On the Cover: Many plants use self-incompatibility (SI) to reject genetically identical (“self”) pollen to prevent inbreeding. In *Papaver rhoeas* (the field poppy), SI triggers a Ca²⁺-dependent signaling network in incompatible pollen, involving several targets, including actin depolymerization and phosphorylation of soluble inorganic pyrophosphatases. Pollen tube inhibition and programmed cell death (PCD) result. A mitogen-activated protein kinase (MAPK), p56, activated by SI, had been previously identified, but its role was not known. In this issue, Li et al. (pp. 236–245) establish a link between the SI-activated MAPK and initiation of PCD in incompatible *Papaver* pollen. Their data implicate MAPK involvement in regulating SI-induced caspase-3-like/DEVDase activation and progression of PCD in incompatible pollen. Although MAPK signaling in PCD is well established, it has not previously been shown to be involved in SI. The cover photograph shows a flower of *P. rhoeas* (var. Shirley) being pollinated by a bee. The image was created by Noni Franklin-Tong.
Changes in Respiratory Mitochondrial Machinery and Cytochrome and Alternative Pathway Activities in Response to Energy Demand Underlie the Acclimation of Respiration to Elevated CO₂ in the Invasive Opuntia ficus-indica. Nuria Gomez-Casanovas, Elena Blanc-Betes, Miquel A. Gonzalez-Meler, and Joaquim Azcon-Bieto 49


CELL BIOLOGY AND SIGNAL TRANSDUCTION

Characterization of AgMaT2, a Plasma Membrane Mannitol Transporter from Celery, Expressed in Phloem Cells, Including Phloem Parenchyma Cells. Marjorie Juchaux-Cachau, Lucie Landouar-Arsivaud, Jean-Philippe Pichaut, Claire Campion, Benoît Porcheron, Julien Jeuffre, Nathalie Noiraud-Romy, Philippe Simonneau, Laurence Maurousset, and Rémi Lemoine 62

RTE1 Is a Golgi-Associated and ETR1-Dependent Negative Regulator of Ethylene Responses. Xin Zhou, Qian Liu, Fang Xie, and Chi-Kuang Wen 75

A Mitogen-Activated Protein Kinase Signals to Programmed Cell Death Induced by Self-Incompatibility in Papaver Pollen. Shutian Li, Jozef Šamaj, and Vernonica E. Franklin-Tong 236

DEVELOPMENT AND HORMONE ACTION

A Putative Hydroxysteroid Dehydrogenase Involved in Regulating Plant Growth and Development. Fengling Li, Tadao Asami, Xianzhong Wu, Edward W.T. Tsang, and Adrian J. Cutler 87

A Putative CCAAT-Binding Transcription Factor Is a Regulator of Flowering Timing in Arabidopsis. Xiaoning Cai, Jenny Ballif, Saori Endo, Elizabeth Davis, Mingxiang Liang, Dong Chen, Daryll DeWald, Joel Kreps, Tong Zhu, and Yajun Wu 98

Gibberellin Regulation of Fruit Set and Growth in Tomato. Juan Carlos Serrani, Rafael Sanjuán, Omar Ruiz-Rivero, Mariano Fos, and José Luis García-Martínez 246

ENVIRONMENTAL STRESS AND ADAPTATION TO STRESS

A Study of Gibberellin Homeostasis and Cryptochrome-Mediated Blue Light Inhibition of Hypocotyl Elongation. Xiaoying Zhao, Xuhong Yu, Eloise Foo, Gregory M. Symons, Javier Lopez, Krishnaprasad T. Bendehakkalu, Jing Xiang, James L. Weller, Xuanming Liu, James B. Reid, and Chentao Lin 106


The Arabidopsis BAP1 and BAP2 Genes Are General Inhibitors of Programmed Cell Death. Huijun Yang, Shuhua Yang, Yongqing Li, and Jian Hua 135

Continued on next page
A Bacterial Transgene for Catalase Protects Translation of D1 Protein during Exposure of Salt-Stressed Tobacco Leaves to Strong Light.  
Khaled Al-Taweel, Toshio Iwaki, Yukinori Yabuta, Shigeru Shigeoka, Norio Murata, and Akira Wadano

Effect of Secondary Metabolites Associated with Anaerobic Soil Conditions on Ion Fluxes and Electrophysiology in Barley Roots.  
Jiayin Pang, Tracey Cuin, Lana Shabala, Meixue Zhou, Neville Mendham, and Sergey Shabala

GENETICS, GENOMICS, AND MOLECULAR EVOLUTION

Differential Expression of Genes Important for Adaptation in Capsella bursa-pastoris (Brassicaceae).  
Tanja Slotte, Karl Holm, Lauren M. McIntyre, Ulf Lagercrantz, and Martin Lascoux

PLANTS INTERACTING WITH OTHER ORGANISMS

A Rhizosphere Fungus Enhances Arabidopsis Thermotolerance through Production of an HSP90 Inhibitor.  

Medicago LYK3, an Entry Receptor in Rhizobial Nodulation Factor Signaling.  
Patrick Smit, Erik Limpens, Rene Geurts, Elena Fedorova, Elena Dolgikh, Clare Gough, and Ton Bisseling

The Medicago truncatula DMI1 Protein Modulates Cytosolic Calcium Signaling.  
Edgar Peiter, Jongho Sun, Anne B. Heckmann, Muthusubramanian Venkateshwaran, Brendan K. Riely, Marisa S. Otegui, Anne Edwards, Glenn Freskour, Michael G. Hahn, Douglas R. Cook, Dale Sanders, Giles E.D. Oldroyd, J. Allan Downie, and Jean-Michel Ané

AtNUDT7, a Negative Regulator of Basal Immunity in Arabidopsis, Modulates Two Distinct Defense Response Pathways and Is Involved in Maintaining Redox Homeostasis.  
Xiaochun Ge, Guo-Jing Li, Sheng-Bing Wang, Huiyen Zhu, Tong Zhu, Xun Wang, and Yiji Xia

SYSTEMS BIOLOGY, MOLECULAR BIOLOGY, AND GENE REGULATION

Novel Tonoplast Transporters Identified Using a Proteomic Approach with Vacuoles Isolated from Cauliflower Buds.  
Ulrike G. Schmidt, Anne Endler, Silvia Schelbert, Arco Brunner, Magali Schnell, H. Ekkehard Neuhaus, Danièle Marty-Mazars, Francis Marty, Sacha Baginsky, and Enrico Martinoia

A Sepal-Expressed ADP-Glucose Pyrophosphorylase Gene (NtAGP) Is Required for Petal Expansion Growth in 'Xanthi' Tobacco.  
Man Sup Kwak, Sung Ran Min, Si-Myung Lee, Kyung-Nam Kim, Jang Ryol Liu, Kyung-Hee Paek, Jeong Sheop Shin, and Jung Myung Bae

Continued from preceding page

Continued on next page
CORRECTIONS

AtATM3 Is Involved in Heavy Metal Resistance in Arabidopsis.  D.-Y. Kim, L. Bovet, S. Kushnir, E. W. Noh, E. Martinoia, and Y. Lee

Expression of Genomic AtCYCD2;1 in Arabidopsis Induces Cell Division at Smaller Cell Sizes: Implications for the Control of Plant Growth.  R. Qi and P. C. L. John


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

[W] Indicates Web-only data.

[OA] Open Access articles can be viewed online without a subscription.