

GEPHE SUMMARY

CYCD5;1 (https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=^CYCD5;1^#gephebase-summary-title)	Gephebase Gene	GP00000196	GepheID
Published	Entry Status	Martin	Main curator

PHENOTYPIC CHANGE

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

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

GENOTYPIC CHANGE

CYCD5-1	Generic Gene Name	Q2V3B2 (http://www.uniprot.org/uniprot/Q2V3B2)	UniProtKB Arabidopsis thaliana
cyclin d5;1; F19F18.120; F19F18_120; At4g37630	Synonyms	AL035605 (https://www.ncbi.nlm.nih.gov/nucore/AL035605)	GenebankID or UniProtKB
3702.AT4G37630.1 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=3702.AT4G37630.1)	String		
Belongs to the cyclin family. Cyclin D subfamily.	Sequence Similarities		
GO:0019901 : protein kinase binding (https://www.ebi.ac.uk/QuickGO/term/GO:0019901)	GO - Molecular Function		
GO:0016538 : cyclin-dependent protein serine/threonine kinase regulator activity (https://www.ebi.ac.uk/QuickGO/term/GO:0016538)	GO - Biological Process		

GO:0051301 : cell division (<https://www.ebi.ac.uk/QuickGO/term/GO:0051301>)
 GO:0008284 : positive regulation of cell proliferation (<https://www.ebi.ac.uk/QuickGO/term/GO:0008284>)
 GO:0006468 : protein phosphorylation (<https://www.ebi.ac.uk/QuickGO/term/GO:0006468>)
 GO:0042023 : DNA endoreduplication (<https://www.ebi.ac.uk/QuickGO/term/GO:0042023>)
 GO:0000278 : mitotic cell cycle (<https://www.ebi.ac.uk/QuickGO/term/GO:0000278>)
 GO:0045787 : positive regulation of cell cycle (<https://www.ebi.ac.uk/QuickGO/term/GO:0045787>)
 GO:0000079 : regulation of cyclin-dependent protein serine/threonine kinase activity (<https://www.ebi.ac.uk/QuickGO/term/GO:0000079>)
 GO:0007088 : regulation of mitotic nuclear division (<https://www.ebi.ac.uk/QuickGO/term/GO:0007088>)

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:0000307 : cyclin-dependent protein kinase holoenzyme complex (<https://www.ebi.ac.uk/QuickGO/term/GO:0000307>)

Unknown (https://www.gephebase.org/search-criteria?/and+Presumptive Null=^Unknown^#gephebase-summary-title)	Presumptive Null
Cis-regulatory (https://www.gephebase.org/search-criteria?/and+Molecular Type=^Cis-regulatory^#gephebase-summary-title)	Molecular Type
Unknown (https://www.gephebase.org/search-criteria?/and+Aberration Type=^Unknown^#gephebase-summary-title)	Aberration Type
unknown	Molecular Details of the Mutation
Linkage Mapping (https://www.gephebase.org/search-criteria?/and+Experimental Evidence=^Linkage Mapping^#gephebase-summary-title)	Experimental Evidence
Combined linkage and association mapping reveals CYCD5;1 as a quantitative trait gene for endoreduplication in Arabidopsis. (2012) (https://pubmed.ncbi.nlm.nih.gov/22392991)	Main Reference
Sterken R; Kiekens R; Boruc J; Zhang F; Vercauteren A; Vercauteren I; De Smet L; Dhondt S; InzÄ© D; De Veylder L; Russinova E; Vuylsteke M	Authors
Endoreduplication is the process where a cell replicates its genome without mitosis and cytokinesis, often followed by cell differentiation. This alternative cell cycle results in various levels of endoploidy, reaching 4Ä– or higher one haploid set of chromosomes. Endoreduplication is found in animals and is widespread in plants, where it plays a major role in cellular differentiation and plant development. Here, we show that variation in endoreduplication between Arabidopsis thaliana accessions Columbia-0 and Kashmir is controlled by two major quantitative trait loci, ENDO-1 and ENDO-2. A local candidate gene association analysis in a set of 87 accessions, combined with expression analysis, identified CYCD5;1 as the most likely candidate gene underlying ENDO-2, operating as a rate-determining factor of endoreduplication. In accordance, both the overexpression and silencing of CYCD5;1 were effective in changing DNA ploidy levels, confirming CYCD5;1 to be a previously undescribed quantitative trait gene underlying endoreduplication in Arabidopsis.	Abstract
	Additional References

RELATED GEPHE

No matches found.	Related Genes
No matches found.	Related Haplotypes

EXTERNAL LINKS

COMMENTS