

Modification of plant gene expression by viral gene silencing suppressors

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【Outline of survey】

The objective of this study is to analyze interactions between plant viruses and infecting host plants during viral pathogenesis in order to develop viral resistant crops. Plants defend viral infection by post-transcriptional gene silencing (PTGS). On the other hands, plant viruses have a counter defense gene called gene silencing suppressor. In this study, we investigate effect of viral gene silencing suppressor activity on host gene expression and on symptoms expression. Effect of two gene silencing suppressors, HC-Pro gene of *Clover yellow vein virus* (CIYVV) and 2b gene of *Cucumber mosaic virus* (CMV), will be investigated by using mutant viruses generated by site-directed mutagenesis. Futhermore, we found that PTGS suppressor rgsCAM gene of tobacco that interacts with HC-Pro gene also suppress PTGS of *Drosophila*. Molecular mechanisms of the plant gene silencing suppressor is also investigated using *Drosophila* system.

【Expected results】

More than 30 viral gene silencing suppressors have been found presently, showing that it is a general strategy for RNA plant viruses to counter-defend viral resistance of a plant. Therefore blocking its activity is a promising strategy to develop a viral resistant coprs. Elucidating interactions between viral gene silencing suppressor and plant genes at molecular level make a big contribution to develop a strategy of generating viral resistant crops.

【References by the principal researcher】

- Yambao, M.L.M., Masuta, C., Nakahara, K. and Uyeda, I. (2003) The central and C-terminal domains of VPg of Clover yellow vein virus are important for VPg-HCPro and VPg-VPg interactions. J. Gen. Virol. 84, 2861-2869.
- Masuta, C., Uyeda, I. et al. (2000) Development of clover yellow vein virus as an efficient, stable gene expression system for legume species. The Plant Journal 23,539-546.

【Term of project】 FY2006 - 2010

【Budget allocation】 29,900,000 yen

【Homepage address】

<http://www.agr.hokudai.ac.jp/ikushu/04.html>