

The electronic form of this issue, available as of February 13, 2006, at [www.plantphysiol.org](http://www.plantphysiol.org), is considered the journal of record.

**On the Cover:** MYB proteins contain a conserved DNA-binding domain (MYB domain) and function as transcription factors playing roles in various physiological, developmental, and biochemical processes. In this issue, Deluc et al. (pp. 499–511) describe the phenotype of tobacco plants overexpressing VvMYB5a, a grapevine protein belonging to a small cluster of MYB transcription factors with no assigned biological functions at this time. The cover picture illustrates only one aspect of the phenotype, a strong accumulation of anthocyanin compounds in flowers and especially in stamens. In addition, VvMYB5a overexpression affects the metabolism of flavonols, proanthocyanidins, and lignins. These findings not only confirm the role of some MYB transcription factors in the control of specific branches of the phenylpropanoid pathway in plants but also suggest the ability for a single MYB protein to impact the whole pathway. Cover image by Laurent Deluc. Image layout by Ash Csikos.

## ON THE INSIDE

*Peter V. Minorsky*

397

## HIGH IMPACT

Variations on a Theme. Regulation of Flowering Time in Arabidopsis. *Aleel K. Grennan*

399

## GENOME ANALYSIS

<sup>[W]</sup>The Rice Mitochondrial Genomes and Their Variations. *Xiangjun Tian, Jing Zheng, Songnian Hu, and Jun Yu*

401

<sup>[W]</sup>Genome-Wide Analysis of the ERF Gene Family in Arabidopsis and Rice. *Toshitsugu Nakano, Kaoru Suzuki, Tatsuhito Fujimura, and Hideaki Shinshi*

411

## RESEARCH ARTICLES

### BIOCHEMICAL PROCESSES AND MACROMOLECULAR STRUCTURES

<sup>[O<sup>A</sup>]</sup>Nickel Deficiency Disrupts Metabolism of Ureides, Amino Acids, and Organic Acids of Young Pecan Foliage. *Cheng Bai, Charles C. Reilly, and Bruce W. Wood*

433

Functional Analysis of the Amine Substrate Specificity Domain of Pepper Tyramine and Serotonin N-Hydroxycinnamoyltransferases. *Sei Kang, Kiyoon Kang, Gap Chae Chung, Doil Choi, Atsushi Ishihara, Dong-Sun Lee, and Kyoungwhan Back*

704

*Continued on next page*

## BIOENERGETICS AND PHOTOSYNTHESIS

- Glutamine Synthetase-Glutamate Synthase Pathway and Glutamate Dehydrogenase Play Distinct Roles in the Sink-Source Nitrogen Cycle in Tobacco. *Céline Masclaux-Daubresse, Michèle Reisdorf-Cren, Karine Pageau, Maud Lelandais, Olivier Grandjean, Joceline Kronenberger, Marie-Hélène Valadier, Magali Feraud, Tiphaine Jouglet, and Akira Suzuki* 444
- Characterization and Cloning of the Chlorophyll-Degrading Enzyme Pheophorbidase from Cotyledons of Radish. *Yasuyo Suzuki, Toyoki Amano, and Yuzo Shioi* 716

## CELL BIOLOGY AND SIGNAL TRANSDUCTION

- RED AND FAR-RED INSENSITIVE 2, a RING-Domain Zinc Finger Protein, Mediates Phytochrome-Controlled Seedling Deetiolation Responses. *Mingjie Chen and Min Ni* 457
- <sup>[W]</sup>Functional Characterization of Sequence Motifs in the Transit Peptide of Arabidopsis Small Subunit of Rubisco. *Dong Wook Lee, Sookjin Lee, Gil-je Lee, Kwang Hee Lee, Sanguk Kim, Gang-Won Cheong, and Inhwan Hwang* 466
- <sup>[W]</sup>Global Patterns of Gene Expression in the Aleurone of Wild-Type and *dwarf1* Mutant Rice. *Paul C. Bethke, Yong-sic Hwang, Tong Zhu, and Russell L. Jones* 484
- <sup>[W]</sup>Characterization of a Grapevine R2R3-MYB Transcription Factor That Regulates the Phenylpropanoid Pathway. *Laurent Deluc, François Barrieu, Chloé Marchive, Virginie Lauvergeat, Alain Decendit, Tristan Richard, Jean-Pierre Carde, Jean-Michel Mérillon, and Saïd Hamdi* 499
- The Fertilization-Induced DNA Replication Factor MCM6 of Maize Shuttles between Cytoplasm and Nucleus, and Is Essential for Plant Growth and Development. *Thomas Dresselhaus, Kanok-orn Srilunchang, Dunja Leljak-Levanić, Daniela N. Schreiber, and Preeti Garg* 512
- <sup>[W][OA]</sup>Evidence for Functional Conservation, Sufficiency, and Proteolytic Processing of the CLAVATA3 CLE Domain. *Jun Ni and Steven E. Clark* 726
- <sup>[W]</sup>Proteomics of Rac GTPase Signaling Reveals Its Predominant Role in Elicitor-Induced Defense Response of Cultured Rice Cells. *Masayuki Fujiwara, Kenji Umemura, Tsutomu Kawasaki, and Ko Shimamoto* 734
- <sup>[W]</sup>A Universal Role for Inositol 1,4,5-Trisphosphate-Mediated Signaling in Plant Gravitropism. *Imara Y. Perera, Chiu-Yueh Hung, Shari Brady, Gloria K. Muday, and Wendy F. Boss* 746

## DEVELOPMENT AND HORMONE ACTION

- Ectopic Expression of Pumpkin Gibberellin Oxidases Alters Gibberellin Biosynthesis and Development of Transgenic Arabidopsis Plants. *Abeer Radi, Theo Lange, Tomoya Niki, Masaji Koshioka, and Maria João Pimenta Lange* 528
- The Grapevine *fleshless berry* Mutation. A Unique Genotype to Investigate Differences between Fleshy and Nonfleshy Fruit. *Lucie Fernandez, Charles Romieu, Annick Moing, Alain Bouquet, Mickael Maucourt, Mark R. Thomas, and Laurent Torregrosa* 537

The Regulation of *DWARF4* Expression Is Likely a Critical Mechanism in Maintaining the Homeostasis of Bioactive Brassinosteroids in Arabidopsis. *Ho Bang Kim, Mi Kwon, Hojin Ryu, Shozo Fujioka, Suguru Takatsuto, Shigeo Yoshida, Chung Sun An, Ilha Lee, Ildoo Hwang, and Sunghwa Choe* 548

[W]Abscisic Acid Stimulates a Calcium-Dependent Protein Kinase in Grape Berry. *Xiang-Chun Yu, Mei-Jun Li, Gui-Feng Gao, Hai-Zhong Feng, Xue-Qing Geng, Chang-Cao Peng, Sai-Yong Zhu, Xiao-Jing Wang, Yuan-Yue Shen, and Da-Peng Zhang* 558

The Role of *OsBRI1* and Its Homologous Genes, *OsBRL1* and *OsBRL3*, in Rice. *Ayako Nakamura, Shozo Fujioka, Hidehiko Sunohara, Noriko Kamiya, Zhi Hong, Yoshiaki Inukai, Kotaro Miura, Suguru Takatsuto, Shigeo Yoshida, Miyako Ueguchi-Tanaka, Yasuko Hasegawa, Hidemi Kitano, and Makoto Matsuoka* 580

A Novel Plant-Specific Family Gene, *ROOT PRIMORDIUM DEFECTIVE 1*, Is Required for the Maintenance of Active Cell Proliferation. *Mineko Konishi and Munetaka Sugiyama* 591

## ENVIRONMENTAL STRESS AND ADAPTATION TO STRESS

Progressive Inhibition by Water Deficit of Cell Wall Extensibility and Growth along the Elongation Zone of Maize Roots Is Related to Increased Lignin Metabolism and Progressive Stelar Accumulation of Wall Phenolics. *Ling Fan, Raphael Linker, Shimon Gepstein, Eiichi Tanimoto, Ryoichi Yamamoto, and Peter M. Neumann* 603

Transgenic Tobacco Overexpressing Glyoxalase Pathway Enzymes Grow and Set Viable Seeds in Zinc-Spiked Soils. *Sneh L. Singla-Pareek, Sudesh K. Yadav, Ashwani Pareek, M.K. Reddy, and S.K. Sopory* 613

Double Knockouts of Phospholipases *Dg1* and *Dg2* in Arabidopsis Affect Root Elongation during Phosphate-Limited Growth But Do Not Affect Root Hair Patterning. *Maoyin Li, Chunbo Qin, Ruth Welti, and Xuemin Wang* 761

## GENETICS, GENOMICS, AND MOLECULAR EVOLUTION

[W][OA]Molecular Characterization and Phylogeny of U2AF<sup>35</sup> Homologs in Plants. *Bing-Bing Wang and Volker Brendel* 624

[W]Sucrose-Specific Induction of the Anthocyanin Biosynthetic Pathway in Arabidopsis. *Cinzia Solfanelli, Alessandra Poggi, Elena Loreti, Amedeo Alpi, and Pierdomenico Perata* 637

Exposed Loop Domains of Complexed 14-3-3 Proteins Contribute to Structural Diversity and Functional Specificity. *Paul C. Sehnke, Beth Laughner, Helene Cardasis, David Powell, and Robert J. Ferl* 647

## PLANTS INTERACTING WITH OTHER ORGANISMS

[W]Architecture of Infection Thread Networks in Developing Root Nodules Induced by the Symbiotic Bacterium *Sinorhizobium meliloti* on *Medicago truncatula*. *Hannah Monahan-Giovanelli, Catalina Arango Pinedo, and Daniel J. Gage* 661

[W][OA]Nitrogen Fixation Mutants of *Medicago truncatula* Fail to Support Plant and Bacterial Symbiotic Gene Expression. *Colby G. Starker, Adriana L. Parra-Colmenares, Lucinda Smith, Raka M. Mitra, and Sharon R. Long* 671

Rewiring Mitogen-Activated Protein Kinase Cascade by Positive Feedback Confers Potato Blight Resistance. *Chihiro Yamamizo, Kazuo Kuchimura, Akira Kobayashi, Shinpei Katou, Kazuhito Kawakita, Jonathan D.G. Jones, Noriyuki Doke, and Hirofumi Yoshioka* 681

## WHOLE PLANT AND ECOPHYSIOLOGY

Evidence for Involvement of Photosynthetic Processes in the Stomatal Response to CO<sub>2</sub>. *Susanna M. Messinger, Thomas N. Buckley, and Keith A. Mott* 771

<sup>[O<sup>A</sup>]</sup>Photosynthesis, Productivity, and Yield of Maize Are Not Affected by Open-Air Elevation of CO<sub>2</sub> Concentration in the Absence of Drought. *Andrew D.B. Leakey, Martin Uribeharrea, Elizabeth A. Ainsworth, Shawna L. Naidu, Alistair Rogers, Donald R. Ort, and Stephen P. Long* 779

## SYSTEMS BIOLOGY, MOLECULAR BIOLOGY, AND GENE REGULATION

Mitosis-Specific Promoter of the Alfalfa Cyclin-Dependent Kinase Gene (*Medsa;CDKB2;1*) Is Activated by Wounding and Ethylene in a Non-Cell Division-Dependent Manner. *Miroslava K. Zhiponova, Aladár Pettkó-Szandtner, Éva Stelkovic, Zsuzsanna Neer, Sándor Bottka, Tibor Krenács, Dénes Dudits, Attila Fehér, and László Szilák* 693

<sup>[W]</sup> Indicates Web-only data.

<sup>[O<sup>A</sup>]</sup> Open Access articles can be viewed online without a subscription.