GEPHE SUMMARY

Gephebase Gene

WDR1 (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^WDR1^#gephebase-summary-title)

GepheID

GP00002093

Entry Status

Published

Main curator

Courtier

PHENOTYPIC CHANGE

Trait Category

Morphology (https://www.gephebase.org/search-criteria?/and+Trait Category=^Morphology^#gephebase-summary-title)

Trait

Coloration (flowers) (https://www.gephebase.org/search-criteria?/and+Trait=^Coloration (flowers)^#gephebase-summary-title)

Trait State in Taxon A

Petunia axillaris

Trait State in Taxon B

Petunia axillaris - white flowers with red and pink revertant spots

Ancestral State

Taxon A

Taxonomic Status

Domesticated (https://www.gephebase.org/search-criteria?/and+Taxonomic Status=^Domesticated^#gephebase-summary-title)

Taxon A

Latin Name

Petunia axillaris (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Petunia axillaris^#gephebase-summary-title)

Common Name

-

Synonyms

large white petunia; white moon petunia; Petunia axillaris (Lam.) Britton, Stern & Poggenb.; Petunia axilliaris

Rank

species

Lineage

cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; asterids; lamiids; Solanales; Solanaceae; Petunioideae; Petunia

Parent

Petunia () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4101)

NCBI Taxonomy ID

33119 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 33119)

is Taxon A an Infraspecies?

No

Taxon B

Latin Name

Petunia axillaris (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Petunia axillaris^#gephebase-summary-title)

Common Name

-

Synonyms

large white petunia; white moon petunia; Petunia axillaris (Lam.) Britton, Stern & Poggenb.; Petunia axilliaris

Rank

species

Lineage

cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; asterids; lamiids; Solanales; Solanaceae; Petunioideae; Petunia

Parent

Petunia () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4101)

NCBI Taxonomy ID

33119 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 33119)

is Taxon B an Infraspecies?

Yes

Taxon B Description

petunia line W138

GENOTYPIC CHANGE

Generic Gene Name

InWDR1

Synonyms

InWDR1

String

-

Sequence Similarities

-

GO - Molecular Function

-

GO - Biological Process

-

GO - Cellular Component

-

UniProtKB Ipomoea nil

Q1JUZ7 (http://www.uniprot.org/uniprot/Q1JUZ7)

GenebankID or UniProtKB

()

Presumptive Null

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

Molecular Type

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

Aberration Type

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

Insertion Size

100-999 bp

Molecular Details of the Mutation

insertion of a 300-bp dTph1 transposon in the WDR gene in the first WD-repeat (321-bp downstream of the transcription start site)

Experimental Evidence

Candidate Gene (https://www.gephebase.org/search-criteria?/and+Experimental Evidence=^Candidate Gene^#gephebase-summary-title)

Main Reference

The an11 locus controlling flower pigmentation in petunia encodes a novel WD-repeat protein conserved in yeast, plants, and animals. (1997) (https://pubmed.ncbi.nlm.nih.gov/9192870)

Authors

de Vetten N; Quattrocchio F; Mol J; Koes R

Abstract

In petunia flowers, the loci an1, an2, and an11 control the pigmentation of the flower by stimulating the transcription of anthocyanin biosynthetic genes. The an1 and an2 locus were recently cloned and encode a basic helix-loop-helix (bHLH) and MYB-domain transcriptional activator, respectively. Here, we report the isolation of the an11 locus by transposon tagging. RNA gel blot experiments show that an11 is expressed independently from an1 and an2 throughout plant development, as well as in tissues that do not express the anthocyanin pathway. It encodes a novel WD-repeat protein that is highly conserved even in species that do not produce anthocyanins such as yeast, nematodes, and mammals. The observation that the human an11 homolog partially complements the an11 petunia mutant in transient assays shows that sequence similarity reflects functional conservation. Overexpression of an2 in an11- petals restored the activity of a structural anthocyanin gene in transient assays, indicating that AN11 acts upstream of AN2. Cell fractionation experiments show that the bulk of the AN11 protein is localized in the cytoplasm. Taken together, this indicates that AN11 is a cytoplasmic component of a conserved signal transduction cascade that modulates AN2 function in petunia, thereby linking cellular signals with transcriptional activation.

Additional References

RELATED GEPHE

Related Genes

3 (anthocyanin2 (an2), MYB-FL, bHLH2) (https://www.gephebase.org/search-criteria?/or+Taxon ID=^33119^/and+Trait=Coloration/and+groupHaplotypes=true#gephebase-summary-title)

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS

@TE - WDR1 is also named WDR and anthocyanin11 (an11).