

GEPHE SUMMARY

FGF5 (https://www.gephebase.org/search-criteria?/and+Gene Gephebase="FGF5" #gephebase-summary-title)	Gephebase Gene	GP00002172	GepheID
Published	Entry Status	Martin	Main curator

PHENOTYPIC CHANGE

Morphology (https://www.gephebase.org/search-criteria?/and+Trait Category="Morphology" #gephebase-summary-title)	Trait Category		
Hair length (length) (https://www.gephebase.org/search-criteria?/and+Trait="Hair length (length) #gephebase-summary-title)	Trait		
Cat with WT hair	Trait State in Taxon A		
Norwegian Forest breed with long hair	Trait State in Taxon B		
Taxon A	Ancestral State		
Domesticated (https://www.gephebase.org/search-criteria?/and+Taxonomic Status="Domesticated" #gephebase-summary-title)	Taxonomic Status		
	Taxon A		Taxon B
	Latin Name		Latin Name
Felis catus (<a felis"="" href="https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms="Felis catus" #gephebase-summary-title)	Latin Name	Felis catus (<a felis"="" href="https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms="Felis catus" #gephebase-summary-title)	Latin Name
domestic cat	Common Name	domestic cat	Common Name
Felis domesticus; Felis silvestris catus; domestic cat; cat; cats; Felis catus Linnaeus, 1758; Korat cats L.	Synonyms	Felis domesticus; Felis silvestris catus; domestic cat; cat; cats; Felis catus Linnaeus, 1758; Korat cats L.	Synonyms
species	Rank	species	Rank
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia; Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi; Sarcopterygii; Dipnotetrapodomorpha; Tetrapoda; Amniota; Mammalia; Theria; Eutheria; Boreoeutheria; Laurasiatheria; Carnivora; Feliformia; Felidae; Felinae; Felis	Lineage	cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia; Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi; Sarcopterygii; Dipnotetrapodomorpha; Tetrapoda; Amniota; Mammalia; Theria; Eutheria; Boreoeutheria; Laurasiatheria; Carnivora; Feliformia; Felidae; Felinae; Felis	Lineage
Felis () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9682)	Parent	Felis () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9682)	Parent
9685 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9685)	NCBI Taxonomy ID	9685 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9685)	NCBI Taxonomy ID
No	is Taxon A an Intraspecies?	Yes	is Taxon B an Intraspecies?
		Norwegian Forest	Taxon B Description

GENOTYPIC CHANGE

Fgf5	Generic Gene Name	P15656 (http://www.uniprot.org/uniprot/P15656)	UniProtKB Mus musculus
go; Fgf-5; HBGF-5; angora	Synonyms	0	GenebankID or UniProtKB
10090.ENSMUSP00000031280 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=10090.ENSMUSP00000031280)	String		
Belongs to the heparin-binding growth factors family.	Sequence Similarities		
GO:0008083 : growth factor activity (https://www.ebi.ac.uk/QuickGO/term/GO:0008083)	GO - Molecular Function		
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>)
 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

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

Insertion Size

1-9 bp

Molecular Details of the Mutation

c.ins356T resulting in frameshift

Experimental Evidence

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

Main Reference

Mutations within the FGF5 gene are associated with hair length in cats. (2007) (<https://pubmed.ncbi.nlm.nih.gov/17433015>)

Authors

DrÄ¶gemÄ¼4ller C; RÄ¼4fenacht S; Wichert B; Leeb T

Abstract

Hereditary hair length variability in mice and dogs is caused by mutations within the fibroblast growth factor 5 (FGF5) gene. The aim of this study was to evaluate the feline FGF5 orthologue as a functional candidate gene for the long hair phenotype in cats, which is recessive to short hair. We amplified the feline FGF5 cDNA and characterised two alternatively spliced transcripts by RT-PCR. Comparative cDNA and genomic DNA sequencing of long- and short-haired cats revealed four non-synonymous polymorphisms in the FGF5 coding sequence. A missense mutation (AM412646:c.194C>A) was found in the homozygous state in 25 long-haired Somali, Persian, Maine Coon, Ragdoll and crossbred cats. Fifty-five short-haired cats had zero or one copy of this allele. Additionally, we found perfect co-segregation of the c.194C>A mutation within two independent pedigrees segregating for hair length. A second FGF5 exon 1 missense mutation (AM412646:c.182T>A) was found exclusively in long-haired Norwegian Forest cats. The c.182T>A mutation probably represents a second FGF5 mutation responsible for long hair in cats. In addition to the c.194C>A mutation, a frameshift mutation (AM412646:c.474delT) was found with a high frequency in the long-haired Maine Coon breed. Finally, a missense mutation (AM412646:c.475A>C) was also associated with the long-haired phenotype in some breeds. However, as one short-haired cat was homozygous for this polymorphism, it is unlikely that it has a functional role in the determination of hair length.

Additional References

Four independent mutations in the feline fibroblast growth factor 5 gene determine the long-haired phenotype in domestic cats. (2007 Sep-Oct) (<https://pubmed.ncbi.nlm.nih.gov/17767004>)

RELATED GEPHE

Related Genes

No matches found.

Related Haplotypes

1 (<https://www.gephebase.org/search-criteria?/or+Gene+Gephebase=^FGF5^/and+Taxon+ID=^9685^/or+Gene+Gephebase=^FGF5^/and+Taxon+ID=^9685^#gephebase-summary-title>)

EXTERNAL LINKS

COMMENTS

<https://omia.org/OMIA000439/10036/>