GEPHE SUMMARY

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

GepheID
GP00000301

Entry Status
Published

Main curator
Martin

PHENOTYPIC CHANGE

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

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

Trait State in Taxon A
Homo sapiens

Trait State in Taxon B
Homo sapiens

Ancestral State
Unknown

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

Taxon A

Latin Name
Homo sapiens (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Homo sapiens^#gephebase-summary-title)

Common Name
human

Synonyms
human; man; Homo sapiens Linnaeus, 1758; Home sapiens; Homo sampiens; Homo sapeins; Homo sapian; Homo sapians; Homo sapien; Homo sapience; Homo sapiense; Homo sapients; Homo sapines; Homo spaiens; Homo spiens; Humo sapiens

Rank
species

Lineage
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia; Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi; Sarcopterygii; Dipnotetrapodomorpha; Tetrapoda; Amniota; Mammalia; Theria; Eutheria; Boreoeutheria; Euarchontoglires; Primates; Haplorrhini; Simiiformes; Catarrhini; Hominoidea; Hominidae; Homininae; Homo

Parent
Homo () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9605)

NCBI Taxonomy ID
9606 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9606)

is Taxon A an Infraspecies?
No

Taxon B

Latin Name
Homo sapiens (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Homo sapiens^#gephebase-summary-title)

Common Name
human

Synonyms
human; man; Homo sapiens Linnaeus, 1758; Home sapiens; Homo sampiens; Homo sapeins; Homo sapian; Homo sapians; Homo sapien; Homo sapience; Homo sapiense; Homo sapients; Homo sapines; Homo spaiens; Homo spiens; Humo sapiens

Rank
species

Lineage
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia; Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi; Sarcopterygii; Dipnotetrapodomorpha; Tetrapoda; Amniota; Mammalia; Theria; Eutheria; Boreoeutheria; Euarchontoglires; Primates; Haplorrhini; Simiiformes; Catarrhini; Hominoidea; Hominidae; Homininae; Homo

Parent
Homo () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9605)

NCBI Taxonomy ID
9606 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9606)

is Taxon B an Infraspecies?
No

GENOTYPIC CHANGE

Generic Gene Name
Faah

Synonyms
Faah1

String
10116.ENSRNOP00000015961 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier=10116.ENSRNOP00000015961)

Sequence Similarities
Belongs to the amidase family.

GO - Molecular Function
GO:0042802 : identical protein binding (https://www.ebi.ac.uk/QuickGO/term/GO:0042802)
GO:0042803 : protein homodimerization activity (https://www.ebi.ac.uk/QuickGO/term/GO:0042803)

UniProtKB Rattus norvegicus
P97612 (http://www.uniprot.org/uniprot/P97612)

GenebankID or UniProtKB
()

GO:0008289 : lipid binding (https://www.ebi.ac.uk/QuickGO/term/GO:0008289)
GO:0005543 : phospholipid binding (https://www.ebi.ac.uk/QuickGO/term/GO:0005543)
GO:0016788 : hydrolase activity, acting on ester bonds
(https://www.ebi.ac.uk/QuickGO/term/GO:0016788)
GO:0004040 : amidase activity (https://www.ebi.ac.uk/QuickGO/term/GO:0004040)
GO:0103073 : anandamide amidohydrolase activity
(https://www.ebi.ac.uk/QuickGO/term/GO:0103073)
GO:0017064 : fatty acid amide hydrolase activity
(https://www.ebi.ac.uk/QuickGO/term/GO:0017064)
GO:0102077 : oleamide hydrolase activity
(https://www.ebi.ac.uk/QuickGO/term/GO:0102077)

GO - Biological Process

GO:0009062 : fatty acid catabolic process
(https://www.ebi.ac.uk/QuickGO/term/GO:0009062)
GO:0006631 : fatty acid metabolic process
(https://www.ebi.ac.uk/QuickGO/term/GO:0006631)
GO:0097756 : negative regulation of blood vessel diameter
(https://www.ebi.ac.uk/QuickGO/term/GO:0097756)

GO - Cellular Component

GO:0016021 : integral component of membrane
(https://www.ebi.ac.uk/QuickGO/term/GO:0016021)
GO:0000139 : Golgi membrane (https://www.ebi.ac.uk/QuickGO/term/GO:0000139)
GO:0005789 : endoplasmic reticulum membrane
(https://www.ebi.ac.uk/QuickGO/term/GO:0005789)
GO:0031090 : organelle membrane (https://www.ebi.ac.uk/QuickGO/term/GO:0031090)

Presumptive Null

No (https://www.gephebase.org/search-criteria?/and+Presumptive Null=^No^#gephebase-summary-title)

Molecular Type

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

Aberration Type

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

SNP Coding Change

Nonsynonymous

Molecular Details of the Mutation

Pro129Thr (C385A; common variant rs324420)

Experimental Evidence

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

	Taxon A	Taxon B	Position
Codon	-	-	-
Amino-acid	-	-	-

Main Reference

FAAH genetic variation enhances fronto-amygdala function in mouse and human. (2015) (https://pubmed.ncbi.nlm.nih.gov/25731744)

Authors

Dincheva I; Drysdale AT; Hartley CA; Johnson DC; Jing D; King EC; Ra S; Gray JM; Yang R; DeGruccio AM; Huang C; Cravatt BF; Glatt CE; Hill MN; Casey BJ; Lee FS

Abstract

Cross-species studies enable rapid translational discovery and produce the broadest impact when both mechanism and phenotype are consistent across organisms. We developed a knock-in mouse that biologically recapitulates a common human mutation in the gene for fatty acid amide hydrolase (FAAH) (C385A; rs324420), the primary catabolic enzyme for the endocannabinoid anandamide. This common polymorphism impacts the expression and activity of FAAH, thereby increasing anandamide levels. Here, we show that the genetic knock-in mouse and human variant allele carriers exhibit parallel alterations in biochemisty, neurocircuitry and behaviour. Specifically, there is reduced FAAH expression associated with the variant allele that selectively enhances fronto-amygdala connectivity and fear extinction learning, and decreases anxiety-like behaviours. These results suggest a gain of function in fear regulation and may indicate for whom and for what anxiety symptoms FAAH inhibitors or exposure-based therapies will be most efficacious, bridging an important translational gap between the mouse and human.

Additional References

RELATED GEPHE

Related Genes

No matches found.

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS

See GWAS literature on additional traits associated to this SNP