

# Metabolic Engineering Increased Vitamin C levels in Lettuce by Overexpression of a L-gulono-1,4-lactone oxidase

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## **Objectives**

The goal of this study is to increase the ascorbic acid contents of transgenic lettuce (*Lactuca sativa* L.). Despite the fact that plants and animals synthesize ascorbic acid via different pathways, transgenic lettuce plants expressing a rat cDNA encoding L-gulono- $\gamma$ -lactone oxidase (GLOase) accumulated up to four times more ascorbic acid than untransformed plants.

### **Material and Methods**

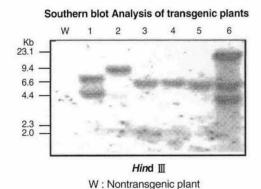
1. Plant material: cotyledons 3 days after seedling of Lettuce (*Lactuca sativa* L.) var. Yeonsanhong

#### 2. Method

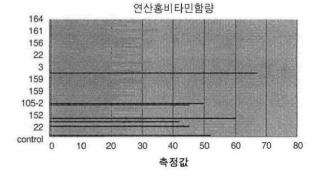
- · Agrobacterium-mediated transformation with GLOase gene.
- · L-ascorbic acid assay: Reflectoquant plus (Merck)

#### **Results and Discussion**

- 1. We have obtained over 100 transformed lettuce plants with 1.7% transformation efficiency.
- 2. Transgenic lettuce plants expressing GLOase contained up to 4-fold more L-ascorbic acid than corresponding controls. This results indicate that transgenically expressed GLOase is capable of utilizing an endogenous substrates effectively for L-ascorbic acid synthesis in lettuce.



1~6: Transgenic plants



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