

Xanthomonas oryzae pv. *oryzae* (Xoo) is a bacterium that causes bacterial blight in rice, especially in Asia. The *hrp* (hypersensitive reaction and pathogenicity) genes are involved in pathogenicity and the induction of hypersensitive response (HR) in nonhost plants. *Hrp* cluster, known as pathogenicity islands (PAIs), is consist of twenty-four *hrp*-related genes and the size is 31.3kb in Xoo KACC10331. In this study, we disrupted *hrcQ* by Tn insertional mutagenesis and marker exchange. PCR amplification and Southern blot was carried out to confirm the *hrcQ* disruption. Furthermore, We are in progress the gene disruption of the all *hrp*-related genes (24 genes) for pathogenicity assay and functional study.

F-67 Volatile organic compounds of rhizobacteria elicit plant growth promotion and induce systemic resistance in tobacco. Choong-Min Ryu^{1,2,4}, Li Kang², Mohamed A Farag^{2,3}, Kirankumar S. Mysore², Paul W Paré³, Joseph W Kloepper⁴, and Seung-Hwang Park¹ ¹Laboratory of Microbial Genomics, Korea Research Institute of Bioscience and Biotechnology, Daejeon 305-600, S. Korea, ²Plant Biology Division, The Samuel Robert Noble Foundation, Ardmore, OK, USA, ³Department of Chemistry and Biochemistry, Texas Tech University, Lubbock, TX, USA, ⁴Department of Entomology and Plant Pathology, Auburn University, Auburn AL, USA.

Plant growth-promoting rhizobacteria (PGPR) are a wide range of root-colonizing bacteria with the capacity to enhance plant growth and control plant pathogens. We recently reported that some PGPR strains release a blend of volatile organic compounds (VOCs) that promote growth in *Arabidopsis* seedlings and induce resistance against *Erwinia carotovora* subsp. *carotovora* (PNAS 100:4927-4932; Plant Physiology 134:1017-1026). In particular, the volatile components 2,3-butanediol and acetoin were released exclusively from two PGPR strains that trigger the greatest level of growth promotion and induced systemic resistance. In the current study we extend these findings to show that the same PGPR strains and their VOCs elicit growth promotion and ISR in tobacco. For practical application of bacterial VOC, exogenous application of racemic 2,3-butanediol or acetoin was done directly to soil by drenching, resulting in elicitation of growth promotion and ISR of *Nicotiana benthamiana* seedlings. These results suggest that bacterial VOCs can be applied directly during crop cultivation for enhancing productivity and disease resistance. To assess involvement of cytokinin signaling as previously shown in *Arabidopsis*, *cre1*-orthologue of *N. benthamiana* was silenced using by Tobacco rattle virus-based virus-induced gene silencing. Our data confirm that cytokinin signaling plays an important role in bacterial VOC-elicited growth promotion and ISR in tobacco.