

# Elucidation of mechanism involved in suppressor activity of avirulent genes and its application for control of plant diseases

Shinji Tsuyumu

( Shizuoka University, Faculty of Agriculture, Professor )

## 【Outline of survey】

In general, plants can recognize the invasion of pathogens and suppress the disease development by inducing the cascade of defense reaction. Pathogens can escape from such defense response leading to disease development. In this research, on the basis of our finding that *avrBs3* gene family of plant pathogenic bacteria has the ability to suppress the defense response, such suppressor activity will be investigated for other *avr* genes to find out the basic characters and structures required for such activity. The suppressor activity not only towards to general defense reaction but also to cultivar specific defense reaction will be tested. Since we had been isolated the protein bound to Avr from Citrus, such protein will be searched for other plant sources for the comparative study to find out the specificity between Avrs and their binding proteins. With these information, their role in disease development will be examined using gene silencing of the target genes. Then, we will examine the effectiveness of this strategy in actual disease control.

## 【Expected results】

We should be able to prove the effectiveness of strategy to control plant disease by controlling the suppressor activity of Avr. Furthermore, biological control agents with suppressor-blocker activity and construction of applicable and safe transgenic plants by gene modification will be constructed.

## 【References by the principal researcher】

H. Ishihara, G. Ponciano, J. E. Leach, and S. Tsuyumu, Functional analysis of the 3' end of *avrBs3/pthA* genes from two *Xanthomonas* species. *Physiol. Mole. Plant Pathol.* 63: 329-338 (2004)、

S. Tsuyumu, T. Fujikawa, H. Ishihara, Disease strategy of plant pathogenic bacteria vs defense strategy of plants. *Kagaku to Seibutsu* 41: 157-163 (2004) (in Japanese)

【Term of project】 FY 2005 - 2009

【Budget allocation】 85,700,000 yen

【Homepage address】 <http://www.shizuoka.ac.jp/>