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On the Cover: Export of proteins from the endoplasmic reticulum (ER) to the Golgi apparatus is an essential process to the life of a cell. Protein export from the ER is dependent on the localized polymerization of protein machinery called COPII that shapes the ER membrane into transport carriers. The COPII machinery operates at specialized ER subdomains—the ER export sites (ERES). By combining biochemical and live cell-imaging techniques, Hanton et al. (pp. 1640–1650) demonstrate that in plants the assembly of COPII coat proteins is not a constitutive feature of ERES. In particular, they show that COPII activity at ERES responds to the plant cell's need to secrete by recruiting COPII coat to ERES and by differentiating new ERES. The cover image shows the distribution of the known fluorescent ERES marker YFP-Sec24 (magenta) and ER/Golgi marker ERD2-GFP (green). In the overlaid image, it is possible to see that the Sec24-ERES structures are distributed at the peri-Golgi area in Arabidopsis leaves. This distribution is similar to that in tobacco leaves. Images were produced by Loren A. Matheson, assisted by Marlene Cameron.

ON THE INSIDE

Peter V. Minorsky

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GENOME ANALYSIS

^{[W][OA]}Assessing the Efficiency of RNA Interference for Maize Functional Genomics. *Karen McGinnis, Nick Murphy, Alvar R. Carlson, Anisha Akula, Chakradhar Akula, Heather Basinger, Michelle Carlson, Peter Hermanson, Nives Kovacevic, M. Annie McGill, Vishwas Seshadri, Jessica Yoyokie, Karen Cone, Heidi F. Kaeppler, Shawn M. Kaeppler, and Nathan M. Springer*

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^{[C][W][OA]}PlanTAPDB, a Phylogeny-Based Resource of Plant Transcription-Associated Proteins. *Sandra Richardt, Daniel Lang, Ralf Reski, Wolfgang Frank, and Stefan A. Rensing*

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^{[W][OA]}F-Box Proteins in Rice. Genome-Wide Analysis, Classification, Temporal and Spatial Gene Expression during Panicle and Seed Development, and Regulation by Light and Abiotic Stress. *Mukesh Jain, Aashima Nijhawan, Rita Arora, Pinky Agarwal, Swatishmita Ray, Pooja Sharma, Sanjay Kapoor, Akhilesh K. Tyagi, and Jitendra P. Khurana*

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RESEARCH ARTICLES

BIOCHEMICAL PROCESSES AND MACROMOLECULAR STRUCTURES

^{[W][OA]}Molecular Modeling and Site-Directed Mutagenesis Reveal the Benzylisoquinoline Binding Site of the Short-Chain Dehydrogenase/Reductase Salutaridine Reductase. *René Geissler, Wolfgang Brandt, and Jörg Ziegler*

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^[OA]The Structure of Eukaryotic Translation Initiation Factor-4E from Wheat Reveals a Novel Disulfide Bond. *Arthur F. Monzingo, Simrit Dhaliwal, Anirvan Dutt-Chaudhuri, Angeline Lyon, Jennifer H. Sadow, David W. Hoffman, Jon D. Robertus, and Karen S. Browning*

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- ^{[CI][WIOA]}Characterization of the Regulatory and Expression Context of an Alternative Oxidase Gene Provides Insights into Cyanide-Insensitive Respiration during Growth and Development. *Lois H.M. Ho, Estelle Giraud, Ryan Lister, David Thirkettle-Watts, Jasmine Low, Rachel Clifton, Katharine A. Howell, Chris Carrie, Tamzin Donald, and James Whelan* 1519
- ^[WIOA]Mitochondrial Complex II Is Essential for Gametophyte Development in Arabidopsis. *Gabriel León, Loreto Holuigue, and Xavier Jordana* 1534
- ^[OA]REP27, a Tetratricopeptide Repeat Nuclear-Encoded and Chloroplast-Localized Protein, Functions in D1/32-kD Reaction Center Protein Turnover and Photosystem II Repair from Photodamage. *Sungsoon Park, Phichaya Khamai, Jose Gines Garcia-Cerdan, and Anastasios Melis* 1547
- The Transiently Generated Nonphotochemical Quenching of Excitation Energy in Arabidopsis Leaves Is Modulated by Zeaxanthin. *Ljudmila Kalituhov, Karl Christian Beran, and Peter Jahns* 1861

CELL BIOLOGY AND SIGNAL TRANSDUCTION

- ^[OA]EpsinR2 Interacts with Clathrin, Adaptor Protein-3, AtVTI12, and Phosphatidylinositol-3-Phosphate. Implications for EpsinR2 Function in Protein Trafficking in Plant Cells. *Gil-Je Lee, Hyeran Kim, Hyangju Kang, Mihue Jang, Dong Wook Lee, Sookjin Lee, and Inhwan Hwang* 1561
- ^[OA]An Early Nodulin-Like Protein Accumulates in the Sieve Element Plasma Membrane of Arabidopsis. *Junaid A. Khan, Qi Wang, Richard D. Sjölund, Alexander Schulz, and Gary A. Thompson* 1576
- ^[WIOA]The GCR1, GPA1, PRN1, NF-Y Signal Chain Mediates Both Blue Light and Abscisic Acid Responses in Arabidopsis. *Katherine M. Warpeha, Snehal Upadhyay, Jennifer Yeh, Julia Adamiak, Samuel I. Hawkins, Yevgeniya R. Lapik, Mary Beth Anderson, and Lon S. Kaufman* 1590
- ^{[CI][OA]}Overexpression of Arabidopsis AGD7 Causes Relocation of Golgi-Localized Proteins to the Endoplasmic Reticulum and Inhibits Protein Trafficking in Plant Cells. *Myung Ki Min, Soo Jin Kim, Yansong Miao, Juyoun Shin, Liwen Jiang, and Inhwan Hwang* 1601
- ^[WIOA]Multiple Roles of ADP-Ribosylation Factor 1 in Plant Cells Include Spatially Regulated Recruitment of Coatamer and Elements of the Golgi Matrix. *Loren A. Matheson, Sally L. Hanton, Marika Rossi, Maita Latijnhouwers, Giovanni Stefano, Luciana Renna, and Federica Brandizzi* 1615
- ^[WIOA]Protein Mobilization in Germinating Mung Bean Seeds Involves Vacuolar Sorting Receptors and Multivesicular Bodies. *Junqi Wang, Yubing Li, Sze Wan Lo, Stefan Hillmer, Samuel S.M. Sun, David G. Robinson, and Liwen Jiang* 1628
- ^[WIOA]De Novo Formation of Plant Endoplasmic Reticulum Export Sites Is Membrane Cargo Induced and Signal Mediated. *Sally L. Hanton, Laurent Chatre, Luciana Renna, Loren A. Matheson, and Federica Brandizzi* 1640
- ^{[CI][WIOA]}Regulation of NH₄⁺ Transport by Essential Cross Talk between AMT Monomers through the Carboxyl Tails. *Benjamin Neuhäuser, Marek Dynowski, Maria Mayer, and Uwe Ludwig* 1651
- ^{[CI][W]}Overexpression of Pectin Methyltransferase Inhibitors in Arabidopsis Restricts Fungal Infection by *Botrytis cinerea*. *Vincenzo Lionetti, Alessandro Raiola, Laura Camardella, Alfonso Giovane, Nicolai Obel, Markus Pauly, Francesco Favaron, Felice Cervone, and Daniela Bellincampi* 1871
- ^[WIOA]Functional Genomic Analysis Supports Conservation of Function Among Cellulose Synthase-Like A Gene Family Members and Suggests Diverse Roles of Mannans in Plants. *Aaron H. Liepman, C. Joseph Nairn, William G.T. Willats, Iben Sørensen, Alison W. Roberts, and Kenneth Keegstra* 1881

DEVELOPMENT AND HORMONE ACTION

- ^[WIOA]Involvement of the Histone Acetyltransferase AtHAC1 in the Regulation of Flowering Time via Repression of *FLOWERING LOCUS C* in Arabidopsis. *WeiWei Deng, ChunYan Liu, YanXi Pei, Xian Deng, LiFang Niu, and XiaoFeng Cao* 1660
- ^[WIOA]Gene Expression Profiling Reveals Defined Functions of the ATP-Binding Cassette Transporter *COMATOSE* Late in Phase II of Germination. *Esther Carrera, Tara Holman, Anne Medhurst, Wendy Peer, Heike Schmutz, Steven Footitt, Frederica L. Theodoulou, and Michael J. Holdsworth* 1669

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- [W][OA] Roles of Brassinosteroids and Related mRNAs in Pea Seed Growth and Germination. *Takahito Nomura, Masaaki Ueno, Yumiko Yamada, Suguru Takatsuto, Yasutomo Takeuchi, and Takao Yokota* 1680
- [OA] Auxin Synthesis-Encoding Transgene Enhances Grape Fecundity. *Elisa Costantini, Lucia Landi, Oriana Silvestroni, Tiziana Pandolfini, Angelo Spena, and Bruno Mezzetti* 1689
- Actin Is Involved in Auxin-Dependent Patterning. *Jan Maisch and Peter Nick* 1695
- [W][OA] Characterization of Two Brassinosteroid C-6 Oxidase Genes in Pea. *Corinne E. Jager, Gregory M. Symons, Takahito Nomura, Yumiko Yamada, Jennifer J. Smith, Shinjiro Yamaguchi, Yuji Kamiya, James L. Weller, Takao Yokota, and James B. Reid* 1894

ENVIRONMENTAL STRESS AND ADAPTATION TO STRESS

- [C][W][OA] A Novel Major Facilitator Superfamily Protein at the Tonoplast Influences Zinc Tolerance and Accumulation in Arabidopsis. *Michael J. Haydon and Christopher S. Cobbett* 1705
- [W][OA] Specific Roles of α - and γ -Tocopherol in Abiotic Stress Responses of Transgenic Tobacco. *Ali-Reza Abbasi, Mohamad Hajirezaei, Daniel Hofius, Uwe Sonnwald, and Lars M. Voll* 1720
- [C][W][OA] Overexpression of an R1R2R3 MYB Gene, OsMYB3R-2, Increases Tolerance to Freezing, Drought, and Salt Stress in Transgenic Arabidopsis. *Xiaoyan Dai, Yunyuan Xu, Qibin Ma, Wenying Xu, Tai Wang, Yongbiao Xue, and Kang Chong* 1739
- [OA] Adenine Nucleotide Pool Perturbation Is a Metabolic Trigger for AMP Deaminase Inhibitor-Based Herbicide Toxicity. *Richard L. Sabina, Anna-Lisa Paul, Robert J. Ferl, Bernd Laber, and Stephen D. Lindell* 1752
- [OA] Iron Acquisition by Phytosiderophores Contributes to Cadmium Tolerance. *Anderson R. Meda, Enrico B. Scheuermann, Ulrich E. Prechsl, Bülent Erenoglu, Gabriel Schaaf, Heiko Hayen, Günther Weber, and Nicolaus von Wirén* 1761
- [W][OA] The *redox imbalanced* Mutants of Arabidopsis Differentiate Signaling Pathways for Redox Regulation of Chloroplast Antioxidant Enzymes. *Isabelle Heiber, Elke Ströher, Bodo Raatz, Ingo Busse, Uwe Kahmann, Mike W. Bevan, Karl-Josef Dietz, and Margarete Baier* 1774
- [C][W][OA] WRKY75 Transcription Factor Is a Modulator of Phosphate Acquisition and Root Development in Arabidopsis. *Ballachanda N. Devaiah, Athikkattuvalasu S. Karthikeyan, and Kashchandra G. Raghothama* 1789
- [OA] Overproduction of Abscisic Acid in Tomato Increases Transpiration Efficiency and Root Hydraulic Conductivity and Influences Leaf Expansion. *Andrew J. Thompson, John Andrews, Barry J. Mulholland, John M.T. McKee, Howard W. Hilton, Jon S. Horridge, Graham D. Farquhar, Rachel C. Smeeton, Ian R.A. Smillie, Colin R. Black, and Ian B. Taylor* 1905
- [OA] HKT1;5-Like Cation Transporters Linked to Na⁺ Exclusion Loci in Wheat, *Nax2* and *Kna1*. *Caitlin S. Byrt, J. Damien Platten, Wolfgang Spielmeier, Richard A. James, Evans S. Lagudah, Elizabeth S. Dennis, Mark Tester, and Rana Munns* 1918
- An Unusual Posttranscriptional Processing in Two *Betaine Aldehyde Dehydrogenase* Loci of Cereal Crops Directed by Short, Direct Repeats in Response to Stress Conditions. *Xiangli Niu, Wenjing Zheng, Bao-Rong Lu, Guangjun Ren, Weizao Huang, Songhu Wang, Junli Liu, Zizhi Tang, Di Luo, Yuguang Wang, and Yongsheng Liu* 1929

GENETICS, GENOMICS, AND MOLECULAR EVOLUTION

- [OA] Tracing the Evolution of the Light-Harvesting Antennae in Chlorophyll *a/b*-Containing Organisms. *Adam G. Koziol, Tudor Borza, Ken-Ichiro Ishida, Patrick Keeling, Robert W. Lee, and Dion G. Durnford* 1802
- Candidate Genes and Quantitative Trait Loci Affecting Fruit Ascorbic Acid Content in Three Tomato Populations. *Rebecca Stevens, Michel Buret, Philippe Duffé, Cécile Garchery, Pierre Baldet, Christophe Rothan, and Mathilde Causse* 1943

PLANTS INTERACTING WITH OTHER ORGANISMS

- [W][OA] Diverse Subcellular Locations of Cryptogein-Induced Reactive Oxygen Species Production in Tobacco Bright Yellow-2 Cells. *Cher Ashtamker, Vladimir Kiss, Moshe Sagi, Olga Davydov, and Robert Fluhr* 1817

- ^[W]Regulation of Arbuscular Mycorrhization by Carbon. The Symbiotic Interaction Cannot Be Improved by Increased Carbon Availability Accomplished by Root-Specifically Enhanced Invertase Activity. *Sara Schaarschmidt, Mari-Cruz González, Thomas Roitsch, Dieter Strack, Uwe Sonnewald, and Bettina Hause* 1827
- ^[C]^[W]^[OA]Stability of Plant Defense Proteins in the Gut of Insect Herbivores. *Hui Chen, Eliana Gonzales-Vigil, Curtis G. Wilkerson, and Gregg A. Howe* 1954
- ^[OA]Nitrogen Fixation Control under Drought Stress. Localized or Systemic? *Daniel Marino, Pierre Frendo, Ruben Ladrera, Ana Zabalza, Alain Puppo, Cesar Arrese-Igor, and Esther M. González* 1968

WHOLE PLANT AND ECOPHYSIOLOGY

- ^[W]^[OA]Cytokinin Import Rate as a Signal for Photosynthetic Acclimation to Canopy Light Gradients. *Alex Boonman, Els Prinsen, Frank Gilmer, Ulrich Schurr, Anton J.M. Peeters, Laurentius A.C.J. Voeselek, and Thijs L. Pons* 1841
- ^[W]Comprehensive Screening of Arabidopsis Mutants Suggests the Lysine Histidine Transporter 1 to Be Involved in Plant Uptake of Amino Acids. *Henrik Soenmerstam, Ulrika Ganeteg, Catherine Bellini, and Torgny Näsholm* 1853
- Reduced Content of Homogalacturonan Does Not Alter the Ion-Mediated Increase in Xylem Hydraulic Conductivity in Tobacco. *Andrea Nardini, Antonio Gascó, Felice Cervone, and Sebastiano Salleo* 1975

CORRECTIONS

- Transcriptional Profiling of the Arabidopsis Embryo. *M.W.B. Spencer, S.A. Casson, and K. Lindsey* 1982
- A coumaroyl-ester-3-hydroxylase* Insertion Mutant Reveals the Existence of Nonredundant *meta*-Hydroxylation Pathways and Essential Roles for Phenolic Precursors in Cell Expansion and Plant Growth. *N. Abdulrazzak, B. Pollet, J. Ehltling, K. Larsen, C. Asnaghi, S. Ronseau, C. Proux, M. Erhardt, V. Seltzer, J.-P. Renou, P. Ullmann, M. Pauly, C. Lapiere, and D. Werck-Reichhart* 1982

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^[W] Indicates Web-only data.

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