04-1-25

Analysis of mechanism underlying the inhibition of AvrRpm1/RPM1 functions by AvrRpt2 in the Arabidopsis thaliana

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Objectives

Using the isogenic *P.syringae* strains and Arabidopsis mutants that differ from only specific avirulence genes and resistance genes, respectively, we investigated what will happen in each R gene-mediated resistance when two avirulence signals are delivered simultaneously into the plant cell.

Materials and Methods

1. Materials

Plant - Arabidopsis Col-0 (rps2 mutants)

Transgenic plants - rps2(gRPM1-myc)

P.syringae strain - DC3000 (avrRpt2)

2. Methods : bacterial leaf infiltration, western blot analysis.

Results and Discussion

We investigated the molecular mechanisms by which AvrRpt2 not only interfered with AvrRpm1/RPM1-mediated resistance signal but also induced degradation of RPM1 protein. Disappearance of RPM1 was not a direct cause for interference of AvrRpm1/RPM1-mediated resistance signal by AvrRpt2, because RPM1 protein was not completely degraded at the time point when AvrRpt2 interferes with AvrRpm1/RPM1-mediated resistance signal. In consistent with recent reports, AvrRpt2 targeted and eliminated RIN4 prior to phosphorylation of RIN4 by AvrRpm1 that is required for activation and stability of RPM1. As a result, AvrRpt2 preventing from action of AvrRpm1 equally delivered to plant cell and induced disappearance of RPM1. Furthermore, AvrRpt2 also eliminated RIN4 that is already phosphorylated by AvrRpm1. These results clearly demonstrated that only AvrRpt2 can interfere with AvrRpm1 function, but not in the reverse.

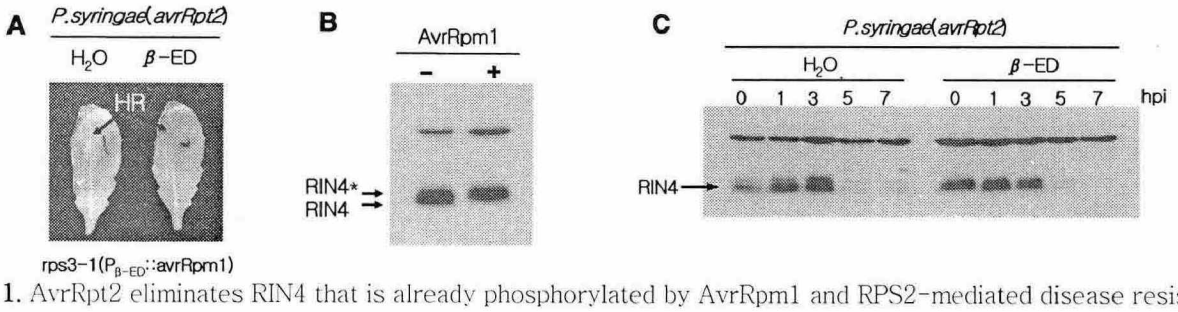

Fig. 1. AvrRpt2 eliminates RIN4 that is already phosphorylated by AvrRpm1 and RPS2-mediated disease resistance

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