

# ***Bmp1* Cas9-KO Strategy**

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# Project Overview

**Project Name**

***Bmp1***

**Project type**

**Cas9-KO**

**Strain background**

**C57BL/6JGpt**

# Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Bmp1* gene. The schematic diagram is as follows:



- The *Bmp1* gene has 7 transcripts. According to the structure of *Bmp1* gene, exon2-exon8 of *Bmp1-201* (ENSMUST00000022693.8) transcript is recommended as the knockout region. The region contains 923bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Bmp1* gene. The brief process is as follows: CRISPR/Cas9 system

- According to the existing MGI data, Homozygous targeted mutant embryos have reduced ossification of the skull, persistent herniation of the gut, abnormal collagen fibrils in the amnion, and die at birth.
- The *Bmp1* gene is located on the Chr14. If the knockout mice are crossed with other mice strains to obtain double gene positive homozygous mouse offspring, please avoid the two genes on the same chromosome.
- This Strategy is designed based on genetic information in existing databases. Due to the complexity of biological processes, all risk of the gene knockout on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.



# Gene information (NCBI)

## Bmp1 bone morphogenetic protein 1 [Mus musculus (house mouse)]

Gene ID: 12153, updated on 12-Mar-2019

### Summary



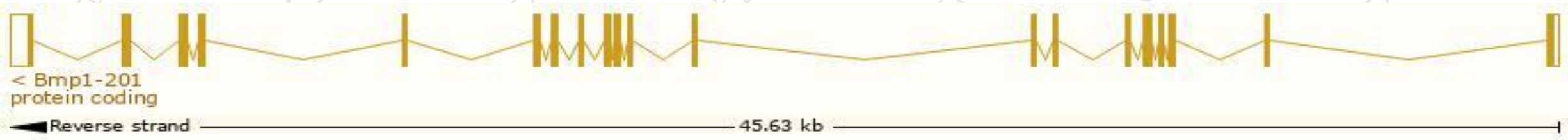
<b>Official Symbol</b>	Bmp1 provided by <a href="#">MGI</a>
<b>Official Full Name</b>	bone morphogenetic protein 1 provided by <a href="#">MGI</a>
<b>Primary source</b>	<a href="#">MGI:MGI:88176</a>
<b>See related</b>	<a href="#">Ensembl:ENSMUSG00000022098</a>
<b>Gene type</b>	protein coding
<b>RefSeq status</b>	REVIEWED
<b>Organism</b>	<a href="#">Mus musculus</a>
<b>Lineage</b>	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
<b>Also known as</b>	Pcp, Tld
<b>Summary</b>	This gene encodes a metalloproteinase that plays an essential role in the formation of the extracellular matrix and is also able to induce ectopic bone formation. Unlike other bone morphogenetic proteins, the protein encoded by this gene is not closely related to transforming growth factor-beta. This protein plays in role several developmental processes. In humans, mutations in this gene are associated with osteogenesis imperfecta and with increased bone mineral density and multiple recurrent fractures. Alternative splicing results in multiple transcript variants. [provided by RefSeq, Dec 2013]
<b>Expression</b>	Ubiquitous expression in limb E14.5 (RPKM 81.0), ovary adult (RPKM 50.8) and 25 other tissues <a href="#">See more</a>
<b>Orthologs</b>	<a href="#">human</a> <a href="#">all</a>

# Transcript information (Ensembl)

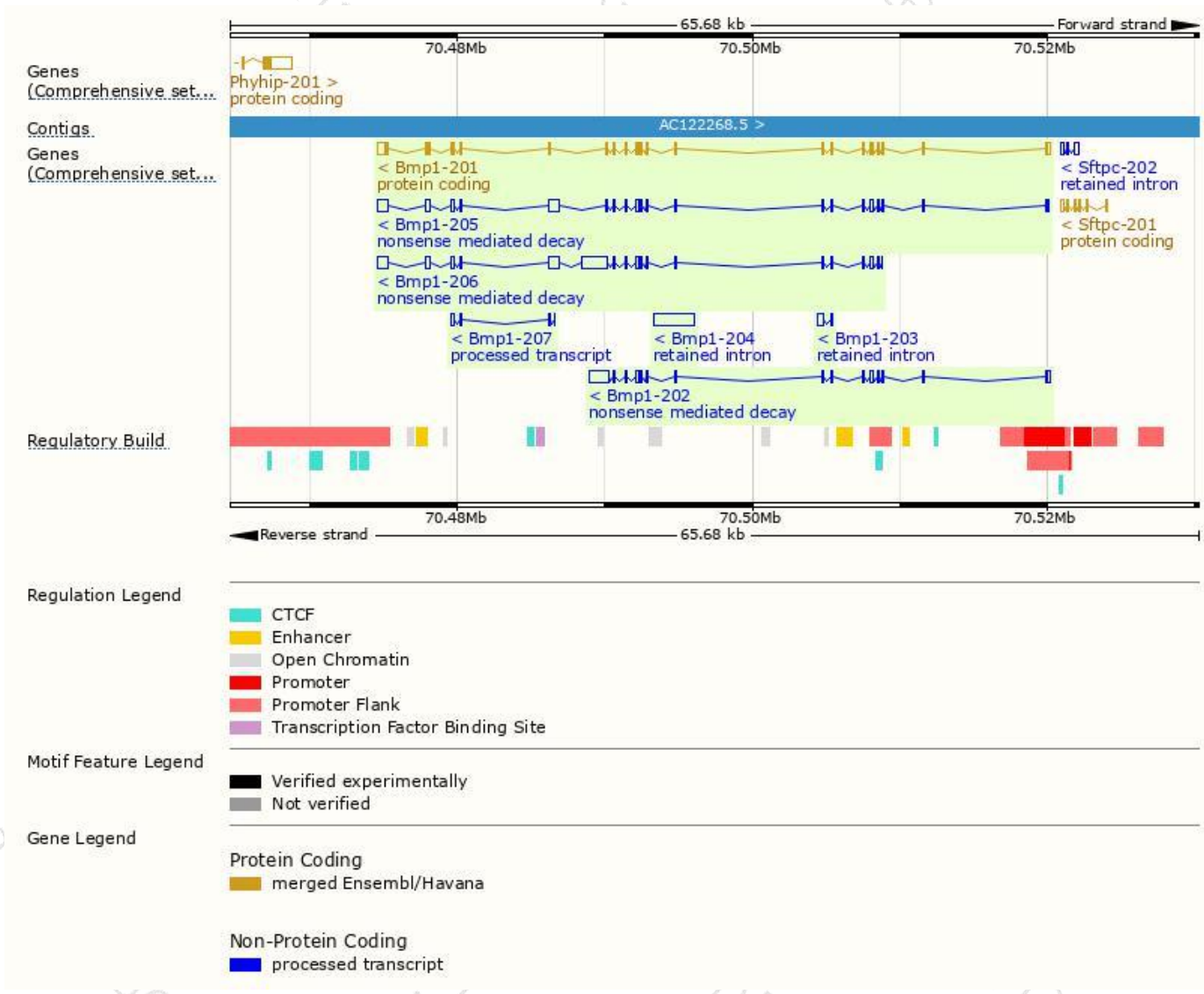
The gene has 7 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Bmp1-201	<a href="#">ENSMUST00000022693.8</a>	3684	<a href="#">991aa</a>	Protein coding	<a href="#">CCDS36972</a>	<a href="#">P98063</a>	TSL:1 GENCODE basic APPRIS P1
Bmp1-206	<a href="#">ENSMUST000000227944.1</a>	5365	<a href="#">57aa</a>	Nonsense mediated decay	-	<a href="#">A0A2I3BQB3</a>	CDS 5' incomplete
Bmp1-205	<a href="#">ENSMUST000000226906.1</a>	4340	<a href="#">194aa</a>	Nonsense mediated decay	-	<a href="#">A0A2I3BRJ8</a>	
Bmp1-202	<a href="#">ENSMUST000000226246.1</a>	3472	<a href="#">194aa</a>	Nonsense mediated decay	-	<a href="#">A0A2I3BRJ8</a>	
Bmp1-207	<a href="#">ENSMUST000000228501.1</a>	507	No protein	Processed transcript	-	-	
Bmp1-204	<a href="#">ENSMUST000000226601.1</a>	2736	No protein	Retained intron	-	-	
Bmp1-203	<a href="#">ENSMUST000000226539.1</a>	452	No protein	Retained intron	-	-	

The strategy is based on the design of *Bmp1-201* transcript,The transcription is shown below

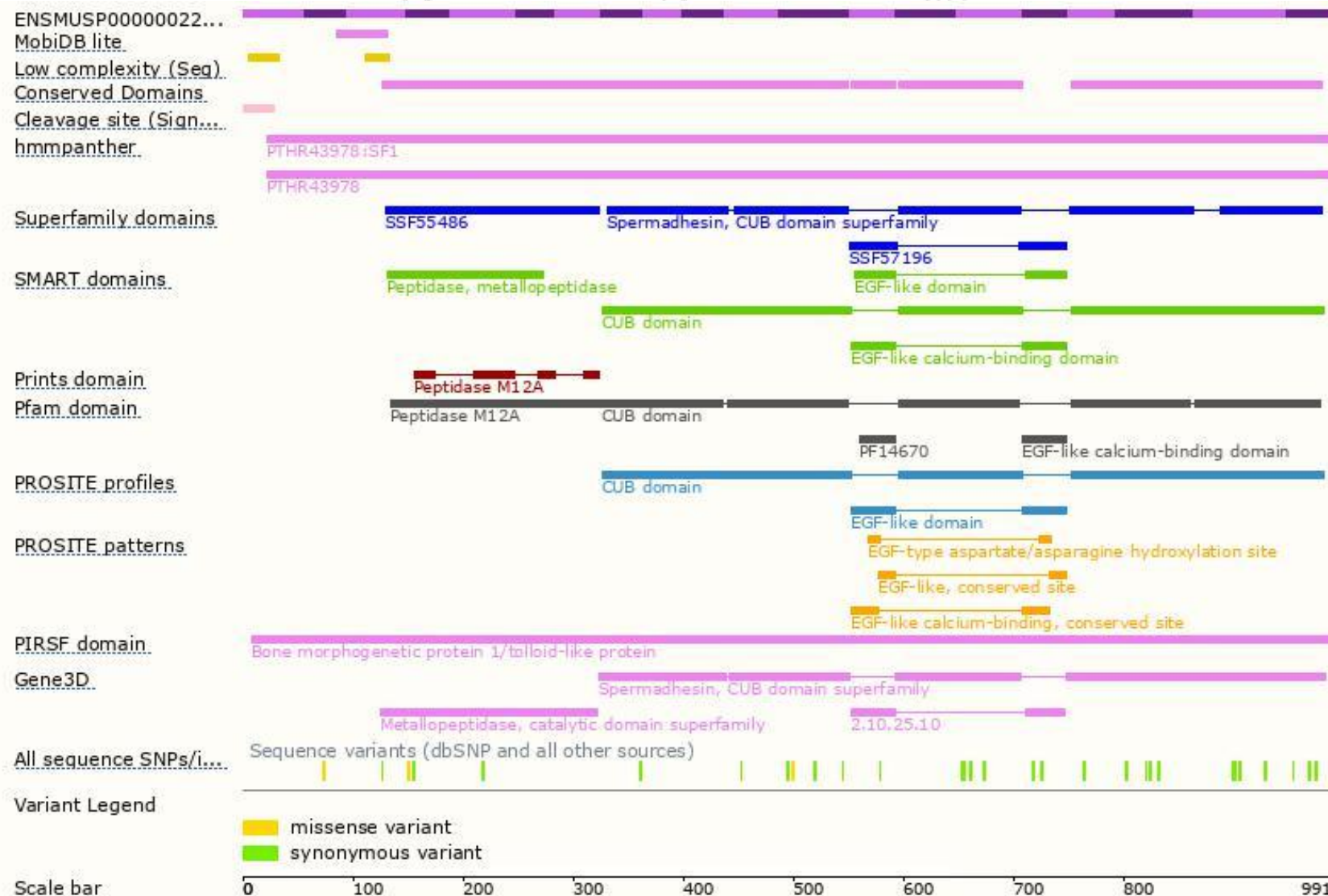


# Genomic location distribution

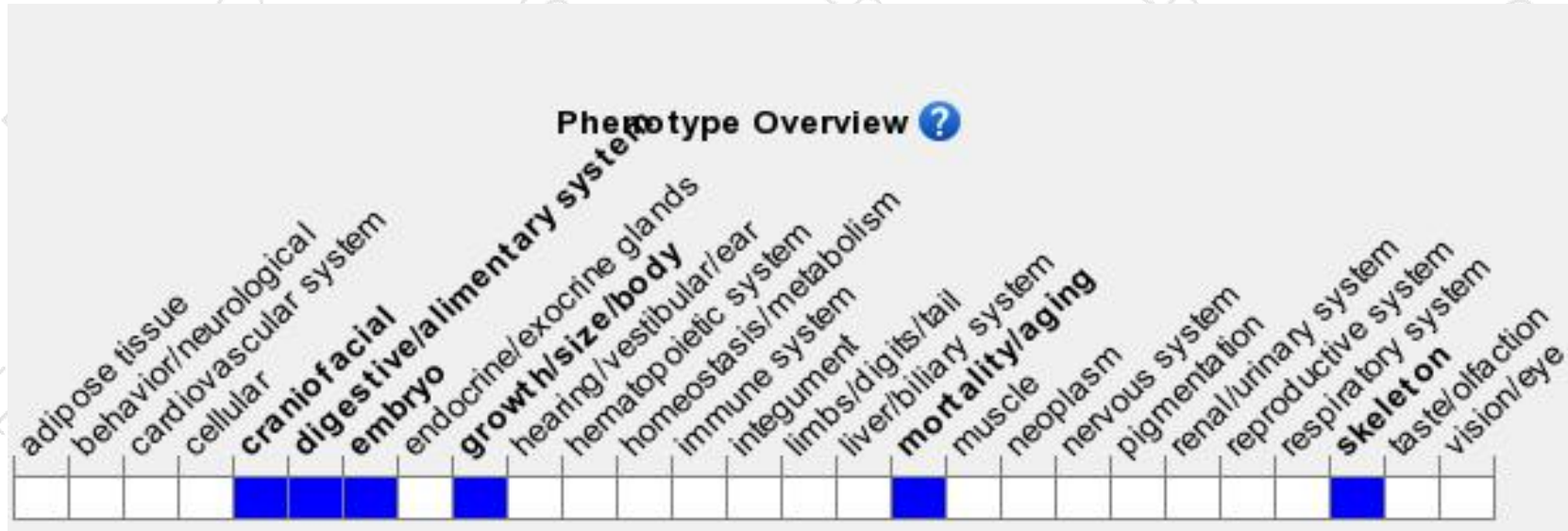




# Protein domain



# Mouse phenotype description(MGI )



*Phenotypes affected by the gene are marked in blue. Data quoted from MGI database(<http://www.informatics.jax.org/>).*

According to the existing MGI data, Homozygous targeted mutant embryos have reduced ossification of the skull, persistent herniation of the gut, abnormal collagen fibrils in the amnion, and die at birth.

If you have any questions, you are welcome to inquire.

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