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.
Producing the Ethylene Signal: Regulation and Diversification of Ethylene Biosynthetic Enzymes. Matthew A. Booker and Alison DeLong

Posttranslational modifications control the stability of a key family of biosynthetic enzymes, and phylogenetic analysis indicates recent specialization of this enzyme family in seed plants.

Ethylene and the Regulation of Physiological and Morphological Responses to Nutrient Deficiencies. María José García, Francisco Javier Romera, Carlos Lucena, Esteban Alcántara, and Rafael Pérez-Vicente

Physiological and morphological responses to increase the mobilization and uptake of nutrients from the soil are subject to regulation by ethylene.

Ethylene and Hormonal Cross Talk in Vegetative Growth and Development. Bram Van de Poel, Dajo Smet, and Dominique Van Der Straeten

Recent insights into the role of ethylene in regulating plant growth and development highlight interactions with other hormones.

Role of Ethylene and Its Cross Talk with Other Signaling Molecules in Plant Responses to Heavy Metal Stress. Nguyễn Phượng Thảo, M. Iqbal R. Khan, Nguyễn Bình Anh Thu, Xuân Lan Thi Hoàng, Mohd Asgher, Nafees A. Khan, and Lam-Son Phan Tran

Ethylene regulates plant responses to heavy metal stress through the interaction with other signaling molecules.

Mechanistic Insights in Ethylene Perception and Signal Transduction. Chuanli Ju and Caren Chang

New insights into the ethylene signaling pathway, including dynamic regulatory mechanisms, provide a more comprehensive view of ethylene perception and signal transduction.

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Tobacco Translationally Controlled Tumor Protein Interacts with Ethylene Receptor Tobacco Histidine Kinase1 and Enhances Plant Growth through Promotion of Cell Proliferation. Jian-Jun Tao, Yang-Rong Cao, Hao-Wei Chen, Wei Wei, Qing-Tian Li, Biao Ma, Wan-Ke Zhang, Shou-Yi Chen, and Jin-Song Zhang

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A mutation that impairs ethylene response in pea reveals an interaction of light and ethylene signaling in the control of leaf expansion during deetiolation.

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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 Harmer

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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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A Novel Gene, OZONE-RESPONSIVE APOPLASTIC PROTEIN1, Enhances Cell Death in Ozone Stress in Rice. Yoshiaki Ueda, Shahid Siddique, and Michael Frei

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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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