

GEPHE SUMMARY

|                                                                                                                                                                                                                                                                                                   |                |              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|--------------|
|                                                                                                                                                                                                                                                                                                   | Gephebase Gene | GepheID      |
| Flowering locus T (=HvFT=VRN3) ( <a +flowering+locus+t+(='HvFT=VRN3)^#gephebase-summary-title"' href="https://www.gephebase.org/search-criteria?/and+GeneGephebase=">https://www.gephebase.org/search-criteria?/and+GeneGephebase="+Flowering+locus+T+(=HvFT=VRN3)^#gephebase-summary-title</a> ) | GP00000343     |              |
|                                                                                                                                                                                                                                                                                                   | 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</a> )                                                       |                             |                                                                                                                                                                                                                                                                                              |                             |
|                                                                                                                                                                                                                                                                                              | 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</a> )                                                           |                             |                                                                                                                                                                                                                                                                                              |                             |
|                                                                                                                                                                                                                                                                                              | Trait State in Taxon A      |                                                                                                                                                                                                                                                                                              |                             |
| Hordeum vulgare                                                                                                                                                                                                                                                                              |                             |                                                                                                                                                                                                                                                                                              |                             |
|                                                                                                                                                                                                                                                                                              | Trait State in Taxon B      |                                                                                                                                                                                                                                                                                              |                             |
| Hordeum vulgare                                                                                                                                                                                                                                                                              |                             |                                                                                                                                                                                                                                                                                              |                             |
|                                                                                                                                                                                                                                                                                              | Ancestral State             |                                                                                                                                                                                                                                                                                              |                             |
| Data not curated                                                                                                                                                                                                                                                                             |                             |                                                                                                                                                                                                                                                                                              |                             |
|                                                                                                                                                                                                                                                                                              | 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</a> )                                             |                             |                                                                                                                                                                                                                                                                                              |                             |
|                                                                                                                                                                                                                                                                                              |                             |                                                                                                                                                                                                                                                                                              |                             |
|                                                                                                                                                                                                                                                                                              | Taxon A                     |                                                                                                                                                                                                                                                                                              | Taxon B                     |
|                                                                                                                                                                                                                                                                                              | Latin Name                  |                                                                                                                                                                                                                                                                                              | Latin Name                  |
| Hordeum vulgare<br>( <a +hordeum+vulgare^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Hordeum+vulgare^#gephebase-summary-title</a> )                           |                             | Hordeum vulgare<br>( <a +hordeum+vulgare^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Hordeum+vulgare^#gephebase-summary-title</a> )                           |                             |
|                                                                                                                                                                                                                                                                                              | 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)<br>( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4512">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4512</a> )                                                                                                            |                             | Hordeum () - (Rank: genus)<br>( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4512">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4512</a> )                                                                                                            |                             |
|                                                                                                                                                                                                                                                                                              | NCBI Taxonomy ID            |                                                                                                                                                                                                                                                                                              | NCBI Taxonomy ID            |
| 4513<br>( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4513">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4513</a> )                                                                                                                                  |                             | 4513<br>( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4513">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4513</a> )                                                                                                                                  |                             |
|                                                                                                                                                                                                                                                                                              | is Taxon A an Intraspecies? |                                                                                                                                                                                                                                                                                              | is Taxon B an Intraspecies? |
| No                                                                                                                                                                                                                                                                                           |                             | No                                                                                                                                                                                                                                                                                           |                             |

GENOTYPIC CHANGE

|                                                                                                                                                                                                                     |                         |                                                                                                                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                     | Generic Gene Name       | UniProtKB Arabidopsis thaliana                                                                                         |
| FT                                                                                                                                                                                                                  |                         | Q9SXZ2 ( <a href="http://www.uniprot.org/uniprot/Q9SXZ2">http://www.uniprot.org/uniprot/Q9SXZ2</a> )                   |
|                                                                                                                                                                                                                     | Synonyms                | GenebankID or UniProtKB                                                                                                |
| F5l14.3; F5l14_3; FLOWERING LOCUS T; REDUCED STEM BRANCHING 8; RSB8; At1g65480                                                                                                                                      |                         | ABV59396 ( <a href="https://www.ncbi.nlm.nih.gov/nuccore/ABV59396">https://www.ncbi.nlm.nih.gov/nuccore/ABV59396</a> ) |
|                                                                                                                                                                                                                     | String                  |                                                                                                                        |
| 3702.AT1G65480.1<br>( <a href="http://string-db.org/newstring_cgi/show_network_section.pl?identifier=3702.AT1G65480.1">http://string-db.org/newstring_cgi/show_network_section.pl?identifier=3702.AT1G65480.1</a> ) |                         |                                                                                                                        |
|                                                                                                                                                                                                                     | Sequence Similarities   |                                                                                                                        |
| Belongs to the phosphatidylethanolamine-binding protein family.                                                                                                                                                     |                         |                                                                                                                        |
|                                                                                                                                                                                                                     | GO - Molecular Function |                                                                                                                        |
| GO:0008429 : phosphatidylethanolamine binding<br>( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0008429">https://www.ebi.ac.uk/QuickGO/term/GO:0008429</a> )                                                      |                         |                                                                                                                        |
|                                                                                                                                                                                                                     | GO - Biological Process |                                                                                                                        |
| GO:0030154 : cell differentiation ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0030154">https://www.ebi.ac.uk/QuickGO/term/GO:0030154</a> )                                                                     |                         |                                                                                                                        |
| GO:0009911 : positive regulation of flower development<br>( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0009911">https://www.ebi.ac.uk/QuickGO/term/GO:0009911</a> )                                             |                         |                                                                                                                        |

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>)

|                                                                                                                                                                                                                                                                          |                                   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
|                                                                                                                                                                                                                                                                          | Presumptive Null                  |
| No ( <a +no`#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Presumptive Null=">https://www.gephebase.org/search-criteria?/and+Presumptive Null="+No`#gephebase-summary-title</a> )                                                     |                                   |
|                                                                                                                                                                                                                                                                          | Molecular Type                    |
| Cis-regulatory ( <a +cis-regulatory`#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Molecular Type=">https://www.gephebase.org/search-criteria?/and+Molecular Type="+Cis-regulatory`#gephebase-summary-title</a> )                     |                                   |
|                                                                                                                                                                                                                                                                          | Aberration Type                   |
| Unknown ( <a +unknown`#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Aberration Type=">https://www.gephebase.org/search-criteria?/and+Aberration Type="+Unknown`#gephebase-summary-title</a> )                                        |                                   |
|                                                                                                                                                                                                                                                                          | Molecular Details of the Mutation |
| Regulatory variation in first intron                                                                                                                                                                                                                                     |                                   |
|                                                                                                                                                                                                                                                                          | Experimental Evidence             |
| Linkage Mapping ( <a +linkage="" href="https://www.gephebase.org/search-criteria?/and+Experimental Evidence=" mapping`#gephebase-summary-title"="">https://www.gephebase.org/search-criteria?/and+Experimental Evidence="+Linkage Mapping`#gephebase-summary-title</a> ) |                                   |
|                                                                                                                                                                                                                                                                          | Main Reference                    |
| The wheat and barley vernalization gene VRN3 is an orthologue of FT. (2006) ( <a href="https://pubmed.ncbi.nlm.nih.gov/17158798">https://pubmed.ncbi.nlm.nih.gov/17158798</a> )                                                                                          |                                   |
|                                                                                                                                                                                                                                                                          | Authors                           |
| Yan L; Fu D; Li C; Blechl A; Tranquilli G; Bonafede M; Sanchez A; Valarik M; Yasuda S; Dubcovsky J                                                                                                                                                                       |                                   |

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

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Related Genes      |
| 6 (CENTRORADIALIS (HvCEN), EARLY FLOWERING 3 (here = Mat-a), EARLY FLOWERING 3/ EARLY MATURITY 8, EARLY FLOWERING 3/ EARLYMATURITY8, PRR37-like Photoperiod-H1 (Ppd-H1), VRN2) ( <a +4513`="" and+grouphaplotypes='true#gephebase-summary-title"' and+trait="Flowering" href="https://www.gephebase.org/search-criteria?/or+Taxon ID=" time="">https://www.gephebase.org/search-criteria?/or+Taxon ID="+4513`/and+Trait=Flowering time/and+groupHaplotypes=true#gephebase-summary-title</a> ) |                    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Related Haplotypes |
| No matches found.                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                    |

EXTERNAL LINKS

COMMENTS