

GEPHE SUMMARY

	Gephebase Gene		GepheID
CmWIP1 (https://www.gephebase.org/search-criteria?/and+GeneGephebase=~CmWIP1~#gephebase-summary-title)		GP00000188	
	Entry Status	Martin	Main curator
Published			

PHENOTYPIC CHANGE

	Trait Category		
Physiology (https://www.gephebase.org/search-criteria?/and+TraitCategory=~Physiology~#gephebase-summary-title)			
	Trait		
Flower sex determination (female vs. hermaphrodite) (https://www.gephebase.org/search-criteria?/and+Trait=~Flower sex determination (female vs. hermaphrodite)~#gephebase-summary-title)			
	Trait State in Taxon A		
Cucumis melo - monoecious			
	Trait State in Taxon B		
Cucumis melo - gynoeious			
	Ancestral State		
Taxon A			
	Taxonomic Status		
Domesticated (https://www.gephebase.org/search-criteria?/and+TaxonomicStatus=~Domesticated~#gephebase-summary-title)			
Taxon A		Taxon B	
	Latin Name		Latin Name
Cucumis melo (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=~Cucumis melo~#gephebase-summary-title)		Cucumis melo (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=~Cucumis melo~#gephebase-summary-title)	
	Common Name		Common Name
muskmelon		muskmelon	
	Synonyms		Synonyms
muskmelon; Oriental melon; Cucumis melo L., 1753; Cucumis melo var. markuwa Markino; Cucurbita melo L.		muskmelon; Oriental melon; Cucumis melo L., 1753; Cucumis melo var. markuwa Markino; Cucurbita melo L.	
	Rank		Rank
species		species	
	Lineage		Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; fabids; Cucurbitales; Cucurbitaceae; Benincaseae; Cucumis		cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; fabids; Cucurbitales; Cucurbitaceae; Benincaseae; Cucumis	
	Parent		Parent
Cucumis () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 3655)		Cucumis () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 3655)	
	NCBI Taxonomy ID		NCBI Taxonomy ID
3656 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 3656)		3656 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 3656)	
	is Taxon A an Intraspecies?		is Taxon B an Intraspecies?
No		No	

GENOTYPIC CHANGE

	Generic Gene Name		UniProtKB Arabidopsis thaliana
WIP1		Q8GXA4 (http://www.uniprot.org/uniprot/Q8GXA4)	
	Synonyms		GenebankID or UniProtKB
Arabidopsis thaliana WPP domain interacting protein 1; AtWIP1; WPP domain interacting protein 1; At4g26455; M3E9.120		ACX85637 (https://www.ncbi.nlm.nih.gov/nuccore/ACX85637)	
	String		
3702.AT4G26455.1 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier= 3702.AT4G26455.1)			
	Sequence Similarities		
-			
	GO - Molecular Function		
GO:0046982 : protein heterodimerization activity (https://www.ebi.ac.uk/QuickGO/term/GO:0046982)			
	GO - Biological Process		
GO:0006997 : nucleus organization (https://www.ebi.ac.uk/QuickGO/term/GO:0006997)			

GO:0016021 : integral component of membrane (https://www.ebi.ac.uk/QuickGO/term/GO:0016021) GO:0009504 : cell plate (https://www.ebi.ac.uk/QuickGO/term/GO:0009504) GO:0005635 : nuclear envelope (https://www.ebi.ac.uk/QuickGO/term/GO:0005635) GO:0031965 : nuclear membrane (https://www.ebi.ac.uk/QuickGO/term/GO:0031965)	
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
Promoter insertion of a Transcription Factor Binding Site allowing propagation of heritable methylation	Molecular Details of the Mutation
Linkage Mapping (https://www.gephebase.org/search-criteria?/and+Experimental Evidence=~Linkage Mapping~#gephebase-summary-title)	Experimental Evidence
A transposon-induced epigenetic change leads to sex determination in melon. (2009) (https://pubmed.ncbi.nlm.nih.gov/19847267)	Main Reference
Martin A; Troadec C; Boualem A; Rajab M; Fernandez R; Morin H; Pitrat M; Dogimont C; Bendahmane A	Authors
Sex determination in plants leads to the development of unisexual flowers from an originally bisexual floral meristem. This mechanism results in the enhancement of outcrossing and promotes genetic variability, the consequences of which are advantageous to the evolution of a species. In melon, sexual forms are controlled by identity of the alleles at the andromonoecious (a) and gynoecious (g) loci. We previously showed that the a gene encodes an ethylene biosynthesis enzyme, CmACS-7, that represses stamen development in female flowers. Here we show that the transition from male to female flowers in gynoecious lines results from epigenetic changes in the promoter of a transcription factor, CmWIP1. This natural and heritable epigenetic change resulted from the insertion of a transposon, which is required for initiation and maintenance of the spreading of DNA methylation to the CmWIP1 promoter. Expression of CmWIP1 leads to carpel abortion, resulting in the development of unisexual male flowers. Moreover, we show that CmWIP1 indirectly represses the expression of the andromonoecious gene, CmACS-7, to allow stamen development. Together our data indicate a model in which CmACS-7 and CmWIP1 interact to control the development of male, female and hermaphrodite flowers in melon.	Abstract
	Additional References

RELATED GEPHE

1 (CmACS-7) (https://www.gephebase.org/search-criteria?/or+Taxon ID=~3656~/and+Trait=Flower sex determination/and+groupHaplotypes=true#gephebase-summary-title)	Related Genes
No matches found.	Related Haplotypes

EXTERNAL LINKS

COMMENTS

@TE @Epigenetics