

GEPHE SUMMARY

	Gephebase Gene		GepheID
Mla1 (https://www.gephebase.org/search-criteria?/and+GeneGephebase=~Mla1~#gephebase-summary-title)		GP00000668	
	Entry Status	Courtier	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	
Hordeum vulgare - susceptible		
	Trait State in Taxon B	
Hordeum vulgare - resistant		
	Ancestral State	
Data not curated		
	Taxonomic Status	
Domesticated (https://www.gephebase.org/search-criteria?/and+TaxonomicStatus=~Domesticated~#gephebase-summary-title)		

Taxon A		Taxon B	
	Latin Name		Latin Name
Hordeum vulgare (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Hordeumvulgare~#gephebase-summary-title)		Hordeum vulgare (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Hordeumvulgare~#gephebase-summary-title)	
	Common Name		Common Name
-		-	
	Synonyms		Synonyms
barley; Hordeum vulgare L.; Horedum vulgare		barley; Hordeum vulgare L.; Horedum vulgare	
	Rank		Rank
species		species	
	Lineage		Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Pooideae; Triticodae; Triticeae; Hordeinae; Hordeum		cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Pooideae; Triticodae; Triticeae; Hordeinae; Hordeum	
	Parent		Parent
Hordeum () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4512)		Hordeum () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4512)	
	NCBI Taxonomy ID		NCBI Taxonomy ID
4513 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4513)		4513 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4513)	
is Taxon A an Intraspecies?		is Taxon B an Intraspecies?	
No		No	

GENOTYPIC CHANGE

	Generic Gene Name		UniProtKB Hordeum vulgare subsp. vulgare
Mla1		Q7EXP5 (http://www.uniprot.org/uniprot/Q7EXP5)	
	Synonyms		GenebankID or UniProtKB
-		AAG37356 (https://www.ncbi.nlm.nih.gov/nuccore/AAG37356)	
	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 - 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)			

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

Aberration Type

SNP Coding Change

Nonsynonymous

Molecular Details of the Mutation

Coding variation in the LRR domain - exact amino acid change unknown

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

Recombination of alleles conferring specific resistance to powdery mildew at the Mla locus in barley. (1994) (<https://pubmed.ncbi.nlm.nih.gov/18470091>)

Authors

Mahadevappa M; Descenzo RA; Wise RP

In barley (*Hordeum vulgare* L.), the Mla locus conditions reaction to the powdery mildew fungus *Erysiphe graminis* f.sp. *hordei*. Enrichment for genetic recombinants in the Mla region is possible by screening for recombination events between the flanking endosperm storage proteins hordeins C and B. Reciprocal crosses were made between the Franger (C.I. 16151) and Rupee (C.I. 16155) lines carrying the (Mla6 + Mla14) and Mla13 alleles, respectively. Recombinants were identified from F2 segregants by analyzing the extracted hordein polypeptides by sodium dodecyl sulphate - polyacrylamide gel electrophoresis. Two hundred and seventy-six recombinant gametes were identified from the 1800 seeds that were screened. Recombination of Mla alleles was analyzed by inoculating F4 recombinant lines with three isolates of *E. graminis* (A27, 5874, and CR3), which recognize specific Mla alleles. The linkage order established is Hor1-Mla6-Mla13-Mla14-Hor2. The genetic distances between Hor1-Mla6, Mla6-Mla13, and Mla13-Hor2, obtained using Mapmaker 3.0b F3 intercross analysis, are 3.9, 0.2, and 5.2 cM, respectively.

Additional References

The Mla (powdery mildew) resistance cluster is associated with three NBS-LRR gene families and suppressed recombination within a 240-kb DNA interval on chromosome 5S (1HS) of barley. (1999) (<https://pubmed.ncbi.nlm.nih.gov/10581297>)

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>)

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

3 (Mla13, Mla6, MLO) (<https://www.gephebase.org/search-criteria?/or+Taxon+ID=~4513~/and+Trait=Pathogen+resistance/and+groupHaplotypes=true#gephebase-summary-title>)

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS