

GEPHE SUMMARY

	Gephebase Gene	GephelD
FGF5 (https://www.gephebase.org/search-criteria/?and+Gene+Gephebase=%FGF5%#gephebase-summary-title)	GP00002443	
	Entry Status	Main curator
Published	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	
WT hair	Trait State in Taxon B	
recessive long hair in Corgis dogs	Ancestral State	
Taxon A	Taxonomic Status	
Domesticated (https://www.gephebase.org/search-criteria/?and+Taxonomic+Status=%Domesticated%#gephebase-summary-title)		
Taxon A	Latin Name	Latin Name
Canis lupus familiaris (https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=%Canis+lupus+familiaris%#gephebase-summary-title)		
dog	Common Name	Common Name
Canis canis; Canis domesticus; Canis familiaris; dog; dogs; Canis familiaris Linnaeus, 1758; Canis lupus familiaris Linnaeus, 1758	Synonyms	Synonyms
subspecies	Rank	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; Caniformia; Canidae; Canis; Canis lupus	Lineage	Lineage
Canis lupus (gray wolf) - (Rank: species) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9612)	Parent	Parent
9615 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9615)	NCBI Taxonomy ID	NCBI Taxonomy ID
No	is Taxon A an Infraspecies?	is Taxon B an Infraspecies?
	Yes	Yes
	Corgi breed	Taxon B Description

GENOTYPIC CHANGE

	Generic Gene Name	UniProtKB Mus musculus
Fgf5	P15656 (http://www.uniprot.org/uniprot/P15656)	
go: Fgf-5; HBGF-5; angora		GenebankID or UniProtKB
10090.ENSMUSP00000031280 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier=10090.ENSMUSP00000031280)	ABB87177 (https://www.ncbi.nlm.nih.gov/nuccore/ABB87177)	
	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>)

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

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

Molecular Type

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

Aberration Type

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

SNP Coding Change

Nonsynonymous

Molecular Details of the Mutation

Presence of a duplication in a relatively non-conserved region of the gene and a missense mutation resulting in the substitution of Phe for Cys in a highly conserved region. Genotyping of 218 dogs from three breeds fixed for long hair; eight breeds fixed for short hair and five breeds in which long hair is segregating provided evidence that the missense mutation is associated with the hair-length differences among these breeds.

Experimental Evidence

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

	Taxon A	Taxon B	Position
Codon	-	-	-
Amino-acid	Phe	Cys	95

Main Reference

The long and the short of it: evidence that FGF5 is a major determinant of canine 'hair'-itability. (2006) (<https://pubmed.ncbi.nlm.nih.gov/16879338>)

Authors

Housley DJ; Venta PJ

Abstract

Hair length in dogs has been known for many years to be primarily controlled by a limited number of genes, but none of the genes have been identified. One of these genes produces a recessively inherited long-haired phenotype that has been thought to explain the bulk of hair-length variation among many breeds. Sequence analysis of the FGF5 gene in short and long-haired corgis resulted in the identification of two coding region differences: a duplication in a relatively non-conserved region of the gene and a missense mutation, resulting in the substitution of Phe for Cys, in a highly conserved region. Genotyping of 218 dogs from three breeds fixed for long hair, eight breeds fixed for short hair and five breeds in which long hair is segregating provided evidence that the missense mutation is associated with the hair-length differences among these breeds.

Additional References

RELATED GEPHE

Related Genes

1 (R-spondin-2 (RSPO2)) ([#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Taxon ID=^9615#/and+Trait=Hair length/and+groupHaplotypes=true))

Related Haplotypes

5 ([#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Gene Gephebase=^FGF5#/and+Taxon ID=^9615#/or+Gene Gephebase=^FGF5#/and+Taxon ID=^9615))

EXTERNAL LINKS

COMMENTS

