

GEPHE SUMMARY

	Gephebase Gene	GephelD
RLM3 (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^RLM3^#gephebase-summary-title)	GP00000993	Main curator
Published	Entry Status	Martin

PHENOTYPIC CHANGE

	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-Col0 - resistant	Trait State in Taxon B	
Arabidopsis thaliana- An-1 sensitive	Ancestral State	
Data not curated	Taxonomic Status	
Intraspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic Status=^Intraspecific^#gephebase-summary-title)		
Taxon A		Taxon B
	Latin Name	Latin Name
Arabidopsis thaliana (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Arabidopsis+thaliana^#gephebase-summary-title)		Arabidopsis thaliana (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Arabidopsis+thaliana^#gephebase-summary-title)
thale cress	Common Name	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
species	Rank	Rank
	Lineage	Lineage
cellular organisms; Eukaryota; Viriplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; malvids; Brassicales; Brassicaceae; Camelinae; Arabidopsis		cellular organisms; Eukaryota; Viriplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; malvids; Brassicales; Brassicaceae; Camelinae; Arabidopsis
Arabidopsis () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3701)	Parent	Parent
3702 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3702)	NCBI Taxonomy ID	NCBI Taxonomy ID
is Taxon A an Infraspecies?		is Taxon B an Infraspecies?
Yes	Taxon A Description	Taxon B Description
Arabidopsis thaliana-Col0 - resistant		Arabidopsis thaliana- An-1 sensitive

GENOTYPIC CHANGE

	Generic Gene Name	UniProtKB Arabidopsis thaliana
RLM3	Synonyms	GenebankID or UniProtKB
DL4525W; FCAALL..324; RESISTANCE TO LEPTOSPHAERIA MACULANS 3; At4g16990; dl4525w		AJ299417 (https://www.ncbi.nlm.nih.gov/nuccore/AJ299417)
3702.AT4G16990.2 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier=3702.AT4G16990.2)	String	
-	Sequence Similarities	
	GO - Molecular Function	
GO:0005524 : ATP binding (https://www.ebi.ac.uk/QuickGO/term/GO:0005524)		
GO:0043531 : ADP binding (https://www.ebi.ac.uk/QuickGO/term/GO:0043531)		
	GO - Biological Process	

GO:0007165 : signal transduction (<https://www.ebi.ac.uk/QuickGO/term/GO:0007165>)

GO:0009817 : defense response to fungus, incompatible interaction

(<https://www.ebi.ac.uk/QuickGO/term/GO:0009817>)

GO:2000071 : regulation of defense response by callose deposition

(<https://www.ebi.ac.uk/QuickGO/term/GO:2000071>)

GO - Cellular Component

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

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

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

gene deletion

Molecular Details of the Mutation

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

Main Reference

RLM3, a TIR domain encoding gene involved in broad-range immunity of Arabidopsis to necrotrophic fungal pathogens. (2008) (<https://pubmed.ncbi.nlm.nih.gov/18397376>) Authors

Staal J; Kaliff M; Dewaele E; Persson M; Dixelius C

Abstract

Here, we describe the rapid cloning of a plant gene, *Leptosphaeria maculans* 3 (RLM3(Col)), which encodes a putative Toll interleukin-1 receptor-nucleotide binding (TIR-NB) class protein, which is involved in defence against the fungal pathogen *L. maculans* and against three other necrotrophic fungi. We have, through microarray-based case control bulk segregant comparisons of transcriptomes in pools of Col-0 x An-1 progeny, identified the absence of a locus that causes susceptibility in An-1. The significance of this locus on chromosome 4 for *L. maculans* resistance was supported by PCR-based mapping, and denoted resistance to RLM3(Col). Differential susceptible phenotypes in four independent T-DNA insertion lines support the hypothesis that At4g16990 is required for RLM3(Col) function. The mutants in RLM3(Col) also exhibited an enhanced susceptibility to *Botrytis cinerea*, *Alternaria brassicicola* and *Alternaria brassicae*. Complementation of An-1 and T-DNA mutants using overexpression of a short transcript lacking the NB-ARC domain, or a genomic clone, restored resistance to all necrotrophic fungi. The elevated expression of RLM3(Col) on *B. cinerea*-susceptible mutants further suggested convergence in signalling and gene regulation between defence against *B. cinerea* and *L. maculans*. In the case of *L. maculans*, RLM3(Col) is required for efficient callose deposition downstream of RLM1(Col).

Additional References

RELATED GEPHE

Related Genes

20 (ACD6 = ACCELERATED CELL DEATH 6, ERECTA, RAC1, Resistance related Kinase 1 (RKS1), RLM1, RLM2 cluster, RPM1, RPP1-WsA, RPP1-WsB, RPP1-WsC, RPP13, RPP2A-RPP2B, 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