

GEPHE SUMMARY

		Gephebase Gene		GepheID
alcohol dehydrogenase (Adh) (https://www.gephebase.org/search-criteria?/and+Gene)			GP00001989	
Gephebase="alcohol dehydrogenase (Adh)"#gephebase-summary-title)				Main curator
Published		Entry Status	Courtier	

PHENOTYPIC CHANGE

		Trait Category		
Physiology (https://www.gephebase.org/search-criteria?/and+Trait)				
Category="Physiology"#gephebase-summary-title)		Trait		
Xenobiotic resistance (alcohol) (<a (alcohol)"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait=" resistance="" xenobiotic="">https://www.gephebase.org/search-criteria?/and+Trait="Xenobiotic resistance (alcohol)"#gephebase-summary-title)				
		Trait State in Taxon A		
Drosophila melanogaster - low enzyme activity				
		Trait State in Taxon B		
Drosophila melanogaster - RI-42 allele - extremely low enzyme activity				
		Ancestral State		
Taxon A				
		Taxonomic Status		
Intraspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic)				
Status="Intraspecific"#gephebase-summary-title)				
Taxon A		Taxon B		
	Latin Name		Latin Name	
Drosophila melanogaster		Drosophila melanogaster		
(https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms="Drosophila melanogaster"#gephebase-summary-title)		(https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms="Drosophila melanogaster"#gephebase-summary-title)		
	Common Name		Common Name	
fruit fly		fruit fly		
	Synonyms		Synonyms	
Sophophora melanogaster; fruit fly; Drosophila melanogaster Meigen, 1830; Sophophora melanogaster (Meigen, 1830); Drosophila melangaster		Sophophora melanogaster; fruit fly; Drosophila melanogaster Meigen, 1830; Sophophora melanogaster (Meigen, 1830); Drosophila melangaster		
	Rank		Rank	
species		species		
	Lineage		Lineage	
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Holometabola; Diptera; Brachycera; Muscomorpha; Eremoneura; Cyclorrhapha; Schizophora; Acalyptratae; Ephydroidea; Drosophilidae; Drosophilinae; Drosophilini; Drosophila; Sophophora; melanogaster group; melanogaster subgroup		cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Holometabola; Diptera; Brachycera; Muscomorpha; Eremoneura; Cyclorrhapha; Schizophora; Acalyptratae; Ephydroidea; Drosophilidae; Drosophilinae; Drosophilini; Drosophila; Sophophora; melanogaster group; melanogaster subgroup		
	Parent		Parent	
melanogaster subgroup () - (Rank: species subgroup)		melanogaster subgroup () - (Rank: species subgroup)		
(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 32351)		(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 32351)		
	NCBI Taxonomy ID		NCBI Taxonomy ID	
7227		7227		
(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 7227)		(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 7227)		
	is Taxon A an Intraspecies?		is Taxon B an Intraspecies?	
No		No		

GENOTYPIC CHANGE

		Generic Gene Name		UniProtKB Drosophila melanogaster
Adh			P00334 (http://www.uniprot.org/uniprot/P00334)	
		Synonyms		GenebankID or UniProtKB
adh; ADH; Adh3; BG:DS01486.8; CG32954; CG3481; dADH; DM-ADH; DmADH; Dmel\CG3481; Dreg-1; Reg-1; T16			M22210 (https://www.ncbi.nlm.nih.gov/nucore/M22210)	
		String		
7227.FBpp0100048				
(http://string-db.org/newstring.cgi/show_network_section.pl?identifier= 7227.FBpp0100048)				
		Sequence Similarities		
Belongs to the short-chain dehydrogenases/reductases (SDR) family.				
		GO - Molecular Function		
GO:0042803 : protein homodimerization activity				
(https://www.ebi.ac.uk/QuickGO/term/GO:0042803)				
GO:0008774 : acetaldehyde dehydrogenase (acetylating) activity				

(<https://www.ebi.ac.uk/QuickGO/term/GO:0008774>)
GO:0004022 : alcohol dehydrogenase (NAD) activity
(<https://www.ebi.ac.uk/QuickGO/term/GO:0004022>)
GO:0016491 : oxidoreductase activity (<https://www.ebi.ac.uk/QuickGO/term/GO:0016491>)
GO - Biological Process

GO:0006117 : acetaldehyde metabolic process
(<https://www.ebi.ac.uk/QuickGO/term/GO:0006117>)
GO:0046164 : alcohol catabolic process
(<https://www.ebi.ac.uk/QuickGO/term/GO:0046164>)
GO:0006066 : alcohol metabolic process
(<https://www.ebi.ac.uk/QuickGO/term/GO:0006066>)
GO:0048149 : behavioral response to ethanol
(<https://www.ebi.ac.uk/QuickGO/term/GO:0048149>)
GO:0006067 : ethanol metabolic process
(<https://www.ebi.ac.uk/QuickGO/term/GO:0006067>)
GO:0006069 : ethanol oxidation (<https://www.ebi.ac.uk/QuickGO/term/GO:0006069>)
GO:0055114 : oxidation-reduction process
(<https://www.ebi.ac.uk/QuickGO/term/GO:0055114>)

GO - Cellular Component

GO:0005829 : cytosol (<https://www.ebi.ac.uk/QuickGO/term/GO:0005829>)
GO:0032991 : protein-containing complex
(<https://www.ebi.ac.uk/QuickGO/term/GO:0032991>)

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

insertion of a complete 5.2kb copia retroviral-like transposable element 240 bp upstream from the distal (adult) adh transcriptional start site

Molecular Details of the Mutation

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

Experimental Evidence

Insertion of a copia element 5' to the *Drosophila melanogaster* alcohol dehydrogenase gene (*adh*) is associated with altered developmental and tissue-specific patterns of expression. (1989)
(<https://pubmed.ncbi.nlm.nih.gov/2470641>)

Main Reference

Strand DJ; McDonald JF

Authors

The *Drosophila melanogaster* alcohol dehydrogenase gene (*adh*) is under the control of two separate promoters (proximal and distal) which are preferentially utilized at the larval and adult life stages, respectively. A variant alcohol dehydrogenase allele (RI-42) isolated from a natural population contains a copia retroviral-like transposable element inserted 240 bp upstream from the distal (adult) *adh* transcriptional start site. Levels of *adh* transcripts in the RI-42 variant are reduced in tissues and at life stages where copia is actively expressed and are affected in trans- by mutant alleles at the suppressor-of-white-apricot (*su(wa)*) and suppressor-of-forked (*su(f)*) loci. These suppressor genes have no effect on *adh* expression in wild-type *Drosophila*.

Abstract

Additional References

RELATED GEPHE

Related Genes

19 (Acetylcholinesterase (*Ace-2*), Aldehyde dehydrogenase (*Aldh*), CG11699, *Cyp12d1*, *Cyp28d1*, *Cyp28d1-Cyp28d2*, *cyp6d2*, *cyp6g1*, glutamate-gated chloride channel (*GluCl*), *GSS* (glutathione synthetase), *GSTE1-E10* cluster, kin of *irre* (*kire*), *para* (*kdr*), *PHGPx*, resistance to dieldrin, *RnrS*, *SOD1*, *Ugt86Dd*, *CHKov1*) (<https://www.gephebase.org/search-criteria?/or+Taxon ID=^7227^/and+Trait=Xenobiotic resistance/and+groupHaplotypes=true#gephebase-summary-title>)

Related Haplotypes

4 ([https://www.gephebase.org/search-criteria?/or+Gene Gephebase=^alcohol dehydrogenase \(Adh\)^/and+Taxon ID=^7227^/or+Gene Gephebase=^alcohol dehydrogenase \(Adh\)^/and+Taxon ID=^7227^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Gene Gephebase=^alcohol dehydrogenase (Adh)^/and+Taxon ID=^7227^/or+Gene Gephebase=^alcohol dehydrogenase (Adh)^/and+Taxon ID=^7227^#gephebase-summary-title))

EXTERNAL LINKS

COMMENTS

<http://flybase.org/reports/FBal0000376>

