

INDUCTION OF RESISTANCE TO CUCUMBER MOSAIC VIRUS (CMV) USING HAIRPIN CONSTRUCT OF 2B GENE*

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Abstract

Many plant and animal viruses overcome their host defense by encoding protein that suppress post-transcriptional gene silencing (PTGS). Protein 2b in cucumber mosaic virus (CMV) is regarded as a strong suppressor of PTGS. In the present study the 2b gene of CMV was used to transform of tobacco plant. Possibility of induction of resistance to CMV in the tobacco plants was investigated. Two different constructs, S1 and S2, were used to study PTGS of CMV. The designated S2 construct contained a sequence of sense and antisense of coding region of 2b gene, expected a hairpin-like structure transcribed. Control construct (S1) consisted of the same construct without any sequence of 2b gene. These constructs were first made in pHANNIBALL and then ligated into pART27, a plant specific vector. *Agrobacterium tumefaciens* strain GV3101 was used for stable transformation of *Nicotiana tabacum* Var *xanthi*. Forty regenerated plants were transferred to soil and challenged by CMV inoculation. Thirty three percent of plants showed resistance to CMV while 30% showed delayed in symptom development. Resistance of plants to CMV was confirmed by ELISA. The present study demonstrated that 2b- derived PTGS is an effective plant defense mechanism against CMV and can be used in breeding programs.

Keywords: Cucumber mosaic virus, Post transcriptional gene silencing, Suppression of gene, Resistance, Hairpin constructs.

See Persian text for figures and tables (Pages ۲۰۹-۲۱۹).

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