

**PB-32**

## Control of *Phytophthora capsici* through *NLP* targeting double-strand RNAs

Yujin Kweon<sup>1</sup>, Minsu Park<sup>1,2</sup>, Dowhan Lee<sup>1</sup>, Jihyun Eom<sup>1,3</sup>, Minsun Oh<sup>1,3</sup>, Chanseok Shin<sup>1,2,3,4</sup>

<sup>1</sup>Department of Agricultural Biotechnology, Seoul National University, Seoul 08826, Republic of Korea

<sup>2</sup>Research Institute of Agriculture and Life Sciences, Seoul National University, Seoul 08826, Republic of Korea

<sup>3</sup>Research Center for Plant Plasticity, Seoul National University, Seoul 08826, Republic of Korea

<sup>4</sup>Plant Genomics and Breeding Institute, Seoul National University, Seoul 08826, Republic of Korea

### [Introduction]

*Phytophthora capsici* (*P. capsici*) is a highly infectious pathogen in solanaceous crops such as pepper, potato, and tomato. The economic losses caused by the *p. capsici* are still severe in Korea. In this study, we controlled *P. capsici* infection using exogenous double-strand RNAs (dsRNAs)-induced RNA interference (RNAi) mechanism. RNAi is a regulatory mechanism generated by small RNAs. Application of exogenous dsRNA designed to target mRNA sequence induces small interfering RNAs which can cause RNAi.

### [Materials and Methods]

We selected two kinds of Necrosis and ethylene-inducing peptide 1-like protein genes (*NLP*) for the target effectors. We designed and synthesized several dsRNAs based on the target sequences. Three-week-old *Nicotiana Benthamiana* were selected as a host plant. Two days before the *P. capsici* infection, dsRNAs targeting *NLP* effectors were infiltrated by a syringe.

### [Results and Discussion]

We found the exogenous dsRNAs that we designed could suppress the pathogenesis of *P. capsici* successfully. Also, we figured out that the downregulation of *NLP* effectors affected the expression of defense-related genes. Research on these dsRNAs can contribute to the RNAi-based crop protection. In addition, our study suggests that RNAi can be a useful tool for the plant disease control.

### [Acknowledgement]

This work was supported by a grand from the New breeding technologies development Program (Project No. PJ01652102), Rural Development Administration and by the National Research Foundation of Korea (NRF) grant funded by the Korea government (MSIT) (No. 2021R1A5A1032428).

\*Corresponding author: E-mail, cshin@snu.ac.kr Tel. +82-2-880-4643.