

## GEPHE SUMMARY

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

<p>Morphology (<a href="https://www.gephebase.org/search-criteria?/and+Trait">https://www.gephebase.org/search-criteria?/and+Trait</a> Category="Morphology" #gephebase-summary-title)</p> <p>Hair length (length) (<a hair="" href="https://www.gephebase.org/search-criteria?/and+Trait=" length"="">https://www.gephebase.org/search-criteria?/and+Trait="Hair length</a> (length) #gephebase-summary-title)</p> <p>Cat with WT hair</p> <p>Norwegian Forest breed with long hair</p> <p>Taxon A</p> <p>Domesticated (<a href="https://www.gephebase.org/search-criteria?/and+Taxonomic">https://www.gephebase.org/search-criteria?/and+Taxonomic</a> Status="Domesticated" #gephebase-summary-title)</p>	<p>Trait Category</p> <p>Trait</p> <p>Trait State in Taxon A</p> <p>Trait State in Taxon B</p> <p>Ancestral State</p> <p>Taxonomic Status</p>	<p>Taxon A</p> <p>Latin Name</p> <p>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</a> catus" #gephebase-summary-title)</p> <p>Common Name</p> <p>domestic cat</p> <p>Synonyms</p> <p>Felis domesticus; Felis silvestris catus; domestic cat; cat; cats; Felis catus Linnaeus, 1758; Korat cats L.</p> <p>Rank</p> <p>species</p> <p>Lineage</p> <p>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</p> <p>Parent</p> <p>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>)</p> <p>NCBI Taxonomy ID</p> <p>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>)</p> <p>is Taxon A an Intraspecies?</p> <p>No</p>	<p>Taxon B</p> <p>Latin Name</p> <p>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</a> catus" #gephebase-summary-title)</p> <p>Common Name</p> <p>domestic cat</p> <p>Synonyms</p> <p>Felis domesticus; Felis silvestris catus; domestic cat; cat; cats; Felis catus Linnaeus, 1758; Korat cats L.</p> <p>Rank</p> <p>species</p> <p>Lineage</p> <p>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</p> <p>Parent</p> <p>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>)</p> <p>NCBI Taxonomy ID</p> <p>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>)</p> <p>is Taxon B an Intraspecies?</p> <p>Yes</p> <p>Taxon B Description</p> <p>Norwegian Forest</p>
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## GENOTYPIC CHANGE

<p>Fgf5</p> <p>go; Fgf-5; HBGF-5; angora</p> <p>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>)</p> <p>Belongs to the heparin-binding growth factors family.</p> <p>GO - Molecular Function</p> <p>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>)</p> <p>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>)</p> <p>GO - Biological Process</p>	<p>Generic Gene Name</p> <p>Synonyms</p> <p>String</p> <p>Sequence Similarities</p>	<p>P15656 (<a href="http://www.uniprot.org/uniprot/P15656">http://www.uniprot.org/uniprot/P15656</a>)</p> <p>0</p>	<p>UniProtKB Mus musculus</p> <p>GenebankID or UniProtKB</p>
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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/>