Division and Commonalities among Stem Cell Populations in Arabidopsis

Lynn Jo Pillitteri, Kylee M. Peterson, Robin J. Horst, and Keiko U. Torii

LAX PANICLE2 of Rice Encodes a Novel Nuclear Protein and Regulates the Formation of Axillary Meristems

Hiroaki Tabuchi, Yu Zhang, Susumu Hattori, Minami Omae, Sae Shimizu-Sato, Tetsuo Oikawa, Qian Qian, Minoru Nishimura, Hidemi Kitano, He Xie, Xiaohua Fang, Hitoshi Yoshida, Junko Kyozuka, Fan Chen, and Yutaka Sato

POD1 Regulates Pollen Tube Guidance in Response to Micropylar Female Signaling and Acts in Early Embryo Patterning in Arabidopsis

Hong-Ju Li, Yong Xue, Dong-Jie Jia, Tong Wang, Dong-Qiao Shi, Jie Liu, Feng Cui, Qi Xie, De Ye, and Wei-Cai Yang
Biosynthesis and Defensive Function of N'-Acetylornithine, a Jasmonate-Induced Arabidopsis Metabolite

Adewale M. Adio, Clare L. Casteel, Martin De Vos, Jae Hak Kim, Vijay Joshi, Baohua Li, Caroline Juéry, Josquin Daron, Daniel J. Kliebenstein, and Georg Jander

The Transcription Factor ABI4 Is Required for the Ascorbic Acid–Dependent Regulation of Growth and Regulation of Jasmonate-Dependent Defense Signaling Pathways in Arabidopsis

Pavel I. Kerchev, Till K. Pellny, Pedro Diaz Vivancos, Guy Kiddle, Peter Hedden, Simon Driscoll, Hélène Vanacker, Paul Verrier, Robert D. Hancock, and Christine H. Foyer

The Basic Helix-Loop-Helix Transcription Factor MYC2 Directly Represses PLETHORA Expression during Jasmonate-Mediated Modulation of the Root Stem Cell Niche in Arabidopsis

Qian Chen, Jiaqiang Sun, Qingze Zhai, Wenkun Zhou, Linlin Qi, Li Xu, Bao Wang, Rong Chen, Hongling Jiang, Jing Qi, Xuguang Li, Klaus Palme, and Chuanyou Li

A Plasmodesmata-Localized Protein Mediates Crosstalk between Cell-to-Cell Communication and Innate Immunity in Arabidopsis

Jung-Youn Lee, Xu Wang, Weier Cui, Ross Sager, Shannon Modla, Kirk Czymmek, Boris Zybaliow, Klaas van Wijk, Chong Zhang, Hua Lu, and Venkatachalam Lakshmanan

Arabidopsis RTNLB1 and RTNLB2 Reticulon-Like Proteins Regulate Intracellular Trafficking and Activity of the FLS2 Immune Receptor

Hyoungh Yool Lee, Christopher Hyde Bowen, George Viorel Popescu, Hong-Gu Kang, Naohiro Kato, Shisong Ma, Savithranna Dinesh-Kumar, Michael Snyder, and Sorina Claudia Popescu

CFL1, a WW Domain Protein, Regulates Cuticle Development by Modulating the Function of HDG1, a Class IV Homeodomain Transcription Factor, in Rice and Arabidopsis

Renrong Wu, Shibai Li, Shan He, Friedrich Waßmann, Caihong Yu, Genji Qin, Lukas Schreiber, Li-Jia Qu, and Hongya Gu

Salt Stress–Induced Disassembly of Arabidopsis Cortical Microtubule Arrays Involves 26S Proteasome–Dependent Degradation of SPIRAL1

Songhu Wang, Jasmina Kurepa, Takashi Hashimoto, and Jan A. Smalle

MutS HOMOLOG1 Is a Nucleoid Protein That Alters Mitochondrial and Plastid Properties and Plant Response to High Light


Identification of the 7-Hydroxymethyl Chlorophyll a Reductase of the Chlorophyll Cycle in Arabidopsis

Miki Meguro, Hisashi Ito, Atsushi Takabayashi, Ryuichi Tanaka, and Ayumi Tanaka

Tetrapyrrole Synthesis of Photosynthetic Chromerids Is Likely Homologous to the Unusual Pathway of Apicomplexan Parasites

Luděk Kořený, Roman Sobotka, Jan Janouškovec, Patrick J. Keeling, and Miroslav Oborník

Multivesicular Bodies Mature from the Trans-Golgi Network/Early Endosome in Arabidopsis

David Scheuring, Corrado Viotti, Falco Krüger, Fabian Küntzl, Slike Sturm, Julia Bubeck, Stefan Hillmer, Lorenzo Frigerio, David G. Robinson, Peter Pimpl, and Karin Schumacher
The Arabidopsis Na+/H+ Antiporters NHX1 and NHX2 Control Vacuolar pH and K+ Homeostasis to Regulate Growth, Flower Development, and Reproduction

Elias Bassil, Hiromi Tajima, Yin-Chih Liang, Masa-aki Ohto, Koichiro Ushijima, Ryohei Nakano, Tomoya Esumi, Ardian Coku, Mark Belmonte, and Eduardo Blumwald

The Xanthomonas Type III Effector XopD Targets the Arabidopsis Transcription Factor MYB30 to Suppress Plant Defense

Joanne Canonne, Daniel Marino, Alain Jaunoue, Cécile Pouzet, Christian Brière, Dominique Roby, and Susana Rivas

Nicotiana attenuata LECTIN RECEPTOR KINASE1 Suppresses the Insect-Mediated Inhibition of Induced Defense Responses during Manduca sexta Herbivory

Paola A. Gilardoni, Christian Hettenhausen, Ian T. Baldwin, and Gustavo Bonaventure

Condensin II Alleviates DNA Damage and Is Essential for Tolerance of Boron Overload Stress in Arabidopsis

Takuya Sakamoto, Yayoi Tsujimoto Inui, Shimpei Uraguchi, Takeshi Yoshizumi, Sachihiro Matsunaga, Minami Mastui, Masaaki Umeda, Kiichi Fukui, and Toru Fujiwara

Boron-Dependent Degradation of NIP5;1 mRNA for Acclimation to Excess Boron Conditions in Arabidopsis

Mayuki Tanaka, Junpei Takano, Yukako Chiba, Fabien Lombardo, Yuji Ogasawara, Hitoshi Onouchi, Satoshi Naito, and Toru Fujiwara

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.