ON THE COVER

The rich variety of flower colors in plants in large part is due to the presence of anthocyanins, in particular, their modification with glycosyl and acyl moieties giving rise to a panoply of molecular variants with different color properties. Matsuba et al. (pages 3374–3389) show that glucosylation of anthocyanin at the 5/7 position in the petals of carnation (*Dianthus caryophyllus*) and delphinium (*Delphinium grandiflorum*) is carried out in an unusual fashion involving aromatic acyl-glucoses as sugar donors. The enzymes catalyzing this reaction were identified as acyl-glucose-dependent glucosyltransferases belonging to the glycoside hydrolase 1 family. Phylogenetic analysis reveals that other plant species are likely to have similar acyl-glucose-dependent glucosyltransferases, suggesting that these enzymes may contribute to generating variation in anthocyanins, and thus flower color, in a variety of species.

---

IN BRIEF

Cytokinin and Compound Leaf Development
Gregory Bertoni

Introducing Aromatic Amino Acid Hydroxylases from Plants
Kathleen L. Farquharson

RESEARCH ARTICLES

Arachidonic Acid: An Evolutionarily Conserved Signaling Molecule Modulates Plant Stress Signaling Networks
Tatyana Savchenko, Justin W. Walley, E. Wassim Chehab, Yanmei Xiao, Roy Kaspi, Matthew F. Pye, Maged E. Mohamed, Colin M. Lazarus, Richard M. Bostock, and Katayoon Dehesh

Cytokinin Regulates Compound Leaf Development in Tomato
Eilon Shani, Hadas Ben-Gera, Sharona Shleizer-Burko, Yogevo Burko, David Weiss, and Naomi Ori

The Arabidopsis Dynamin-Related Protein2 Family Is Essential for Gametophyte Development
Steven K. Backues, David A. Korasick, Antje Heese, and Sebastian Y. Bednarek

Arabidopsis SET DOMAIN GROUP2 Is Required for H3K4 Trimethylation and Is Crucial for Both Sporophyte and Gametophyte Development
Alexandre Berre, Emily J. McCallum, Rozenn Ménard, Denise Meyer, Jörg Fuchs, Aiwu Dong, and Wen-Hui Shen

Inactivation of a DNA Methylation Pathway in Maize Reproductive Organs Results in Apomixis-Like Phenotypes
Marcelina Garcia-Aguilar, Caroline Michaud, Olivier Leblanc, and Daniel Grimanelli

Mitochondrial β-Cyanoalanine Synthase Is Essential for Root Hair Formation in Arabidopsis thaliana
Irene García, José María Castellano, Blanca Vioque, Roberto Solano, Cecilia Gotor, and Luis C. Romero
A Novel Factor FLOURY ENDOSPERM2 Is Involved in Regulation of Rice Grain Size and Starch Quality

Kao-Chih She, Hiroaki Kusano, Kazuyoshi Koizumi, Hiromoto Yamakawa, Makoto Hakata, Tomohiro Imamura, Masato Fukuda, Natsuka Naito, Yurii Tsurumaki, Mitsuiho Yaeshima, Tomohiko Tsuge, Ken Matsunomo, Mari Kudoh, Eiko Itoh, Shosshiki Kimura, Naoki Kishimoto, Junshi Yazaki, Tsuyu Ando, Masahiro Yanou, Takashi Aoyama, Tadamaasa Sasaki, Hikaru Satoh, and Hiroaki Shimada

The ER-Localized TWD1 Immunophilin Is Necessary for Localization of Multidrug Resistance-Like Proteins Required for Polar Auxin Transport in Arabidopsis Roots

Guosheng Wu, Marisa S. Otegui, and Edgar P. Spalding

A Maize Thiamine Auxotroph Is Defective in Shoot Meristem Maintenance

John B. Woodward, N. Dinuka Abeydeera, Debamita Paul, Kimberly Phillips, Maria Rapala-Kozik, Michael Freeling, Tadhg P. Begley, Steven E. Ealick, Paula McStein, and Michael J. Scanlon

RAD5A, RECQ4A, and MUS81 Have Specific Functions in Homologous Recombination and Define Different Pathways of DNA Repair in Arabidopsis thaliana

Anja Mannuss, Stefanie Dukowic-Schulze, Stefanie Suer, Frank Hartung, Michael Pacher, and Holger Puchta

Regulation of the Chlamydomonas Cell Cycle by a Stable, Chromatin-Associated Retinoblastoma Tumor Suppressor Complex

Bradley J.S.C. Olson, Michael Oberholzer, Yubing Li, James M. Zones, Harjivan S. Kohli, Katerina Bisova, Su-Chiung Fang, Jill Meisenhelder, Tony Hunter, and James G. Umen

Provitamin A Accumulation in Cassava (Manihot esculenta) Roots Driven by a Single Nucleotide Polymorphism in a Phytoene Synthase Gene

Ralf Welsch, Jacobo Arango, Cornelia Bär, Bertha Salazar, Salim Al-Babili, Jesús Beltrán, Paul Chavarriaga, Hernan Ceballos, Joe Tohme, and Peter Beyer

Functional Analyses of Caffeic Acid O-Methyltransferase and Cinnamoyl-CoA-Reductase Genes from Perennial Ryegrass (Lolium perenne)

Yi Tu, Simone Rochfort, Zhiqian Liu, Yidong Ran, Megan Griffith, Pieter Badenhorst, Gordon V. Louie, Marianne E. Bowman, Kevin F. Smith, Joseph P. Noel, Aidyn Mouradov, and German Spangenberg

A Novel Glucosylation Reaction on Anthocyanins Catalyzed by Acyl-Glucose–Dependent Glucosyltransferase in the Petals of Carnation and Delphinium

Yuki Matsuba, Nobuhiro Sasako, Masayuki Tera, Masachika Okamura, Yutaka Abe, Emi Okamoto, Haruka Nakamura, Hisakage Funabashi, Makoto Takatsu, Mikako Saito, Hideaki Matsuoka, Kazuo Nagasawa, and Yoshihiro Ozeki

Clustered Transcription Factor Genes Regulate Nicotine Biosynthesis in Tobacco

Tsubasa Shoji, Masataka Kajikawa, and Takashi Hashimoto

Nonflowering Plants Possess a Unique Folate-Dependent Phenylalanine Hydroxylase That Is Localized in Chloroplasts

Anne Pribat, Alexandre Noirel, Alison M. Morse, John M. Davis, Romain Fouquet, Karen Loizeau, Stéphane Ravanet, Wolfgang Frank, Richard Haas, Ralf Reski, Mohamed Bedair, Lloyd W. Sumner, and Andrew D. Hanson
The Cytoskeleton and the Peroxisomal-Targeted SNOWY COTYLEDON3 Protein Are Required for Chloroplast Development in Arabidopsis

Verónica Albrecht, Klára Šimková, Chris Carrie, Etienne Delannoy, Estelle Giraud, Jim Whelan, Ian David Small, Klaus Apel, Murray R. Badger, and Barry James Pogson

The Arabidopsis Thylakoid Protein PAM68 Is Required for Efficient D1 Biogenesis and Photosystem II Assembly

Ute Armbuster, Jessica Zühike, Birgit Rengstl, Renate Kräller, Elina Makarenko, Thilo Rühle, Danja Schünemann, Peter Jahns, Bernd Weisshaar, Jörg Nickelsen, and Dario Leister

Arabidopsis VASCULAR-RELATED NAC-DOMAIN6 Directly Regulates the Genes That Govern Programmed Cell Death and Secondary Wall Formation during Xylem Differentiation

Kyoko Ohashi-Ito, Yoshihisa Oda, and Hiroo Fukuda

The Medicago truncatula E3 Ubiquitin Ligase PUB1 Interacts with the LYK3 Symbiotic Receptor and Negatively Regulates Infection and Nodulation

Malick Mbengue, Sylvie Camut, Fernanda de Carvalho-Niebel, Laurent Deslandes, Solène Froidure, Dörte Klaus-Heisen, Sandra Moreau, Susana Rivas, Ton Timmers, Christine Hervé, Julie Cullimore, and Benoit Lefebvre

Norcoclaurine Synthase Is a Member of the Pathogenesis-Related 10/Bet v1 Protein Family

Eun-Jeong Lee and Peter Facchini

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.