On the Cover: Strawberry (Fragaria × ananassa) fruit flavor and aroma are among the most appreciated quality traits by consumers; as such, the improvement of strawberry aroma is receiving increasing importance in breeding programs. However, breeding for better aroma, particularly in polyploid crops, presents many challenges and requires a previous knowledge of the genetic determinants controlling its variation. More than 300 volatile compounds have been detected in strawberry, although the regulatory mechanisms controlling their content remain largely unknown. In this issue, Zorrilla-Fontanesi et al. (pp. 851–870) carried out a metabolomic and genetic analysis of strawberry fruit volatiles and identified genomic regions controlling their variation. Using a candidate gene approach and molecular analyses, their study further shows that the gene FaOMT is the locus controlling natural variation on mesifurane content and identifies a polymorphism in its promoter that it is likely responsible for both driving high FaOMT expression in ripe strawberry receptacle and mesifurane production. The cover picture depicts a strawberry field in Huelva, Spain, where the mapping population was grown and where more than 95% of Spanish strawberry fruit is produced. Below, the graph shows total ion counts of a gas chromatography-mass spectrometry chromatogram of the volatile fraction from ripe strawberry fruit. Image and design by Jose L. Rambla and Iraida Amaya.

ON THE INSIDE

Peter V. Minorsky

GENOME ANALYSIS


BREAKTHROUGH TECHNOLOGIES


SCIENTIFIC CORRESPONDENCE


RESEARCH ARTICLES

BIOCHEMICAL PROCESSES AND MACROMOLECULAR STRUCTURES


[W] The Plastid Genome-Encoded Ycf4 Protein Functions as a Nonessential Assembly Factor for Photosystem I in Higher Plants. Katharina Krech, Stephanie Ruf, Fifi F. Masduki, Wolfram Thiele, Dominika Bednarczyk, Christin A. Albus, Nadine Tiller, Claudia Hasse, Mark A. Schöttler, and Ralph Bock

[W] Atypical Thioredoxins in Poplar: The Glutathione-Dependent Thioredoxin-Like 2.1 Supports the Activity of Target Enzymes Possessing a Single Redox Active Cysteine. Kamel Chibani, Lionel Tarrago, José Manuel Gualberto, Gunnar Wingsle, Pascal Rey, Jean-Pierre Jacquot, and Nicolas Rouhier
The Acyl-Acyl Carrier Protein Synthetase from *Synechocystis* sp. PCC 6803 Mediates Fatty Acid Import.  
Simon von Berlepsch, Hans-Henning Kunz, Susanne Brodesser, Patrick Fink, Kay Marin, Ulf-Ingo Flügge, and Markus Gierth
606

Characterization of Three O-Methyltransferases Involved in Noscapine Biosynthesis in Opium Poppy.  
Thu-Thuy T. Dang and Peter J. Facchini
618

**CELL BIOLOGY AND SIGNAL TRANSDUCTION**

Auxin Activates the Plasma Membrane H⁺-ATPase by Phosphorylation during Hypocotyl Elongation in Arabidopsis.  
Koji Takahashi, Ken-ichiro Hayashi, and Toshinori Kinoshita
632

ATP-Binding Cassette B4, an Auxin-Efflux Transporter, Stably Associates with the Plasma Membrane and Shows Distinctive Intracellular Trafficking from That of PIN-FORMED Proteins.  
Misuk Cho, Zee-Won Lee, and Hyung-Taeg Cho
642

Pattern of Deposition of Cell Wall Polysaccharides and Transcript Abundance of Related Cell Wall Synthesis Genes during Differentiation in Barley Endosperm.  
655

Purification and Characterization of ZmRIP1, a Novel Reductant-Inhibited Protein Tyrosine Phosphatase from Maize.  
Bingbing Li, Yanxia Zhao, Liyan Liang, Huibo Ren, Yu Xing, Lin Chen, Mingzhu Sun, Yuahua Wang, Yu Han, Haifeng Jia, Conglin Huang, Zhongyi Wu, and Wensuo Jia
671

Characterization of the Plasma Membrane H⁺-ATPase in the Liverwort *Marchantia polymorpha*.  
Masaki Okamura, Shin-ichiro Inoue, Koji Takahashi, Kimitsune Ishizaki, Takayuki Kohchi, and Toshinori Kinoshita
826

**DEVELOPMENT AND HORMONE ACTION**

Histidine Kinase Activity of the Ethylene Receptor ETR1 Facilitates the Ethylene Response in Arabidopsis.  
Brenda P. Hall, Samuin N. Shackle, Madhia Amir, Noor Ul Haq, Xiang Qu, and G. Eric Schaller
682

Genetic Evidence for the Reduction of Brassinosteroid Levels by a BAHD Acyltransferase-Like Protein in Arabidopsis.  
Hyungmin Roh, Cheol Woong Jeong, Shozo Fujioka, Youn Kyung Kim, Sookjin Lee, Ji Hoon Ahn, Yang Do Choi, and Jong Seob Lee
696

The Tobacco *BLADE-ON-PETIOLE2* Gene Mediates Differentiation of the Corolla Abscission Zone by Controlling Longitudinal Cell Expansion.  
Xiao-Min Wu, Yi Yu, Li-Bo Han, Chun-Li Li, Hai-Yun Wang, Nai-Qin Zhong, Yuan Yao, and Gui-Xian Xia
835

**ENVIRONMENTAL STRESS AND ADAPTATION TO STRESS**

The Chloroplast Triggers Developmental Reprogramming When MUTS HOMOLOGY1 Is Suppressed in Plants.  
Ying-Zhi Xu, Roberto de la Rosa Santamaria, Kamaldeep S. Virdi, Maria P. Arrieta-Montiel, Fareha Razvi, Shaqing Li, Guadong Ren, Bin Yu, Danny Alexander, Lining Guo, Xuehui Feng, Ismail M. Dweikat, Tom E. Clemente, and Sally A. Mackenzie
710

Zhonghui Tang, Liping Zhang, Chenguang Xu, Shaohua Yuan, Fengting Zhang, Changping Zhao, and Yongliang Zheng
721

DELLA Signaling Mediates Stress-Induced Cell Differentiation in Arabidopsis Leaves through Modulation of Anaphase-Promoting Complex/Cyclosome Activity.  
Hannes Claeyts, Aleksandra Skirycz, Katrien Maleux, and Dirk Inzé
739

**GENETICS, GENOMICS, AND MOLECULAR EVOLUTION**

The Helicase and RNaseIIa Domains of Arabidopsis Dicer-Like1 Modulate Catalytic Parameters during MicroRNA Biogenesis.  
Chenggang Liu, Michael J. Axtell, and Nina V. Fedoroff
748
The $b$ Gene of Pea Encodes a Defective Flavonoid $3',5'$-Hydroxylase, and Confers Pink Flower Color. 
Carol Moreau, Mike J. Ambrose, Lynda Turner, Lionel Hill, T.H. Noel Ellis, and Julie M.I. Hofer

Genetic Analysis of Strawberry Fruit Aroma and Identification of $O$-Methyltransferase FaOMT as the Locus Controlling Natural Variation in Mesifurane Content. 
Yasmin Zorrilla-Fontanesi, Jose-Luis Rambla, Amalia Cabeza, Juan J. Medina, Jose F. Sanchez-Sevilla, Victoriono Valpuesta, Miguel A. Botella, Antonio Granell, and Iraida Amaya

PLANTS INTERACTING WITH OTHER ORGANISMS

NaJZh Regulates a Subset of Defense Responses against Herbivores and Spontaneous Leaf Necrosis in Nicotiana attenuata Plants. 
Youngjoo Oh, Ian T. Baldwin, and Ivan Galis

Mycorrhizal Networks: Common Goods of Plants Shared under Unequal Terms of Trade. 
Florian Walder, Helge Niemann, Mathimaran Natarajan, Moritz F. Lehmann, Thomas Boller, and Andres Wienken

Plasma Membrane Calcium ATPases Are Important Components of Receptor-Mediated Signaling in Plant Immune Responses and Development. 
Nicolas Frei dit Frey, Malick Mbengue, Mark Kwaaitaal, Lisette Nitsch, Denise Allenbach, Heidrun Haecker, Rosa Lozano-Duran, Maria Fransiska Njo, Tom Beeckman, Bruno Huettel, Jan Willem Borst, Ralph Panstruga, and Silke Robatzek

SYSTEMS BIOLOGY, MOLECULAR BIOLOGY, AND GENE REGULATION

Structural and Functional Analysis of VQ Motif-Containing Proteins in Arabidopsis as Interacting Proteins of WRKY Transcription Factors. 
Yuan Cheng, Yuan Zhou, Yan Yang, Ying-Jun Chi, Jie Zhou, Jian-Ye Chen, Fei Wang, Baofang Fan, Kai Shi, Yan-Hong Zhou, Jing-Quan Yu, and Zhixiang Chen

CORRECTIONS

Disruption of Signaling in a Fungal-Grass Symbiosis Leads to Pathogenesis. 
C.J. Eaton, M.P. Cox, B. Ambrose, M. Becker, U. Hesse, C.L. Schardl, and B. Scott

The cover image by Nick Sloff includes an aphid image adapted from a drawing by Thomas Degen (www.thomas-degen.ch) and an image of plant cells adapted from a drawing by Kerry Mauck.