

GEPHE SUMMARY

	Gephebase Gene		GepheID
BMP receptor IB (BMPRI ^B) (https://www.gephebase.org/search-criteria?/and+Gene)		GP00000146	
Gephebase="BMP receptor IB (BMPRI ^B)"#gephebase-summary-title)			Main curator
Published	Entry Status	Martin	

PHENOTYPIC CHANGE

	Trait Category		
Physiology (https://www.gephebase.org/search-criteria?/and+Trait)			
Category="Physiology"#gephebase-summary-title)	Trait		
Fertility (increased ovulation rate) (<a fertility"="" href="https://www.gephebase.org/search-criteria?/and+Trait=">https://www.gephebase.org/search-criteria?/and+Trait="Fertility)			
(increased ovulation rate)"#gephebase-summary-title)	Trait State in Taxon A		
Ovis aries			
	Trait State in Taxon B		
Ovis aries - Boorola strain of Australian Merino Sheep			
	Ancestral State		
Taxon A			
	Taxonomic Status		
Domesticated (https://www.gephebase.org/search-criteria?/and+Taxonomic)			
Status="Domesticated"#gephebase-summary-title)			
Taxon A		Taxon B	
	Latin Name		Latin Name
Ovis aries		Ovis aries	
(https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms="Ovis		(https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms="Ovis	
aries"#gephebase-summary-title)		aries"#gephebase-summary-title)	
	Common Name		Common Name
sheep		sheep	
	Synonyms		Synonyms
Ovis ammon aries; Ovis orientalis aries; Ovis ovis; sheep; domestic sheep; lambs; wild sheep;		Ovis ammon aries; Ovis orientalis aries; Ovis ovis; sheep; domestic sheep; lambs; wild sheep;	
Ovis aries Linnaeus, 1758		Ovis aries Linnaeus, 1758	
	Rank		Rank
species		species	
	Lineage		Lineage
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia;		cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia;	
Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi; Sarcopterygii;		Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi; Sarcopterygii;	
Dipnotetrapodomorpha; Tetrapoda; Amniota; Mammalia; Theria; Eutheria; Boreoeutheria;		Dipnotetrapodomorpha; Tetrapoda; Amniota; Mammalia; Theria; Eutheria; Boreoeutheria;	
Laurasiatheria; Artiodactyla; Ruminantia; Pecora; Bovidae; Caprinae; Ovis		Laurasiatheria; Artiodactyla; Ruminantia; Pecora; Bovidae; Caprinae; Ovis	
	Parent		Parent
Ovis () - (Rank: genus)		Ovis () - (Rank: genus)	
(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=9935)		(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=9935)	
	NCBI Taxonomy ID		NCBI Taxonomy ID
9940		9940	
(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=9940)		(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=9940)	
	is Taxon A an Intraspecies?		is Taxon B an Intraspecies?
No		Yes	
			Taxon B Description
			Ovis aries - Boorola strain of Australian Merino Sheep

GENOTYPIC CHANGE

	Generic Gene Name		UniProtKB Ovis aries
BM ^B PR-IB		Q9BDI4 (http://www.uniprot.org/uniprot/Q9BDI4)	
	Synonyms		GenebankID or UniProtKB
ALK6; FecB; BM ^B PR-IB		AF357007 (https://www.ncbi.nlm.nih.gov/nucleotide/AF357007)	
-	String		
	Sequence Similarities		
Belongs to the protein kinase superfamily. TKL Ser/Thr protein kinase family. TGFB			
receptor subfamily.			
	GO - Molecular Function		
GO:0005524 : ATP binding (https://www.ebi.ac.uk/QuickGO/term/GO:0005524)			
GO:0046872 : metal ion binding (https://www.ebi.ac.uk/QuickGO/term/GO:0046872)			
GO:0004675 : transmembrane receptor protein serine/threonine kinase activity			
(https://www.ebi.ac.uk/QuickGO/term/GO:0004675)			
	GO - Biological Process		

GO:0002063 : chondrocyte development
 (https://www.ebi.ac.uk/QuickGO/term/GO:0002063)
 GO:0030166 : proteoglycan biosynthetic process
 (https://www.ebi.ac.uk/QuickGO/term/GO:0030166)
 GO:0060350 : endochondral bone morphogenesis
 (https://www.ebi.ac.uk/QuickGO/term/GO:0060350)
 GO:1902731 : negative regulation of chondrocyte proliferation
 (https://www.ebi.ac.uk/QuickGO/term/GO:1902731)
 GO:0061036 : positive regulation of cartilage development
 (https://www.ebi.ac.uk/QuickGO/term/GO:0061036)

GO - Cellular Component

GO:0016021 : integral component of membrane
 (https://www.ebi.ac.uk/QuickGO/term/GO:0016021)

Presumptive Null

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

Molecular Type

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

Aberration Type

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

SNP Coding Change

Nonsynonymous

Molecular Details of the Mutation

g.29382188A>G c.914A>G p.Q305R

Experimental Evidence

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

	Taxon A	Taxon B	Position
Codon	-	-	-
Amino-acid	Glu	Arg	305

Main Reference

Mutation in bone morphogenetic protein receptor-1B is associated with increased ovulation rate in Booroola MÃ©rino ewes. (2001) (https://pubmed.ncbi.nlm.nih.gov/11320249)

Authors

Mulsant P; Lecerf F; Fabre S; Schibler L; Monget P; Lanneluc I; Pisselet C; Riquet J; Monniaux D; Callebaut I; Cribeu E; Thimonier J; Teyssier J; Bodin L; CogniÃ© Y; Chitour N; Elsen JM

Abstract

Ewes from the Booroola strain of Australian MÃ©rino sheep are characterized by high ovulation rate and litter size. This phenotype is due to the action of the FecB(B) allele of a major gene named FecB, as determined by statistical analysis of phenotypic data. By genetic analysis of 31 informative half-sib families from heterozygous sires, we showed that the FecB locus is situated in the region of ovine chromosome 6 corresponding to the human chromosome 4q22-23 that contains the bone morphogenetic protein receptor 1B (BMPR-1B) gene encoding a member of the transforming growth factor-beta (TGF-beta) receptor family. A nonconservative substitution (Q249R) in the BMPR-1B coding sequence was found to be associated fully with the hyperprolificacy phenotype of Booroola ewes. In vitro, ovarian granulosa cells from FecB(B)/FecB(B) ewes were less responsive than granulosa cells from FecB(+)/FecB(+) ewes to the inhibitory effect on steroidogenesis of GDF-5 and BMP-4, natural ligands of BMPR-1B. It is suggested that in FecB(B)/FecB(B) ewes, BMPR-1B would be inactivated partially, leading to an advanced differentiation of granulosa cells and an advanced maturation of ovulatory follicles.

Additional References

RELATED GEPHE

Related Genes

3 (B4GALNT2, BMP15, GDF9) (https://www.gephebase.org/search-criteria?/or+Taxon ID=^9940^/and+Trait=Fertility/and+groupHaplotypes=true#gephebase-summary-title)

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS

@SexualTrait https://omia.org/OMIA000383/9940/

