

## **Novel Transcription Factors Affecting Ethylene Sensitivity in Plants**

### **INVENTION:**

Researchers at Salk have found that genetic modifications of Ethylene Response DNA Binding Factors (EDF) proteins and the genes that encode them alters plant sensitivity and responsiveness to ethylene. Plants having reduced sensitivity to ethylene could be useful in the floral industry. These modified plants may have longer flower longevity. Further, EDF genes could be used to create vegetative crops that do not bolt or flower easily. For example, lettuce, spinach, and other leafy vegetables or certain herbs may have higher yields due to decreased floral initiation. Other plants may benefit from decreasing ethylene sensitivity at fruit ripening, by linking a modified EDF gene to a fruit-ripening-specific promoter. Yet another use would be to link the EDF modified gene to a darkness-inducible promoter that could be useful in the long-term storage of certain crops between the time of harvest and sale.

### **APPLICATIONS:**

- Floriculture crops
- Food crops

### **ADVANTAGES:**

- Increased plant biomass
- Enhancement of floral/fruit longevity and shelf life
- Allows for control of fruit ripening

**STAGE OF DEVELOPMENT:** Discovery in Arabidopsis

### **BACKGROUND:**

Ethylene, an endogenous plant hormone is known to affect several aspects of plant growth and development such as germination, fruit ripening, leaf abscission, cell fate determination in root epidermis and responsiveness to stress and pathogen attack. Ethylene also regulates the abscission of plant organs such as leaves, fruits and flowers. A small family of novel transcription factors, termed "Ethylene-Response DNA-Binding Factors" (EDFs) was found to be involved in transcriptional regulation of ethylene-inducible genes and pathways. Genetic modification of these genes alters ethylene-dependent responses in plants and can result in the enhancement of various desirable plant traits.

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**PATENT STATUS:** U.S. Patent 7,169,972

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