

# Expression of *Bacillus thuringiensis* Cry1Ac Protein Fused with Coat Protein of Potato Leafroll Virus

**Jae Young Choi, Ming Shun Li, Jong Yul Roh, Hee Jin Shim,  
Beom Seok Park<sup>1</sup> and Yeon Ho Je**

School of Agricultural Biotechnology, Seoul National University

<sup>1</sup>Genomics Division, National Institute of Agricultural Biotechnology, RDA

Aphidicidal activity of *Bacillus thuringiensis* crystal proteins was recently reported. However, relatively higher dose of crystal protein was needed to kill aphids. In this study, we intended to improve the aphidicidal activity of crystal protein by fusion with coat protein (CP) of potato leafroll virus (PLRV) which is transmitted by aphids. To fuse *cry1Ac* gene of *B. thuringiensis* with CP gene of PLRV, toxic fragment and domain I of the *cry1Ac* gene were amplified from pProAc vector using specific primers. And CP gene was amplified from pPCP2 vector using specific primer sets. These PCR amplified fragments were serially cloned into pBacPAK8 to generate transfer vectors, pBac8-1Ac, pBac8-1AcCP, pBac8-1AcD1 and pBac8-1AcD1CP. Recombinant viruses, Ap1AcTF, Ap1AcCP, Ap1AcD1 and Ap1AcD1CP were constructed by co-transfection of each transfer vector with bApGOZA genomic DNA into Sf9 cells. As a result, fusion proteins of Cry1Ac-CP (91 kDa) and Cry1Ac domain I-CP (56 kDa) were expressed from High Five cells infected with Ap1AcCP and Ap1AcD1CP, respectively. Also, Cry1Ac toxic region (68 kDa) and domain I region (33 kDa) were expressed from High Five cells infected with Ap1AcTF and Ap1AcD1, respectively.