SL202 Study of Interaction Mechanism Between Plant and Virus

Kyung Hee Paek
Korea University

To understand the infection and resistance mechanism in plants by viral infection, we took several approaches. We focused analysis of CMV-Kor movement and 2b protein. The movement protein of virus is required for cell to cell movement of viral RNA through plant intercellular connection, the plasmodesmata. A series of deletion mutants of CMV-Kor movement protein gene were created to identify the functional domains. The mutated movement proteins were produced as an inclusion body in E. coli, purified and renatured. Polyclonal antibody was made using the movement protein expressed in E. coli. The ability of the truncated proteins to bind to ssRNA was assayed using UV cross-linking and gel retardation methods. The results indicated that the domain between amino acids 118 and 160 of movement protein was essential for ssRNA binding. To analyze the biological activity of each domain, mutated genes were introduced into Nicotiana tabacum NC82 by Agrobacterium-mediated transformation. The yeast GAL4 interaction trap was used in order to identify plant host factors interacting with the 2b protein and the clone 2bip1 was identified from tobacco cDNA library. The 2bip1 was not similar to any known gene in plant so far and the function is not known yet. We presume 2bip1 will be one of the plant host factor candidates related to the long-distance movement of CMV. We also set out to isolate defense-related genes that are specifically induced in an interaction between resistant hot pepper (Capsicum annuum) plants and virus. Identification and analyses of some novel genes are presented.