

GEPHE SUMMARY

	Gephebase Gene		GepheID
Ubiquitin-specific peptidase 46 (Usp46) (https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=^Ubiquitin-specific+peptidase+46+(Usp46)^#gephebase-summary-title)		GP00001159	
	Entry Status	Martin	Main curator
Published			

PHENOTYPIC CHANGE

	Trait Category		
Behavior (https://www.gephebase.org/search-criteria?/and+Trait+Category=^Behavior^#gephebase-summary-title)		Trait	
Escape behavior (immobility in inescapable situations) (https://www.gephebase.org/search-criteria?/and+Trait=^Escape+behavior+(immobility+in+inescapable+situations)^#gephebase-summary-title)			
	Trait State in Taxon A		
Mus musculus		Trait State in Taxon B	
Mus musculus - immobility test resistant			
	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
Mus musculus (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Mus+musculus^#gephebase-summary-title)		Mus musculus (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Mus+musculus^#gephebase-summary-title)	
	Common Name		Common Name
house mouse		house mouse	
	Synonyms		Synonyms
house mouse; mouse; Mus musculus Linnaeus, 1758; mice C57BL/6xCBA/CaJ hybrid		house mouse; mouse; Mus musculus Linnaeus, 1758; mice C57BL/6xCBA/CaJ hybrid	
	Rank		Rank
species		species	
	Lineage		Lineage
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia; Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi; Sarcopterygii; Dipnotetrapodomorpha; Tetrapoda; Amniota; Mammalia; Theria; Eutheria; Boreoeutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus		cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia; Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi; Sarcopterygii; Dipnotetrapodomorpha; Tetrapoda; Amniota; Mammalia; Theria; Eutheria; Boreoeutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus	
	Parent		Parent
Mus () - (Rank: subgenus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=862507)		Mus () - (Rank: subgenus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=862507)	
	NCBI Taxonomy ID		NCBI Taxonomy ID
10090 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=10090)		10090 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=10090)	
	is Taxon A an Infrappecies?		is Taxon B an Infrappecies?
No		No	

GENOTYPIC CHANGE

	Generic Gene Name		UniProtKB Mus musculus
Usp46		P62069 (http://www.uniprot.org/uniprot/P62069)	
	Synonyms		GenebankID or UniProtKB
AI451644; 1190009E20Rik; 2410018I08Rik		BC039916 (https://www.ncbi.nlm.nih.gov/nucore/BC039916)	
	String		
10090.ENSMUSP00000070554 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=10090.ENSMUSP00000070554)			
	Sequence Similarities		
Belongs to the peptidase C19 family. USP12/USP46 subfamily.			
	GO - Molecular Function		
GO:0046872 : metal ion binding (https://www.ebi.ac.uk/QuickGO/term/GO:0046872)			
GO:0004197 : cysteine-type endopeptidase activity (https://www.ebi.ac.uk/QuickGO/term/GO:0004197)			
GO:0004843 : thiol-dependent ubiquitin-specific protease activity (https://www.ebi.ac.uk/QuickGO/term/GO:0004843)			

GO:0036459 : thiol-dependent ubiquitinyl hydrolase activity
(<https://www.ebi.ac.uk/QuickGO/term/GO:0036459>)
GO:0101005 : ubiquitinyl hydrolase activity
(<https://www.ebi.ac.uk/QuickGO/term/GO:0101005>)

GO - Biological Process

GO:0008343 : adult feeding behavior
(<https://www.ebi.ac.uk/QuickGO/term/GO:0008343>)
GO:0048149 : behavioral response to ethanol
(<https://www.ebi.ac.uk/QuickGO/term/GO:0048149>)
GO:0006511 : ubiquitin-dependent protein catabolic process
(<https://www.ebi.ac.uk/QuickGO/term/GO:0006511>)
GO:0016579 : protein deubiquitination
(<https://www.ebi.ac.uk/QuickGO/term/GO:0016579>)
GO:0060013 : righting reflex (<https://www.ebi.ac.uk/QuickGO/term/GO:0060013>)
GO:0001662 : behavioral fear response
(<https://www.ebi.ac.uk/QuickGO/term/GO:0001662>)
GO:0050862 : positive regulation of T cell receptor signaling pathway
(<https://www.ebi.ac.uk/QuickGO/term/GO:0050862>)
GO:0099149 : regulation of postsynaptic neurotransmitter receptor internalization
(<https://www.ebi.ac.uk/QuickGO/term/GO:0099149>)
GO:0032228 : regulation of synaptic transmission, GABAergic
(<https://www.ebi.ac.uk/QuickGO/term/GO:0032228>)

GO - Cellular Component

GO:0005829 : cytosol (<https://www.ebi.ac.uk/QuickGO/term/GO:0005829>)
GO:0005634 : nucleus (<https://www.ebi.ac.uk/QuickGO/term/GO:0005634>)
GO:0098978 : glutamatergic synapse
(<https://www.ebi.ac.uk/QuickGO/term/GO:0098978>)
GO:0045202 : synapse (<https://www.ebi.ac.uk/QuickGO/term/GO:0045202>)

No (https://www.gephebase.org/search-criteria?/and+Presumptive Null=~No~#gephebase-summary-title)	Presumptive Null
Coding (https://www.gephebase.org/search-criteria?/and+Molecular Type=~Coding~#gephebase-summary-title)	Molecular Type
Deletion (https://www.gephebase.org/search-criteria?/and+Aberration Type=~Deletion~#gephebase-summary-title)	Aberration Type
1-9 bp	Deletion Size
1a.a. deletion	Molecular Details of the Mutation
Linkage Mapping (https://www.gephebase.org/search-criteria?/and+Experimental Evidence=~Linkage Mapping~#gephebase-summary-title)	Experimental Evidence
Usp46 is a quantitative trait gene regulating mouse immobile behavior in the tail suspension and forced swimming tests. (2009) (https://pubmed.ncbi.nlm.nih.gov/19465912)	Main Reference
Tomida S; Mamiya T; Sakamaki H; Miura M; Aosaki T; Masuda M; Niwa M; Kameyama T; Kobayashi J; Iwaki Y; Imai S; Ishikawa A; Abe K; Yoshimura T; Nabeshima T; Ebihara S	Authors
The tail suspension test (TST) and forced swimming test (FST) are widely used for assessing antidepressant activity and depression-like behavior. We found that CS mice show negligible immobility in inescapable situations. Quantitative trait locus (QTL) mapping using CS and C57BL/6J mice revealed significant QTLs on chromosomes 4 (FST) and 5 (TST and FST). To identify the quantitative trait gene on chromosome 5, we narrowed the QTL interval to 0.5 Mb using several congenic and subcongenic strains. Ubiquitin-specific peptidase 46 (Usp46) with a lysine codon deletion was located in this region. This deletion affected nest building, muscimol-induced righting reflex and anti-immobility effects of imipramine. The muscimol-induced current in the hippocampal CA1 pyramidal neurons and hippocampal expression of the 67-kDa isoform of glutamic acid decarboxylase were significantly decreased in the Usp46 mutant mice compared to control mice. These phenotypes were rescued in transgenic mice with bacterial artificial chromosomes containing wild-type Usp46. Thus, Usp46 affects the immobility in the TST and FST, and it is implicated in the regulation of GABA action.	Abstract
	Additional References

RELATED GEPHE

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

EXTERNAL LINKS

COMMENTS

