On the Cover: The composite image shows the submergence response found in flood-tolerant Rumex spp. and a ribbon model of the receiver domain from the ETHYLENE RESPONSE1 (ETR1) ethylene receptor of Arabidopsis (Arabidopsis thaliana). Rumex spp. escape from submerged conditions by fast elongation of petioles. This cell elongation process is initiated by the accumulation of ethylene inside the submerged plant tissues, related to the slow diffusion of gases in water. Subsequently, other plant hormones, along with regulators of photomorphogenesis, mediate this growth response, leading to the stimulation of target processes such as cell wall loosening. After the leaf tips emerge into the atmosphere, oxygen can diffuse into the plant to ensure survival. In the ribbon model of the ETR1 receiver domain, amino acids that are important for various traits described by Bakshi et al. (pp. 219–232) are shown in space-filling structures. Mutation of three amino acid residues (gray carbons) results in a receptor that cannot stimulate nutational bending in response to ethylene. Mutation of two residues in the γ loop (white carbons) results in a receptor that inhibits germination on salt more effectively than wild-type ETR1, whereas mutation of two residues just prior to the γ loop (black carbons) results in a receptor that cannot inhibit germination on salt. The model of the ETR1 receiver domain was generated by Molecular Operating Environment (version 2012.10) based on the receiver domain crystal structure (Protein Data Bank 1DCF). Cover image credits: Ole Pedersen, Freshwater Biological Laboratory, University of Copenhagen (Rumex spp. submergence response); and Brad M. Binder, Department of Biochemistry, Cellular, and Molecular Biology, University of Tennessee, Knoxville (ETR1 receiver domain). Cover layout by Diane McCauley.

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A transcription factor regulates trehalase expression and induces a carbon starvation transcriptome and metabolome.

[OPEN] TRANSPARENT TESTA GLABRA1 Regulates the Accumulation of Seed Storage Reserves in Arabidopsis. Mingxun Chen, Bin Zhang, Chengxiang Li, Harikrishna Kalaveerasingam, Fook Tim Chew, and Hao Yu

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[OPEN] MUCILAGE-RELATED10 Produces Galactoglucomannan That Maintains Pectin and Cellulose Architecture in Arabidopsis Seed Mucilage. Cătălin Voiniciuc, Maximilian Heinrich-Wilhelm Schmidt, Adeline Berger, Bo Yang, Berit Ebert, Henrik V. Scheller, Helen M. North, Björn Usadel, and Markus Günl

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A Single Amino Acid Substitution in an ORANGE Protein Promotes Carotenoid Overaccumulation in Arabidopsis. Hui Yuan, Katherine Owsiany, T.E. Sheeja, Xiangjun Zhou, Caroline Rodriguez, Yongxi Li, Ralf Welsch, Noam Chayut, Yong Yang, Theodore W. Thanhauser, Mandayam V. Parthasarathy, Qiang Xu, Xiaxin Deng, Zhangjun Fei, Ari Schaffer, Nurit Katzir, Joseph Burger, Yaakov Tadmor, and Li Li

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Bioinformatics Reveal Five Lineages of Oleosins and the Mechanism of Lineage Evolution Related to Structure/Function from Green Algae to Seed Plants. Ming-Der Huang and Anthony H.C. Huang

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A Critical Role of Lyst-Interacting Protein5, a Positive Regulator of Multivesicular Body Biogenesis, in Plant Responses to Heat and Salt Stresses. Fei Wang, Yan Yang, Zhe Wang, Jie Zhou, Baofang Fan, and Zhixiang Chen

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Auxin regulates a progressive cell cycle during adult maize lateral root formation.

An Antarctic alga exhibits differential phosphorylation of thylakoid membrane proteins, which are part of a photosystem I supercomplex involved in cyclic electron flow.

For photoprotection in cyanobacteria, the N-terminal arm of the orange carotenoid protein is important for both the regulation of its photoactivation and its interaction with the phycobilisome antenna.

Mutations in vacuolar iron transporters modify both tissue specific and subcellular localization of seed iron stores.

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A cytoplasmic calcineurin-like-dependent protein kinase affects salt and osmotic stress responses by preferentially localizing to the vacuolar membrane under stress.

Pseudomonas syringae Effector Avirulence Protein E Localizes to the Host Plasma Membrane and Down-Regulates the Expression of the NONRACE-SPECIFIC DISEASE RESISTANCE1/HARPIN-INDUCED1-LIKE13 Gene Required for Antibacterial Immunity in Arabidopsis. Xiu-Fang Xin, Kinya Nomura, Xinhua Ding, Xujun Chen, Kun Wang, Kyaw Aung, Francisco Uribe, Bruce Rosa, Jian Yao, Jin Chen, and Sheng Yang He

A major plant plasma membrane-targeted bacterial virulence protein is linked to reduced expression of an Arabidopsis gene required for innate immunity.


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A Constitutively Active Allele of Phytochrome B Maintains Circadian Robustness in the Absence of Light. Matthew Alan Jones, Wei Hu, Suzanne Litthauer, J. Clark Lagarias, and Stacey Lynn Harner

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The Responses of Arabidopsis Early Light-Induced Protein2 to Ultraviolet B, High Light, and Cold Stress Are Regulated by a Transcriptional Regulatory Unit Composed of Two Elements. Natsuki Hayami, Yusaku Sakai, Mitsuhiro Kimura, Tatsunori Saito, Mutsuotomo Tokizawa, Satoshi Iuchi, Yukio Kurihara, Minami Matsui, Mika Nomoto, Yasuomi Tada, and Yoshiharu Y. Yamamoto

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The Arabidopsis Mediator Complex Subunit16 Is a Key Component of Basal Resistance against the Necrotrophic Fungal Pathogen Sclerotinia sclerotiorum. Chenggang Wang, Jin Yao, Xuezhu Du, Yanping Zhang, Yijun Sun, Jeffrey A. Rollins, and Zhonglin Mou

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Development of the Poplar-Laccaria bicolor Ectomycorrhiza Modifies Root Auxin Metabolism, Signaling, and Response. Alice Vayssières, Ales Pencík, Judith Felten, Annegret Kohler, Karin Ljung, Francis Martin, and Valérie Legué

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