GEPHE SUMMARY

Gephebase Gene

FGF5 (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^FGF5^#gephebase-summary-title)

Entry Status

Published

GepheID

GP00002442

Main curator

Courtier

PHENOTYPIC CHANGE

Trait Category

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

Trait

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

Trait State in Taxon A

normal hair length

Trait State in Taxon B

abnormally long hair - moja recessive mutation

Ancestral State

Taxon A

Taxonomic Status

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

Taxon A

Latin Name

Mus musculus (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Mus musculus^#gephebase-summary-title)

Common Name

house mouse

Synonyms

house mouse; mouse; Mus musculus Linnaeus, 1758; mice C57BL/6xCBA/CaJ hybrid

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; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus

Parent

Mus () - (Rank: subgenus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 862507)

NCBI Taxonomy ID

10090 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 10090)

is Taxon A an Infraspecies?

No

Taxon B

Latin Name

Mus musculus (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Mus musculus^#gephebase-summary-title)

Common Name

house mouse

Synonyms

house mouse; mouse; Mus musculus Linnaeus, 1758; mice C57BL/6xCBA/CaJ hybrid

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; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus

Parent

Mus () - (Rank: subgenus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 862507)

NCBI Taxonomy ID

10090 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 10090)

is Taxon B an Infraspecies?

No

GENOTYPIC CHANGE

Generic Gene Name

Fgf5

Synonyms

go; Fgf-5; HBGF-5; angora

String

10090.ENSMUSP00000031280 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier= 10090.ENSMUSP00000031280)

Sequence Similarities

Belongs to the heparin-binding growth factors family.

GO - Molecular Function

GO:0008083 : growth factor activity (https://www.ebi.ac.uk/QuickGO/term/GO:0008083)
GO:0005104 : fibroblast growth factor receptor binding (https://www.ebi.ac.uk/QuickGO/term/GO:0005104)

GO - Biological Process

GO:0008283 : cell proliferation (https://www.ebi.ac.uk/QuickGO/term/GO:0008283)
GO:0008284 : positive regulation of cell proliferation (https://www.ebi.ac.uk/QuickGO/term/GO:0008284)

UniProtKB Mus musculus

P15656 (http://www.uniprot.org/uniprot/P15656)

GenebankID or UniProtKB

()

GO:0051781 : positive regulation of cell division
(https://www.ebi.ac.uk/QuickGO/term/GO:0051781)
GO:0008543 : fibroblast growth factor receptor signaling pathway
(https://www.ebi.ac.uk/QuickGO/term/GO:0008543)
GO:0010001 : glial cell differentiation
(https://www.ebi.ac.uk/QuickGO/term/GO:0010001)
GO:0023019 : signal transduction involved in regulation of gene expression
(https://www.ebi.ac.uk/QuickGO/term/GO:0023019)

GO - Cellular Component

GO:0005576 : extracellular region (https://www.ebi.ac.uk/QuickGO/term/GO:0005576)

Presumptive Null

Yes (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)

Aberration Type

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

Deletion Size

1-10 kb

Molecular Details of the Mutation

Deletion of a 9.3-kb region in the Fgf5 gene including exon 3 and its 5′ and 3′ flanking sequences. The genomic deletion site also shows insertion of a 498-bp early transposon element long terminal repeat.

Experimental Evidence

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

Main Reference

Retrotransposon-mediated Fgf5(go-Utr) mutant mice with long pelage hair. (2011) (https://pubmed.ncbi.nlm.nih.gov/21512271)

Authors

Mizuno S; Iijima S; Okano T; Kajiwara N; Kunita S; Sugiyama F; Yagami K

Abstract

We found 6 spontaneous mutant mice with long pelage hair in our ICR breeding colony. The abnormal trait was restricted to long hair in these mice, which we named moja. They were fertile and showed the same growth and behavior as wild-type mice. To investigate the manner of the genetic inheritance of the moja allele, offspring were bred by mating the moja mice; all offspring had long pelage hair. Furthermore, we performed a reciprocal cross between moja mice and wild-type ICR mice with normal hair. All offspring exhibited normal hair suggesting an autosomal recessive inheritance of the trait. The moja/moja hair phenotype was maintained in skin grafted onto nude mice, suggesting that circulating or diffusible humoral factors regulating the hair cycle are not involved in the abnormal trait. The phenotype of moja/moja mice is similar to that of Fgf5-deficient mice. Therefore, we examined the expression of Fgf5 by RT-PCR in moja/moja mice. As expected, no Fgf5 expression was found in moja/moja mouse skin. PCR and DNA sequence analyses were performed to investigate the structure of the Fgf5 gene. We found a deletion of a 9.3-kb region in the Fgf5 gene including exon 3 and its 5′ and 3′ flanking sequences. Interestingly, the genomic deletion site showed insertion of a 498-bp early transposon element long terminal repeat. Taken together, these results suggest that the long hair mutation of moja/moja mice is caused by disruption of Fgf5 mediated by insertion of a retrotransposon.

Additional References

RELATED GEPHE

Related Genes

No matches found.

Related Haplotypes

1 (https://www.gephebase.org/search-criteria?/or+Gene Gephebase=^FGF5^/and+Taxon ID=^10090^/or+Gene Gephebase=^FGF5^/and+Taxon ID=^10090^#gephebase-summary-title)

EXTERNAL LINKS

COMMENTS

@TE - These were spontaneous mutant mice with long pelage hair in a breeding colony.