

## GEPHE SUMMARY

	Gephebase Gene	GephelD
ODORANT1 [pseudo-replication between 2 ODO1 entries due to possible homology between alleles] ( <a href="https://www.gephebase.org/search-criteria/?and+Gene">https://www.gephebase.org/search-criteria/?and+Gene</a> )	GP00000751	
Gephebase=^ODORANT1 [pseudo-replication between 2 ODO1 entries due to possible homology between alleles]^#gephebase-summary-title)	Martin	Main curator
	Entry Status	
Published		

## PHENOTYPIC CHANGE

	Trait Category	
Physiology ( <a href="https://www.gephebase.org/search-criteria/?and+Trait">https://www.gephebase.org/search-criteria/?and+Trait</a> )		
Category=^Physiology^#gephebase-summary-title)		
	Trait	
Fragrance ( <a href="https://www.gephebase.org/search-criteria/?and+Trait=^Fragrance^#gephebase-summary-title">https://www.gephebase.org/search-criteria/?and+Trait=^Fragrance^#gephebase-summary-title</a> )		
	Trait State in Taxon A	
Petunia hybrida - R27 (scentless)		
	Trait State in Taxon B	
Petunia hybrida - Mitchell (odorant)		
	Ancestral State	
Data not curated		
	Taxonomic Status	
Domesticated ( <a href="https://www.gephebase.org/search-criteria/?and+Taxonomic">https://www.gephebase.org/search-criteria/?and+Taxonomic</a> )		
Status=^Domesticated^#gephebase-summary-title)		
Taxon A		Taxon B
	Latin Name	Latin Name
Petunia x hybrida	Petunia x hybrida	
( <a href="https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=^Petunia+x+hybrida^#gephebase-summary-title">https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=^Petunia+x+hybrida^#gephebase-summary-title</a> )	( <a href="https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=^Petunia+x+hybrida^#gephebase-summary-title">https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=^Petunia+x+hybrida^#gephebase-summary-title</a> )	
	Common Name	Common Name
-	-	
	Synonyms	Synonyms
Petunia axillaris X Petunia integrifolia; Petunia hybrida; garden petunia; Petunia x hybrida hort. ex E.Vilm., 1863	Petunia axillaris X Petunia integrifolia; Petunia hybrida; garden petunia; Petunia x hybrida hort. ex E.Vilm., 1863	
	Rank	Rank
species	species	
	Lineage	Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; asterids; lamiids; Solanales; Solanaceae; Petunioideae; Petunia	cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; asterids; lamiids; Solanales; Solanaceae; Petunioideae; Petunia	
	Parent	Parent
Petunia () - (Rank: genus)	Petunia () - (Rank: genus)	
( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4101">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4101</a> )	( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4101">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4101</a> )	NCBI Taxonomy ID
4102	4102	NCBI Taxonomy ID
( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4102">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4102</a> )	( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4102">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4102</a> )	
is Taxon A an Infraspecies?	is Taxon B an Infraspecies?	
Yes	Yes	
	Taxon A Description	Taxon B Description
Petunia hybrida - R27 (scentless)	Petunia hybrida - Mitchell (odorant)	

## GENOTYPIC CHANGE

	Generic Gene Name	UniProtKB Petunia hybrida
ODO1	Q50EX6 ( <a href="http://www.uniprot.org/uniprot/Q50EX6">http://www.uniprot.org/uniprot/Q50EX6</a> )	
	Synonyms	GenebankID or UniProtKB
-		
	String	
-		
	Sequence Similarities	
-		
	GO - Molecular Function	
GO:0003677 : DNA binding ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0003677">https://www.ebi.ac.uk/QuickGO/term/GO:0003677</a> )		
	GO - Biological Process	
-		
	GO - Cellular Component	
-		

No (<https://www.gephebase.org/search-criteria?/and+Presumptive+Null=^No^#gephebase-summary-title>)

Molecular Type

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

Aberration Type

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

Molecular Details of the Mutation

C/T substitution in enhancer region MYB-TF binding site

Experimental Evidence

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

Main Reference

The transcription factor EMISSION OF BENZENOIDS II activates the MYB ODORANT1 promoter at a MYB binding site specific for fragrant petunias. (2011)  
(<https://pubmed.ncbi.nlm.nih.gov/21585571>)

Authors

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Abstract

Fragrance production in petunia flowers is highly regulated. Two transcription factors, ODORANT1 (ODO1) and EMISSION OF BENZENOIDS II (EOBII) have recently been identified as regulators of the volatile benzenoid/phenylpropanoid pathway in petals. Unlike the non-fragrant Petunia hybrida cultivar R27, the fragrant cultivar Mitchell highly expresses ODO1. Using stable reporter lines, we identified the 1.2-kbp ODO1 promoter from Mitchell that is sufficient for tissue-specific, developmental and rhythmic expression. This promoter fragment can be activated in non-fragrant R27 petals, indicating that the set of trans-acting factors driving ODO1 expression is conserved in these two petunias. Conversely, the 1.2-kbp ODO1 promoter of R27 is much less active in Mitchell petals. Transient transformation of 5' deletion and chimeric Mitchell and R27 ODO1 promoter reporter constructs in petunia petals identified an enhancer region, which is specific for the fragrant Mitchell cultivar and contains a putative MYB binding site (MBS). Mutations in the MBS of the Mitchell promoter decreased overall promoter activity by 50%, highlighting the importance of the enhancer region. We show that EOBII binds and activates the ODO1 promoter via this MBS, establishing a molecular link between these two regulators of floral fragrance biosynthesis in petunia.

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Additional References

## RELATED GEPHE

Related Genes

No matches found.

Related Haplotypes

No matches found.

## EXTERNAL LINKS

## COMMENTS