

GEPHE SUMMARY

Mla1 (https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=Mla1#gephebase-summary-title)	Gephebase Gene	GP00000669	GepheID
Published	Entry Status	Martin	Main curator

PHENOTYPIC CHANGE

Physiology (https://www.gephebase.org/search-criteria?/and+Trait+Category=Physiology#gephebase-summary-title)	Trait Category		
Pathogen resistance (https://www.gephebase.org/search-criteria?/and+Trait=Pathogen+resistance#gephebase-summary-title)	Trait		
Triticum monococum - susceptible	Trait State in Taxon A		
Triticum monococum - resistant	Trait State in Taxon B		
Data not curated	Ancestral State		
Domesticated (https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=Domesticated#gephebase-summary-title)	Taxonomic Status		
	Taxon A		Taxon B
	Latin Name		Latin Name
Triticum monococum (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=Triticum+monococum#gephebase-summary-title)	Latin Name	Triticum monococum (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=Triticum+monococum#gephebase-summary-title)	Latin Name
-	Common Name	-	Common Name
	Synonyms		Synonyms
Crithodium monococum; einkorn wheat; one-grained wheat; small spelt; Crithodium monococum (L.) A.Love; Triticum monococum L.	Synonyms	Crithodium monococum; einkorn wheat; one-grained wheat; small spelt; Crithodium monococum (L.) A.Love; Triticum monococum L.	Synonyms
species	Rank	species	Rank
	Lineage		Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Pooideae; Triticodae; Triticeae; Triticinae; Triticum	Lineage	cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Pooideae; Triticodae; Triticeae; Triticinae; Triticum	Lineage
	Parent		Parent
Triticum () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4564)	Parent	Triticum () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4564)	Parent
4568 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4568)	NCBI Taxonomy ID	4568 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4568)	NCBI Taxonomy ID
	is Taxon A an Intraspecies?		is Taxon B an Intraspecies?
No		No	

GENOTYPIC CHANGE

Mla1	Generic Gene Name	UniProtKB Hordeum vulgare subsp. vulgare Q7EXP5 (http://www.uniprot.org/uniprot/Q7EXP5)	
-	Synonyms	ADX06722 (https://www.ncbi.nlm.nih.gov/nuccore/ADX06722)	GenebankID or UniProtKB
-	String		
	Sequence Similarities		
Belongs to the disease resistance NB-LRR family.			
	GO - Molecular Function		
GO:0043531 : ADP binding (https://www.ebi.ac.uk/QuickGO/term/GO:0043531)	GO - Molecular Function		
-	GO - Biological Process		
	GO - Cellular Component		
			Presumptive Null
No (https://www.gephebase.org/search-criteria?/and+Presumptive+Null=No#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

Coding variation in the LRR domain

Experimental Evidence

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

Main Reference

The MLA6 coiled-coil, NBS-LRR protein confers AvrMla6-dependent resistance specificity to *Blumeria graminis* f. sp. *hordei* in barley and wheat. (2001) (<https://pubmed.ncbi.nlm.nih.gov/11208025>)

Authors

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Abstract

The barley Mla locus confers multiple resistance specificities to the obligate fungal biotroph, *Blumeria* (= *Erysiphe*) *graminis* f. sp. *hordei*. Interspersed within the 240 kb Mla complex are three families of resistance gene homologs (RGHs). Probes from the Mla-RGH1 family were used to identify three classes of cDNAs. The first class is predicted to encode a full-length CC-NBS-LRR protein and the other two classes contain alternatively spliced, truncated variants. Utilizing a cosmid that contains a gene corresponding to the full-length candidate cDNA, two single-cell expression assays were used to demonstrate complementation of AvrMla6-dependent, resistance specificity to *B. graminis* in barley and wheat. The first of these assays was also used to substantiate previous genetic data that the Mla6 allele requires the signaling pathway component, Rar1, for function. Computational analysis of MLA6 and the Rar1-independent, MLA1 protein reveals 91.2% identity and shows that the LRR domain is subject to diversifying selection. Our findings demonstrate that highly related CC-NBS-LRR proteins encoded by alleles of the Mla locus can dictate similar powdery mildew resistance phenotypes yet still require distinct downstream signaling components.

Additional References

The wheat Mla homologue TmMla1 exhibits an evolutionarily conserved function against powdery mildew in both wheat and barley. (2011) (<https://pubmed.ncbi.nlm.nih.gov/21208308>)

RELATED GEPHE

Related Genes

1 (CNL9 (=Sr35)) (<https://www.gephebase.org/search-criteria?/or+Taxon+ID=^4568^/and+Trait=Pathogen+resistance/and+groupHaplotypes=true#gephebase-summary-title>)

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS