

GEPHE SUMMARY

Gephebase Gene		GepheID
FLC (Flowering Locus C) (https://www.gephebase.org/search-criteria?/and+Gene)	GP00000334	
Gephebase="^FLC (Flowering Locus C)^#gephebase-summary-title)		Main curator
Published	Entry Status	Martin

PHENOTYPIC CHANGE

Trait Category	
Physiology (https://www.gephebase.org/search-criteria?/and+Trait)	
Category="^Physiology^#gephebase-summary-title)	Trait
Flowering time (https://www.gephebase.org/search-criteria?/and+Trait)	
time="^Flowering	Trait State in Taxon A
time^#gephebase-summary-title)	Arabidopsis thaliana- Col0/Ler0
	Trait State in Taxon B
	Arabidopsis thaliana- Lz-0
	Ancestral State
Data not curated	Taxonomic Status
Intraspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic)	
Status="^Intraspecific^#gephebase-summary-title)	

Taxon A		Taxon B	
	Latin Name		Latin Name
Arabidopsis thaliana	Arabidopsis thaliana	Arabidopsis thaliana	Arabidopsis thaliana
(https://www.gephebase.org/search-criteria?/and+Taxon)			
thaliana^#gephebase-summary-title)	thaliana^#gephebase-summary-title)	thaliana^#gephebase-summary-title)	thaliana^#gephebase-summary-title)
	Common Name		Common Name
thale cress	thale cress	thale cress	thale cress
	Synonyms		Synonyms
thale cress; mouse-ear cress; thale-cress; Arabidopsis thaliana (L.) Heynh.; Arabidopsis thaliana (thale cress); Arabidopsis_thaliana; Arbisopsis thaliana; thale kress	thale cress; mouse-ear cress; thale-cress; Arabidopsis thaliana (L.) Heynh.; Arabidopsis thaliana (thale cress); Arabidopsis_thaliana; Arbisopsis thaliana; thale kress	thale cress; mouse-ear cress; thale-cress; Arabidopsis thaliana (L.) Heynh.; Arabidopsis thaliana (thale cress); Arabidopsis_thaliana; Arbisopsis thaliana; thale kress	thale cress; mouse-ear cress; thale-cress; Arabidopsis thaliana (L.) Heynh.; Arabidopsis thaliana (thale cress); Arabidopsis_thaliana; Arbisopsis thaliana; thale kress
	Rank		Rank
species	species	species	species
	Lineage		Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; malvids; Brassicales; Brassicaceae; Camelineae; Arabidopsis	cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; malvids; Brassicales; Brassicaceae; Camelineae; Arabidopsis	cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; malvids; Brassicales; Brassicaceae; Camelineae; Arabidopsis	cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; malvids; Brassicales; Brassicaceae; Camelineae; Arabidopsis
	Parent		Parent
Arabidopsis () - (Rank: genus)			
(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3701)			
3702	3702	3702	3702
(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3702)			
	is Taxon A an Intraspecies?		is Taxon B an Intraspecies?
Yes	Yes	Yes	Yes
	Taxon A Description		Taxon B Description
Arabidopsis thaliana- Col0/Ler0	Arabidopsis thaliana- Lz-0	Arabidopsis thaliana- Lz-0	Arabidopsis thaliana- Lz-0

GENOTYPIC CHANGE

Generic Gene Name		UniProtKB Arabidopsis thaliana
FLC	Q9S7Q7 (http://www.uniprot.org/uniprot/Q9S7Q7)	
	Synonyms	GenebankID or UniProtKB
AGAMOUS-like 25; AGL25; FLF; FLOWERING LOCUS C; FLOWERING LOCUS F; MADS BOX PROTEIN FLOWERING LOCUS F; REDUCED STEM BRANCHING 6; RSB6; T31P16.130; T31P16_130; At5g10140	AF116528 (https://www.ncbi.nlm.nih.gov/nucleotide/AF116528)	
	String	
3702.AT5G10140.1		
(http://string-db.org/newstring.cgi/show_network_section.pl?identifier=3702.AT5G10140.1)		
	Sequence Similarities	
-		
	GO - Molecular Function	
GO:0046983 : protein dimerization activity		
(https://www.ebi.ac.uk/QuickGO/term/GO:0046983)		

GO:0003700 : DNA-binding transcription factor activity
(<https://www.ebi.ac.uk/QuickGO/term/GO:0003700>)
GO:0000977 : RNA polymerase II regulatory region sequence-specific DNA binding
(<https://www.ebi.ac.uk/QuickGO/term/GO:0000977>)
GO:0043565 : sequence-specific DNA binding
(<https://www.ebi.ac.uk/QuickGO/term/GO:0043565>)
GO:0008134 : transcription factor binding
(<https://www.ebi.ac.uk/QuickGO/term/GO:0008134>)
GO:0000982 : transcription factor activity, RNA polymerase II proximal promoter
sequence-specific DNA binding (<https://www.ebi.ac.uk/QuickGO/term/GO:0000982>)
GO:0044212 : transcription regulatory region DNA binding
(<https://www.ebi.ac.uk/QuickGO/term/GO:0044212>)

GO - Biological Process

GO:0007275 : multicellular organism development
(<https://www.ebi.ac.uk/QuickGO/term/GO:0007275>)
GO:0045944 : positive regulation of transcription by RNA polymerase II
(<https://www.ebi.ac.uk/QuickGO/term/GO:0045944>)
GO:0030154 : cell differentiation (<https://www.ebi.ac.uk/QuickGO/term/GO:0030154>)
GO:0009908 : flower development (<https://www.ebi.ac.uk/QuickGO/term/GO:0009908>)
GO:0009910 : negative regulation of flower development
(<https://www.ebi.ac.uk/QuickGO/term/GO:0009910>)
GO:0042752 : regulation of circadian rhythm
(<https://www.ebi.ac.uk/QuickGO/term/GO:0042752>)
GO:0009266 : response to temperature stimulus
(<https://www.ebi.ac.uk/QuickGO/term/GO:0009266>)
GO:0010048 : vernalization response
(<https://www.ebi.ac.uk/QuickGO/term/GO:0010048>)

GO - Cellular Component

GO:0005634 : nucleus (<https://www.ebi.ac.uk/QuickGO/term/GO:0005634>)

Presumptive Null

Unknown (<https://www.gephebase.org/search-criteria?/and+Presumptive Null=~Unknown^#gephebase-summary-title>)

Molecular Type

Cis-regulatory (<https://www.gephebase.org/search-criteria?/and+Molecular Type=~Cis-regulatory^#gephebase-summary-title>)

Aberration Type

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

Molecular Details of the Mutation

unknown

Experimental Evidence

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

Main Reference

FRIGIDA-independent variation in flowering time of natural *Arabidopsis thaliana* accessions. (2005) (<https://pubmed.ncbi.nlm.nih.gov/15911588>)

Authors

Werner JD; Borevitz JO; Uhlenhaut NH; Ecker JR; Chory J; Weigel D

Abstract

FRIGIDA (FRI) and FLOWERING LOCUS C (FLC) are two genes that, unless plants are vernalized, greatly delay flowering time in *Arabidopsis thaliana*. Natural loss-of-function mutations in FRI cause the early flowering growth habits of many *A. thaliana* accessions. To quantify the variation among wild accessions due to FRI, and to identify additional genetic loci in wild accessions that influence flowering time, we surveyed the flowering times of 145 accessions in long-day photoperiods, with and without a 30-day vernalization treatment, and genotyped them for two common natural lesions in FRI. FRI is disrupted in at least 84 of the accessions, accounting for only approximately 40% of the flowering-time variation in long days. During efforts to dissect the causes for variation that are independent of known dysfunctional FRI alleles, we found new loss-of-function alleles in FLC, as well as late-flowering alleles that do not map to FRI or FLC. An FLC nonsense mutation was found in the early flowering Van-0 accession, which has otherwise functional FRI. In contrast, Lz-0 flowers late because of high levels of FLC expression, even though it has a deletion in FRI. Finally, eXtreme array mapping identified genomic regions linked to the vernalization-independent, late-flowering habit of Bur-0, which has an alternatively spliced FLC allele that behaves as a null allele.

Additional References

Adaptive divergence in flowering time among natural populations of *Arabidopsis thaliana*: Estimates of selection and QTL mapping. (2017) (<https://pubmed.ncbi.nlm.nih.gov/27859214>)

RELATED GEPHE

Related Genes

12 (AGAMOUS-LIKE 50, Cryptochrome 2 (CRY2) ED1 allele, EARLY FLOWERING 3(ELF3), FLM (MAF1), Flowering locus T (FT), Frigida (FRI), Frigida like 1 (FRL1), Frigida like 2 (FRL2), MADS AFFECTING FLOWERING 2 (MAF2), SVP (SHORT VEGETATIVE PHASE), VIN3, HUA2) (<https://www.gephebase.org/search-criteria?/or+Taxon ID=~3702^/and+Trait=Flowering time/and+groupHaplotypes=true#gephebase-summary-title>)

Related Haplotypes

6 ([https://www.gephebase.org/search-criteria?/or+Gene Gephebase=~FLC \(Flowering Locus C\)^/and+Taxon ID=~3702^/or+Gene Gephebase=~FLC \(Flowering Locus C\)^/and+Taxon ID=~3702^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Gene Gephebase=~FLC (Flowering Locus C)^/and+Taxon ID=~3702^/or+Gene Gephebase=~FLC (Flowering Locus C)^/and+Taxon ID=~3702^#gephebase-summary-title))

EXTERNAL LINKS

COMMENTS

