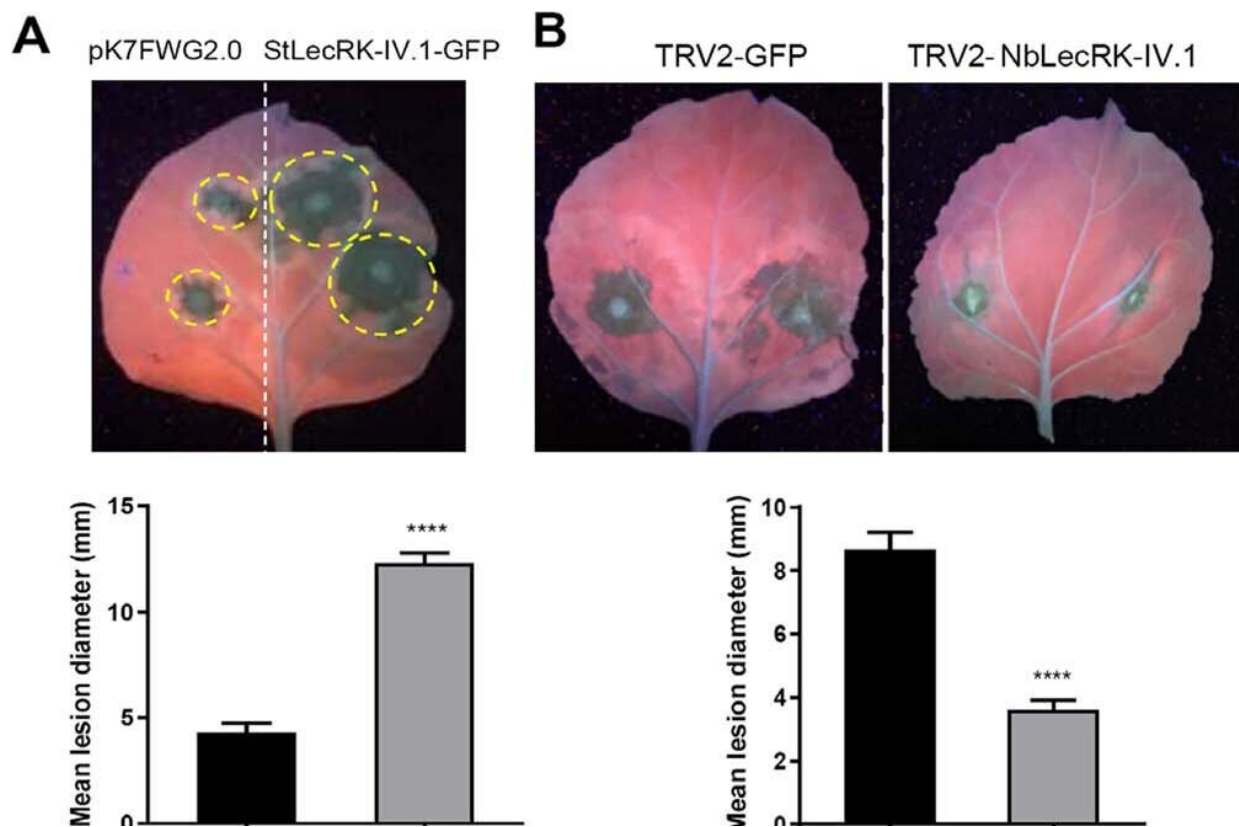


Scientists characterize the potato L-type lectin StLecRK-IV.1, which negatively regulates late blight resistance

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StLecRK-IV.1 promotes *P. infestans* colonization. Credit: *Horticulture Research*

In recent work published in the journal *Horticulture Research*, researchers from Northeast Agricultural University and Huazhong

Agricultural University characterized a negative regulator of late blight resistance in potato.

They showed that a [potato](#) LecRLK, StLecRK-IV.1, participates in [plant immunity](#) against *P. infestans* by serving as a negative regulator. The transient expression of StLecRK-IV.1 in *Nicotiana benthamiana* significantly enhanced leaf colonization by *P. infestans*. By contrast, the size of disease lesions caused by *P. infestans* was reduced by virus-induced gene silencing of the StLecRK-IV.1 ortholog in *N. benthamiana*, as well as in potato plants with stable RNA interference of StLecRK-IV.1. The expression of StLecRK-IV.1 was downregulated by *P. infestans* and activated by abscisic acid.

Tetraspanins, which belong to the transmembrane 4 superfamily (TM4SF), are integral membrane components for endosome organization and are widely distributed in mammals, insects, fungi, mosses, and higher plants. There are 17 tetraspanin (TET)-like genes in the *Arabidopsis* genome, of which TET8 and TET9 are mammalian CD63 orthologs. The *Arabidopsis* tet8 mutant shows reduced formation of extracellular vesicles (EVs), accompanied by an impaired [reactive oxygen species](#) (ROS) burst in response to stressors, suggesting a role for TET8 in the formation of EVs. Like CD63 in mammals, TET8 is also considered a specific marker for exosomes in plants, and TET8-associated EVs can be considered plant exosomes. *Botrytis cinerea* induces TET8 and TET9-associated vesicle accumulation at the sites of infection, and TET8- and TET9-associated exosomes contribute to plant immunity against *B. cinerea* infection by transferring host small RNAs (sRNAs) into fungal cells, where they suppress pathogenicity by targeting virulence genes.

In this study, researchers used a membrane yeast two-hybrid system to demonstrate that tetraspanin-8 (StTET8) interacted with StLecRK-IV.1, and this result was further verified by co-immunoprecipitation, a

luciferase complementation assay, and a bimolecular fluorescence complementation test. StTET8 is a positive immune regulator that limits *P. infestans* infection. The co-expression of StLecRK-IV.1 with StTET8 antagonized the positive roles of StTET8 against *P. infestans*. Moreover, the co-expression of StTET8 with StLecRK-IV.1 affected the stability of StTET8, a result that was confirmed by a western blot assay and a confocal assay.

"Our evidence demonstrated that a potato StLecRK-IV.1 negatively regulates late blight resistance by interacting with and affecting the protein stability of a positive regulator, StTET8," the authors said. "This work provides a novel interaction mechanism of how a plant LecRLK regulates the immunity of plants."

More information: Lei Guo et al, Potato StLecRK-IV.1 negatively regulates late blight resistance by affecting the stability of a positive regulator StTET8, *Horticulture Research* (2022). [DOI: 10.1093/hr/uhac010](https://doi.org/10.1093/hr/uhac010)

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