

GEPHE SUMMARY

	Gephebase Gene		GepheID
RPP2A-RPP2B (https://www.gephebase.org/search-criteria?/and+GeneGephebase=~RPP2A-RPP2B^#gephebase-summary-title)		GP00001006	
	Entry Status	Martin	Main curator
Published			

PHENOTYPIC CHANGE

	Trait Category		
Physiology (https://www.gephebase.org/search-criteria?/and+TraitCategory=~Physiology^#gephebase-summary-title)		Trait	
Pathogen resistance (https://www.gephebase.org/search-criteria?/and+Trait=~Pathogenresistance^#gephebase-summary-title)			
	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 (https://www.gephebase.org/search-criteria?/and+TaxonomicStatus=~Intraspecific^#gephebase-summary-title)			
	Taxon A		Taxon B
	Latin Name		Latin Name
Arabidopsis thaliana (https://www.gephebase.org/search-criteria?/and+TaxonandSynonyms=~Arabidopsisthaliana^#gephebase-summary-title)		Arabidopsis thaliana (https://www.gephebase.org/search-criteria?/and+TaxonandSynonyms=~Arabidopsisthaliana^#gephebase-summary-title)	
	Common Name		Common Name
thale cress		thale cress	
	Synonyms		Synonyms
thale cress; mouse-ear cress; thale-cress; Arabidopsis thaliana (L.) Heynh.; Arabidopsis thaliana (thale cress); Arabidopsis_thaliana; Arbisopsis thaliana; thale kress		thale cress; mouse-ear cress; thale-cress; Arabidopsis thaliana (L.) Heynh.; Arabidopsis thaliana (thale cress); Arabidopsis_thaliana; Arbisopsis thaliana; thale kress	
	Rank		Rank
species		species	
	Lineage		Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetales; rosids; malvids; Brassicales; Brassicaceae; Camelineae; Arabidopsis		cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetales; rosids; malvids; Brassicales; Brassicaceae; Camelineae; Arabidopsis	
	Parent		Parent
Arabidopsis () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3701)		Arabidopsis () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3701)	
	NCBI Taxonomy ID		NCBI Taxonomy ID
3702 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3702)		3702 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3702)	
	is Taxon A an Intraspecies?		is Taxon B an Intraspecies?
Yes		Yes	
	Taxon A Description		Taxon B Description
Arabidopsis thaliana- Col0 - resistant		Arabidopsis thaliana- Nd1 - sensitive	

GENOTYPIC CHANGE

	Generic Gene Name		UniProtKB Arabidopsis thaliana
RPP2A		P51407 (http://www.uniprot.org/uniprot/P51407)	
	Synonyms		GenebankID or UniProtKB
F15K20.18; F15K20_18; At2g27720		AC005824 (https://www.ncbi.nlm.nih.gov/nuccore/AC005824)	
-			
	String		
	Sequence Similarities		
Belongs to the eukaryotic ribosomal protein P1/P2 family.			
	GO - Molecular Function		
GO:0003735 : structural constituent of ribosome (https://www.ebi.ac.uk/QuickGO/term/GO:0003735)			
	GO - Biological Process		
GO:0006414 : translational elongation (https://www.ebi.ac.uk/QuickGO/term/GO:0006414)			
	GO - Cellular Component		

GO:0005840 : ribosome (https://www.ebi.ac.uk/QuickGO/term/GO:0005840)	Presumptive Null
Unknown (https://www.gephebase.org/search-criteria?/and+Presumptive Null=~Unknown^#gephebase-summary-title)	Molecular Type
Coding (https://www.gephebase.org/search-criteria?/and+Molecular Type=~Coding^#gephebase-summary-title)	Aberration Type
Unknown (https://www.gephebase.org/search-criteria?/and+Aberration Type=~Unknown^#gephebase-summary-title)	Molecular Details of the Mutation
unknown	Experimental Evidence
Linkage Mapping (https://www.gephebase.org/search-criteria?/and+Experimental Evidence=~Linkage Mapping^#gephebase-summary-title)	Main Reference
Two TIR:NB:LRR genes are required to specify resistance to <i>Peronospora parasitica</i> isolate Cala2 in <i>Arabidopsis</i> . (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 <i>Peronospora parasitica</i> (RPP)2 (At) locus in <i>Arabidopsis</i> accession Columbia (Col-0), which is a determinant of specific recognition of <i>P. parasitica</i> (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 <i>P. parasitica</i> (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) (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

Cluster of paralogous genes