

GEPHE SUMMARY

ALMT1 (https://www.gephebase.org/search-criteria/?and+Gene Gephebase=%ALMT1%#gephebase-summary-title)	Gephebase Gene	GP00000080	GepheID
Published	Entry Status	Martin	Main curator

PHENOTYPIC CHANGE

	Trait Category		
Physiology (https://www.gephebase.org/search-criteria/?and+Trait+Category=%Physiology%#gephebase-summary-title)	Trait		
Metal tolerance (https://www.gephebase.org/search-criteria/?and+Trait=%Metal+tolerance%#gephebase-summary-title)	Trait State in Taxon A		
Triticum aestivum	Trait State in Taxon B		
Triticum aestivum	Ancestral State		
Data not curated	Taxonomic Status		
Domesticated (https://www.gephebase.org/search-criteria/?and+Taxonomic+Status=%Domesticated%#gephebase-summary-title)			
Taxon A	Latin Name	Taxon B	Latin Name
Triticum aestivum (https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=%Triticum+aestivum%#gephebase-summary-title)		Triticum aestivum (https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=%Triticum+aestivum%#gephebase-summary-title)	
bread wheat	Common Name	bread wheat	Common Name
	Synonyms		Synonyms
Triticum aestivum subsp. aestivum; Triticum vulgare; bread wheat; Canadian hard winter wheat; common wheat; wheat; Triticum aestivum L.; Triticum vulgare L.; Triticum vulgare Vill., nom. illeg.; Tricum aestivum; Triticum aestivam; Triticum aestivum8		Triticum aestivum subsp. aestivum; Triticum vulgare; bread wheat; Canadian hard winter wheat; common wheat; wheat; Triticum aestivum L.; Triticum vulgare L.; Triticum vulgare Vill., nom. illeg.; Tricum aestivum; Triticum aestivam; Triticum aestivum8	
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		cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Pooideae; Triticodae; Triticeae; Triticinae; Triticum	
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
4565 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4565)	NCBI Taxonomy ID	4565 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4565)	NCBI Taxonomy ID
No	is Taxon A an Infraspecies?	No	is Taxon B an Infraspecies?

GENOTYPIC CHANGE

ALMT1	Generic Gene Name	UniProtKB Triticum aestivum
ALMT1-1; ALMT1-2	Synonyms	GenebankID or UniProtKB
-	String	DQ072270 (https://www.ncbi.nlm.nih.gov/nuccore/DQ072270)
Belongs to the aromatic acid exporter (TC 2.A.85) family.	Sequence Similarities	
-	GO - Molecular Function	
GO:0015743 : malate transport (https://www.ebi.ac.uk/QuickGO/term/GO:0015743)	GO - Biological Process	
GO:0016021 : integral component of membrane (https://www.ebi.ac.uk/QuickGO/term/GO:0016021)	GO - Cellular Component	
GO:0005886 : plasma membrane (https://www.ebi.ac.uk/QuickGO/term/GO:0005886)		

No (https://www.gephebase.org/search-criteria/?and+Presumptive+Null=%No%#gephebase-summary-title)	Presumptive Null
Cis-regulatory (https://www.gephebase.org/search-criteria/?and+Molecular+Type=%Cis-regulatory%#gephebase-summary-title)	Molecular Type
Unknown (https://www.gephebase.org/search-criteria/?and+Aberration+Type=%Unknown%#gephebase-summary-title)	Aberration Type
multiple regulatory changes	Molecular Details of the Mutation
Linkage Mapping (https://www.gephebase.org/search-criteria/?and+Experimental+Evidence=%Linkage+Mapping%#gephebase-summary-title)	Experimental Evidence
Molecular characterization and mapping of ALMT1, the aluminium-tolerance gene of bread wheat (<i>Triticum aestivum</i> L.). (2005) (https://pubmed.ncbi.nlm.nih.gov/16391684)	Main Reference
Raman H; Zhang K; Cakir M; Appels R; Garvin DF; Maron LG; Kochian LV; Moroni JS; Raman R; Imtiaz M; Drake-Brockman F; Waters I; Martin P; Sasaki T; Yamamoto Y; Matsumoto H; Hebb DM; Delhaize E; Ryan PR	Authors
The major aluminum (Al) tolerance gene in wheat ALMT1 confers. An Al-activated efflux of malate from root apices. We determined the genomic structure of the ALMT1 gene and found it consists of 6 exons interrupted by 5 introns. Sequencing a range of wheat genotypes identified 3 alleles for ALMT1, 1 of which was identical to the ALMT1 gene from an Aegilops tauschii accession. The ALMT1 gene was mapped to chromosome 4DL using 'Chinese Spring' deletion lines, and loss of ALMT1 coincided with the loss of both Al tolerance and Al-activated malate efflux. Aluminium tolerance in each of 5 different doubled-haploid populations was found to be conditioned by a single major gene. When ALMT1 was polymorphic between the parental lines, QTL and linkage analyses indicated that ALMT1 mapped to chromosome 4DL and cosegregated with Al tolerance. In 2 populations examined, Al tolerance also segregated with a greater capacity for Al-activated malate efflux. Aluminium tolerance was not associated with a particular coding allele for ALMT1, but was significantly correlated with the relative level of ALMT1 expression. These findings suggest that the Al tolerance in a diverse range of wheat genotypes is primarily conditioned by ALMT1.	Abstract
	Additional References
Quantitative trait loci for aluminum resistance in Chinese wheat landrace FSW. (2008) (https://pubmed.ncbi.nlm.nih.gov/18379752)	
The multiple origins of aluminium resistance in hexaploid wheat include Aegilops tauschii and more recent cis mutations to TaALMT1. (2010) (https://pubmed.ncbi.nlm.nih.gov/20804458)	

RELATED GEPHE

No matches found.	Related Genes
No matches found.	Related Haplotypes

EXTERNAL LINKS

COMMENTS