

## GEPHE SUMMARY

	Gephebase Gene	GephelD
FGF5 ( <a href="https://www.gephebase.org/search-criteria/?and+Gene+Gephebase=%FGF5%#gephebase-summary-title">https://www.gephebase.org/search-criteria/?and+Gene+Gephebase=%FGF5%#gephebase-summary-title</a> )	GP00000311	
	Entry Status	Main curator
Published		

## PHENOTYPIC CHANGE

	Trait Category	
Morphology ( <a href="https://www.gephebase.org/search-criteria/?and+Trait+Category=%Morphology%#gephebase-summary-title">https://www.gephebase.org/search-criteria/?and+Trait+Category=%Morphology%#gephebase-summary-title</a> )	Trait	
Hair length (length) ( <a href="https://www.gephebase.org/search-criteria/?and+Trait=%Hair+length+length%#gephebase-summary-title">https://www.gephebase.org/search-criteria/?and+Trait=%Hair+length+length%#gephebase-summary-title</a> )	Trait State in Taxon A	
Cat with WT hair	Trait State in Taxon B	
Maine Coon breed with long hair	Ancestral State	
Taxon A	Taxonomic Status	
Domesticated ( <a href="https://www.gephebase.org/search-criteria/?and+Taxonomic+Status=%Domesticated%#gephebase-summary-title">https://www.gephebase.org/search-criteria/?and+Taxonomic+Status=%Domesticated%#gephebase-summary-title</a> )		
Taxon A		Taxon B
	Latin Name	Latin Name
Felis catus ( <a href="https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=%Felis+catus%#gephebase-summary-title">https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=%Felis+catus%#gephebase-summary-title</a> )	Felis catus ( <a href="https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=%Felis+catus%#gephebase-summary-title">https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=%Felis+catus%#gephebase-summary-title</a> )	
domestic cat	Common Name	Common Name
	Synonyms	Synonyms
Felis domesticus; Felis silvestris catus; domestic cat; cat; cats; Felis catus Linnaeus, 1758; Korat cats L.		Felis domesticus; Felis silvestris catus; domestic cat; cat; cats; Felis catus Linnaeus, 1758; Korat cats L.
	Rank	Rank
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; Laurasiatheria; Carnivora; Feliformia; Felidae; Felinae; Felis		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
	Parent	Parent
Felis () - (Rank: genus) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9682">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9682</a> )	Felis () - (Rank: genus) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9682">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9682</a> )	
9685 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9685">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9685</a> )	NCBI Taxonomy ID 9685	NCBI Taxonomy ID 9685
No	is Taxon A an Infraspecies?	is Taxon B an Infraspecies?
	Yes	Yes
	Maine Coon	Taxon B Description

## GENOTYPIC CHANGE

	Generic Gene Name	UniProtKB Mus musculus
Fgf5	P15656 ( <a href="http://www.uniprot.org/uniprot/P15656">http://www.uniprot.org/uniprot/P15656</a> )	
go: Fgf-5; HBGF-5; angora	Synonyms	GenebankID or UniProtKB
10090.ENSMUSP00000031280 ( <a href="http://string-db.org/newstring_cgi/show_network_section.pl?identifier=10090.ENSMUSP00000031280">http://string-db.org/newstring_cgi/show_network_section.pl?identifier=10090.ENSMUSP00000031280</a> )	String	0
	Sequence Similarities	
Belongs to the heparin-binding growth factors family.		
	GO - Molecular Function	
GO:0008083 : growth factor activity ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0008083">https://www.ebi.ac.uk/QuickGO/term/GO:0008083</a> )		
GO:0005104 : fibroblast growth factor receptor binding ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0005104">https://www.ebi.ac.uk/QuickGO/term/GO:0005104</a> )		
	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 ([#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Presumptive+Null=^Yes))

Molecular Type

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

Aberration Type

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

Deletion Size

1-9 bp

Molecular Details of the Mutation

c.474delT resulting in frameshift

Experimental Evidence

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

Main Reference

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

Authors

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Abstract

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

## EXTERNAL LINKS

## COMMENTS

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