

## GEPHE SUMMARY

RPP2A-RPP2B ( <a href="https://www.gephebase.org/search-criteria/?and+Gene+Gephebase=%RPP2A-RPP2B%#gephebase-summary-title">https://www.gephebase.org/search-criteria/?and+Gene Gephebase=%RPP2A-RPP2B%#gephebase-summary-title</a> )	Gephebase Gene	GP00001006	GepheID
	Entry Status	Martin	Main curator
Published			

## PHENOTYPIC CHANGE

	Trait Category		
Physiology ( <a href="https://www.gephebase.org/search-criteria/?and+Trait+Category=%Physiology%#gephebase-summary-title">https://www.gephebase.org/search-criteria/?and+Trait+Category=%Physiology%#gephebase-summary-title</a> )	Trait		
Pathogen resistance ( <a href="https://www.gephebase.org/search-criteria/?and+Trait=%Pathogen+resistance%#gephebase-summary-title">https://www.gephebase.org/search-criteria/?and+Trait=%Pathogen+resistance%#gephebase-summary-title</a> )	Trait State in Taxon A		
Arabidopsis thaliana- Col0 - resistant	Trait State in Taxon B		
Arabidopsis thaliana- Nd1 - sensitive	Ancestral State		
Data not curated	Taxonomic Status		
Intraspecific ( <a href="https://www.gephebase.org/search-criteria/?and+Taxonomic+Status=%Intraspecific%#gephebase-summary-title">https://www.gephebase.org/search-criteria/?and+Taxonomic+Status=%Intraspecific%#gephebase-summary-title</a> )			
Taxon A		Taxon B	
Arabidopsis thaliana ( <a href="https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=%Arabidopsis+thaliana%#gephebase-summary-title">https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=%Arabidopsis+thaliana%#gephebase-summary-title</a> )	Latin Name	Arabidopsis thaliana ( <a href="https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=%Arabidopsis+thaliana%#gephebase-summary-title">https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=%Arabidopsis+thaliana%#gephebase-summary-title</a> )	Latin Name
thale cress	Common Name	thale cress	Common Name
thale cress; mouse-ear cress; thale-cress; Arabidopsis thaliana (L.) Heynh.; Arabidopsis thaliana (thale cress); Arabidopsis_thaliana; Arbisopsis thaliana; thale kress	Synonyms	thale cress; mouse-ear cress; thale-cress; Arabidopsis thaliana (L.) Heynh.; Arabidopsis thaliana (thale cress); Arabidopsis_thaliana; Arbisopsis thaliana; thale kress	Synonyms
species	Rank	species	Rank
cellular organisms; Eukaryota; Viriplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; malvids; Brassicales; Brassicaceae; Camelinae; Arabidopsis	Lineage	cellular organisms; Eukaryota; Viriplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; malvids; Brassicales; Brassicaceae; Camelinae; Arabidopsis	Lineage
Arabidopsis () - (Rank: genus) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3701">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3701</a> )	Parent	Arabidopsis () - (Rank: genus) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3701">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3701</a> )	Parent
3702 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3702">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3702</a> )	NCBI Taxonomy ID	3702 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3702">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3702</a> )	NCBI Taxonomy ID
is Taxon A an Infraspecies?		is Taxon B an Infraspecies?	
Yes	Taxon A Description	Yes	Taxon B Description
Arabidopsis thaliana- Col0 - resistant		Arabidopsis thaliana- Nd1 - sensitive	

## GENOTYPIC CHANGE

RPP2A	Generic Gene Name	UniProtKB Arabidopsis thaliana
F15K20.18; F15K20_18; At2g27720	Synonyms	GenebankID or UniProtKB
-	String	
Belongs to the eukaryotic ribosomal protein P1/P2 family.	Sequence Similarities	
GO:0003735 : structural constituent of ribosome ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0003735">https://www.ebi.ac.uk/QuickGO/term/GO:0003735</a> )	GO - Molecular Function	
GO:0006414 : translational elongation ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0006414">https://www.ebi.ac.uk/QuickGO/term/GO:0006414</a> )	GO - Biological Process	
	GO - Cellular Component	

GO:0005840 : ribosome (<https://www.ebi.ac.uk/QuickGO/term/GO:0005840>)

Presumptive Null

Unknown ([#gephebase-summary-title\)](https://www.gephebase.org/search-criteria?/and+Presumptive+Null=^Unknown)

Molecular Type

Coding ([#gephebase-summary-title\)](https://www.gephebase.org/search-criteria?/and+Molecular+Type=^Coding)

Aberration Type

Unknown ([#gephebase-summary-title\)](https://www.gephebase.org/search-criteria?/and+Aberration+Type=^Unknown)

Molecular Details of the Mutation

unknown

Experimental Evidence

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

Main Reference

Two TIR:NB:LRR genes are required to specify resistance to *Peronospora parasitica* isolate Cala2 in *Arabidopsis*. (2004) (<https://pubmed.ncbi.nlm.nih.gov/15165183>)

Authors

Sinapidou E; Williams K; Nott L; Bahkt S; TÃ¶r M; Crute I; Bittner-Eddy P; Beynon J

Abstract

Resistance responses that plants deploy in defence against pathogens are often triggered following a recognition event mediated by resistance (R) genes. The encoded R proteins usually contain a nucleotide-binding site (NB) and a leucine-rich repeat (LRR) domain. They are further classified into those that contain an N-terminal coiled coil (CC) motif or a Toll interleukin receptor (TIR) domain. Such R genes, when transferred into a susceptible plant of the same or closely related species, usually impart full resistance capability. We have used map-based cloning and mutation analysis to study the recognition of *Peronospora parasitica* (RPP2) (At) locus in *Arabidopsis* accession Columbia (Col-0), which is a determinant of specific recognition of *P. parasitica* (At) isolate Cala2. Genetic mapping located RPP2 to a 200-kb interval on chromosome 4, which contained four adjacent TIR:NB:LRR genes. Mutational analysis revealed three classes of genes involved in specifying resistance to Cala2. One class, which resulted in pleiotropic effects on resistance to other *P. parasitica* (At) isolates, was unlinked to the RPP2 locus; this class included AtSGT1b. The other two classes were mapped within the interval and were specific to Cala2 resistance. Representatives of each of these classes were sequenced, and mutations were found in one or the other of two (RPP2A and RPP2B) of the four TIR:NB:LRR genes. RPP2A and RPP2B complemented their specific mutations, but failed to impart resistance when present alone, and it is concluded that both genes are essential determinants for isolate-specific recognition of Cala2. RPP2A has an unusual structure with a short LRR domain at the C-terminus, preceded by two potential but incomplete TIR:NB domains. In addition, the RPP2A LRR domain lacks conserved motifs found in all but three other TIR:NB:LRR class proteins. In contrast, RPP2B has a complete TIR:NB:LRR structure. It is concluded that RPP2A and RPP2B cooperate to specify Cala2 resistance by providing recognition or signalling functions lacked by either partner protein.

Additional References

## 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, RPP4, RPP5, RPP8, RPS2, RPS4, RPS5, RRS1, WRR4) ([#gephebase-summary-title\)](https://www.gephebase.org/search-criteria?/or+Taxon+ID=^3702/and+Trait=Pathogen+resistance/and+groupHaplotypes=true)

Related Haplotypes

No matches found.

## EXTERNAL LINKS

## COMMENTS

Cluster of paralogous genes