

GEPHE SUMMARY

		Gephebase Gene	GepheID
alcohol dehydrogenase (Adh) (https://www.gephebase.org/search-criteria?/and+Gene)		GP00001990	
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)			
Drosophila melanogaster - low enzyme activity		Trait State in Taxon A	
Drosophila melanogaster - AdhnAC14 allele - no enzyme activity		Trait State in Taxon B	
Taxon A		Ancestral State	
Intraspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic)		Taxonomic Status	
Status="Intraspecific"#gephebase-summary-title)			
Taxon A		Taxon B	
		Latin Name	Latin Name
Drosophila melanogaster		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)	
fruit fly		Common Name	Common Name
fruit fly		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	
species		Rank	Rank
species		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	
melanogaster subgroup () - (Rank: species subgroup)		Parent	Parent
(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 32351)		melanogaster subgroup () - (Rank: species subgroup)	
		NCBI Taxonomy ID	NCBI Taxonomy ID
7227		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)	
No		is Taxon A an Intraspecies?	is Taxon B an Intraspecies?
No		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)	
7227.FBpp0100048		String	
(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>)

Presumptive Null

Yes ([https://www.gephebase.org/search-criteria?/and+Presumptive Null=~Yes^#gephebase-summary-title](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](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](https://www.gephebase.org/search-criteria?/and+Aberration+Type=~Insertion^#gephebase-summary-title))

Insertion Size

1-9 bp

Molecular Details of the Mutation

eight extra nucleotides (in two groups of four) in the second intron commencing six bases 3' from the 5' splice site. A stop codon was also found in exon 2. S1 nuclease protection experiments have shown that the insertions in intron 2 disrupt the correct splicing of intron 2. The null allele produces a transcript approximately 100 bases longer than the normal mature adult transcript, and the amount of the null allele transcript is only about 10% of the normal level.

Experimental Evidence

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

Main Reference

Aberrant splicing of a naturally occurring alcohol dehydrogenase null activity allele in *Drosophila melanogaster*. (1990) (<https://pubmed.ncbi.nlm.nih.gov/2128291>)

Authors

Freeth AL; Gibson JB; Wilks AV

Abstract

The DNA sequence of a naturally occurring alcohol dehydrogenase null activity allele, *AdhnAC14*, has eight extra nucleotides (in two groups of four) in the second intron, commencing six bases 3' from the 5' splice site. A stop codon was also found in exon 2. S1 nuclease protection experiments have shown that the insertions in intron 2 disrupt the correct splicing of intron 2. The null allele produces a transcript approximately 100 bases longer than the normal mature adult transcript, and the amount of the null allele transcript is only about 10% of the normal level.

Additional References

Molecular relationships between alcohol dehydrogenase null-activity alleles from natural populations of *Drosophila melanogaster*. (1992) (<https://pubmed.ncbi.nlm.nih.gov/1560761>)

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](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

@Splicing - <http://flybase.org/reports/FBal0000377> <http://flybase.org/reports/FBal0000385>

