

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.

FOCUS ON ETHYLENE

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An evolutionarily conserved gene regulates resistance to a devastating necrotrophic fungal crop plant pathogen by controlling major antifungal defense pathways.

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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

Polymorphisms in the promoter sequence are a novel, ozone-responsive protein suggested to affect ozone tolerance in contrasting cultivars.

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

Symbiotic ectomycorrhizal interaction leads to the arrest of root growth and is associated with significant changes in auxin metabolism, signaling, and response.

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