

GEPHE SUMMARY

	Gephebase Gene	GepheID
Flowering locus T (=TaFT=VRN3) (<a +flowering+locus+t+(='TaFT=VRN3)^#gephebase-summary-title"' href="https://www.gephebase.org/search-criteria?/and+GeneGephebase=">https://www.gephebase.org/search-criteria?/and+GeneGephebase="+Flowering+locus+T+(=TaFT=VRN3)^#gephebase-summary-title)	GP00000344	
	Entry Status	Main curator
Published	Martin	

PHENOTYPIC CHANGE

	Trait Category		
Physiology (<a +physiology^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+TraitCategory=">https://www.gephebase.org/search-criteria?/and+TraitCategory="+Physiology^#gephebase-summary-title)			
	Trait		
Flowering time (<a +flowering+time^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait=">https://www.gephebase.org/search-criteria?/and+Trait="+Flowering+time^#gephebase-summary-title)			
	Trait State in Taxon A		
Triticum aestivum			
	Trait State in Taxon B		
Triticum aestivum			
	Ancestral State		
Taxon A			
	Taxonomic Status		
Domesticated (<a +domesticated^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+TaxonomicStatus=">https://www.gephebase.org/search-criteria?/and+TaxonomicStatus="+Domesticated^#gephebase-summary-title)			
	Taxon A		Taxon B
	Latin Name		Latin Name
Triticum aestivum (<a +triticum+aestivum^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Triticum+aestivum^#gephebase-summary-title)			Triticum aestivum (<a +triticum+aestivum^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Triticum+aestivum^#gephebase-summary-title)
	Common Name		Common Name
bread wheat			bread wheat
	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
	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; 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
	Parent		Parent
Triticum () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4564)			Triticum () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4564)
	NCBI Taxonomy ID		NCBI Taxonomy ID
4565 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4565)			4565 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4565)
	is Taxon A an Intraspecies?		is Taxon B an Intraspecies?
No			No

GENOTYPIC CHANGE

	Generic Gene Name	UniProtKB Arabidopsis thaliana
FT		Q9SXZ2 (http://www.uniprot.org/uniprot/Q9SXZ2)
	Synonyms	GenebankID or UniProtKB
F5l14.3; F5l14_3; FLOWERING LOCUS T; REDUCED STEM BRANCHING 8; RSB8; At1g65480		ABV59396 (https://www.ncbi.nlm.nih.gov/nuccore/ABV59396)
	String	
3702.AT1G65480.1 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=3702.AT1G65480.1)		
	Sequence Similarities	
Belongs to the phosphatidylethanolamine-binding protein family.		
	GO - Molecular Function	
GO:0008429 : phosphatidylethanolamine binding (https://www.ebi.ac.uk/QuickGO/term/GO:0008429)		
	GO - Biological Process	
GO:0030154 : cell differentiation (https://www.ebi.ac.uk/QuickGO/term/GO:0030154)		

GO:0009911 : positive regulation of flower development
(<https://www.ebi.ac.uk/QuickGO/term/GO:0009911>)
GO:0009908 : flower development (<https://www.ebi.ac.uk/QuickGO/term/GO:0009908>)
GO:0009909 : regulation of flower development
(<https://www.ebi.ac.uk/QuickGO/term/GO:0009909>)
GO:0048573 : photoperiodism, flowering
(<https://www.ebi.ac.uk/QuickGO/term/GO:0048573>)
GO:0010119 : regulation of stomatal movement
(<https://www.ebi.ac.uk/QuickGO/term/GO:0010119>)

GO - Cellular Component

GO:0005737 : cytoplasm (<https://www.ebi.ac.uk/QuickGO/term/GO:0005737>)
GO:0005634 : nucleus (<https://www.ebi.ac.uk/QuickGO/term/GO:0005634>)
GO:0005783 : endoplasmic reticulum
(<https://www.ebi.ac.uk/QuickGO/term/GO:0005783>)

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
Insertion (https://www.gephebase.org/search-criteria?/and+Aberration Type=~Insertion~#gephebase-summary-title)	Aberration Type
1-10 kb	Insertion Size
Retrotransposition in promoter region	Molecular Details of the Mutation
Linkage Mapping (https://www.gephebase.org/search-criteria?/and+Experimental Evidence=~Linkage Mapping~#gephebase-summary-title)	Experimental Evidence
The wheat and barley vernalization gene VRN3 is an orthologue of FT. (2006) (https://pubmed.ncbi.nlm.nih.gov/17158798)	Main Reference
Yan L; Fu D; Li C; Blechl A; Tranquilli G; Bonafede M; Sanchez A; Valarik M; Yasuda S; Dubcovsky J	Authors

Abstract

Winter wheat and barley varieties require an extended exposure to low temperatures to accelerate flowering (vernalization), whereas spring varieties do not have this requirement. In this study, we show that in these species, the vernalization gene VRN3 is linked completely to a gene similar to Arabidopsis FLOWERING LOCUS T (FT). FT induction in the leaves results in a transmissible signal that promotes flowering. Transcript levels of the barley and wheat orthologues, designated as HvFT and TaFT, respectively, are significantly higher in plants homozygous for the dominant Vrn3 alleles (early flowering) than in plants homozygous for the recessive vrn3 alleles (late flowering). In wheat, the dominant Vrn3 allele is associated with the insertion of a retroelement in the TaFT promoter, whereas in barley, mutations in the HvFT first intron differentiate plants with dominant and recessive VRN3 alleles. Winter wheat plants transformed with the TaFT allele carrying the promoter retroelement insertion flowered significantly earlier than nontransgenic plants, supporting the identity between TaFT and VRN-B3. Statistical analyses of flowering times confirmed the presence of significant interactions between vernalization and FT allelic classes in both wheat and barley ($P < 0.0001$). These interactions were supported further by the observed up-regulation of HvFT transcript levels by vernalization in barley winter plants ($P = 0.002$). These results confirmed that the wheat and barley FT genes are responsible for natural allelic variation in vernalization requirement, providing additional sources of adaptive diversity to these economically important crops.

Additional References

RELATED GEPHE

1 (VRN1) (https://www.gephebase.org/search-criteria?/or+Taxon ID=~4565~/and+Trait=Flowering time/and+groupHaplotypes=true#gephebase-summary-title)	Related Genes
No matches found.	Related Haplotypes

EXTERNAL LINKS

COMMENTS

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