

RRS1 (https://www.gephebase.org/search-criteria?/and+GeneGephebase=~RRS1^#gephebase-summary-title)	Gephebase Gene	GP00001015	GepheID
Published	Entry Status	Martin	Main curator

	Trait Category
Physiology (https://www.gephebase.org/search-criteria?/and+Trait+Category=~Physiology^#gephebase-summary-title)	
	Trait
Pathogen resistance (https://www.gephebase.org/search-criteria?/and+Trait=~Pathogen+resistance^#gephebase-summary-title)	
	Trait State in Taxon A
Arabidopsis thaliana	
	Trait State in Taxon B
Arabidopsis thaliana	
	Ancestral State
Data not curated	
	Taxonomic Status
Intraspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=~Intraspecific^#gephebase-summary-title)	

GENOTYPIC CHANGE

GO:0003700 : DNA-binding transcription factor activity
(<https://www.ebi.ac.uk/QuickGO/term/GO:0003700>)
GO:0043565 : sequence-specific DNA binding
(<https://www.ebi.ac.uk/QuickGO/term/GO:0043565>)
GO:0043531 : ADP binding (<https://www.ebi.ac.uk/QuickGO/term/GO:0043531>)
GO - Biological Process
GO:0006952 : defense response (<https://www.ebi.ac.uk/QuickGO/term/GO:0006952>)
GO - Cellular Component
GO:0005737 : cytoplasm (<https://www.ebi.ac.uk/QuickGO/term/GO:0005737>)
GO:0005634 : nucleus (<https://www.ebi.ac.uk/QuickGO/term/GO:0005634>)

Presumptive Null

Yes (<https://www.gephebase.org/search-criteria?/and+Presumptive+Null=~Yes^#gephebase-summary-title>)

Molecular Type

Coding (<https://www.gephebase.org/search-criteria?/and+Molecular+Type=~Coding^#gephebase-summary-title>)

Aberration Type

SNP (<https://www.gephebase.org/search-criteria?/and+Aberration+Type=~SNP^#gephebase-summary-title>)

SNP Coding Change

Nonsense

Molecular Details of the Mutation

Premature stop codon

Experimental Evidence

Linkage Mapping (<https://www.gephebase.org/search-criteria?/and+Experimental+Evidence=~Linkage+Mapping^#gephebase-summary-title>)

	Taxon A	Taxon B	Position
Codon	-	-	-
Amino-acid	-	-	-

Main Reference

RRS1 and RPS4 provide a dual Resistance-gene system against fungal and bacterial pathogens. (2009) (<https://pubmed.ncbi.nlm.nih.gov/19519800>)

Authors

Narusaka M; Shirasu K; Noutoshi Y; Kubo Y; Shiraishi T; Iwabuchi M; Narusaka Y

Abstract

Colletotrichum higginsianum is a fungal pathogen that infects a wide variety of cruciferous plants, causing important crop losses. We have used map-based cloning and natural variation analysis of 19 Arabidopsis ecotypes to identify a dominant resistance locus against C. higginsianum. This locus named RCH2 (for recognition of C. higginsianum) maps in an extensive cluster of disease-resistance loci known as MRC-J in the Arabidopsis ecotype Ws-0. By analyzing natural variations within the MRC-J region, we found that alleles of RRS1 (resistance to Ralstonia solanacearum 1) from susceptible ecotypes contain single nucleotide polymorphisms that may affect the encoded protein. Consistent with this finding, two susceptible mutants, rrs1-1 and rrs1-2, were identified by screening a T-DNA-tagged mutant library for the loss of resistance to C. higginsianum. The screening identified an additional susceptible mutant (rps4-21) that has a 5-bp deletion in the neighboring gene, RPS4-Ws, which is a well-characterized R gene that provides resistance to Pseudomonas syringae pv. tomato strain DC3000 expressing avrRps4 (Pst-avrRps4). The rps4-21/rrs1-1 double mutant exhibited similar levels of susceptibility to C. higginsianum as the single mutants. We also found that both RRS1 and RPS4 are required for resistance to R. solanacearum and Pst-avrRps4. Thus, RPS4-Ws and RRS1-Ws function as a dual resistance gene system that prevents infection by three distinct pathogens.

Additional References

A locus conferring resistance to Colletotrichum higginsianum is shared by four geographically distinct Arabidopsis accessions. (2009) (<https://pubmed.ncbi.nlm.nih.gov/19686535>)

RELATED GEPHE

Related Genes

20 (ACD6 = ACCELERATED CELL DEATH 6, ERECTA, RAC1, Resistance related Kinase 1 (RKS1), RLM1, RLM2 cluster, RLM3, RPM1, RPP1-WsA, RPP1-WsB, RPP1-WsC, RPP13, RPP2A-RPP2B, RPP4, RPP5, RPP8, RPS2, RPS4, RPS5, WRR4) (<https://www.gephebase.org/search-criteria?/or+Taxon+ID=~3702^/and+Trait=Pathogen+resistance/and+groupHaplotypes=true#gephebase-summary-title>)

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS

