Bmp7 Cas9-KO Strategy

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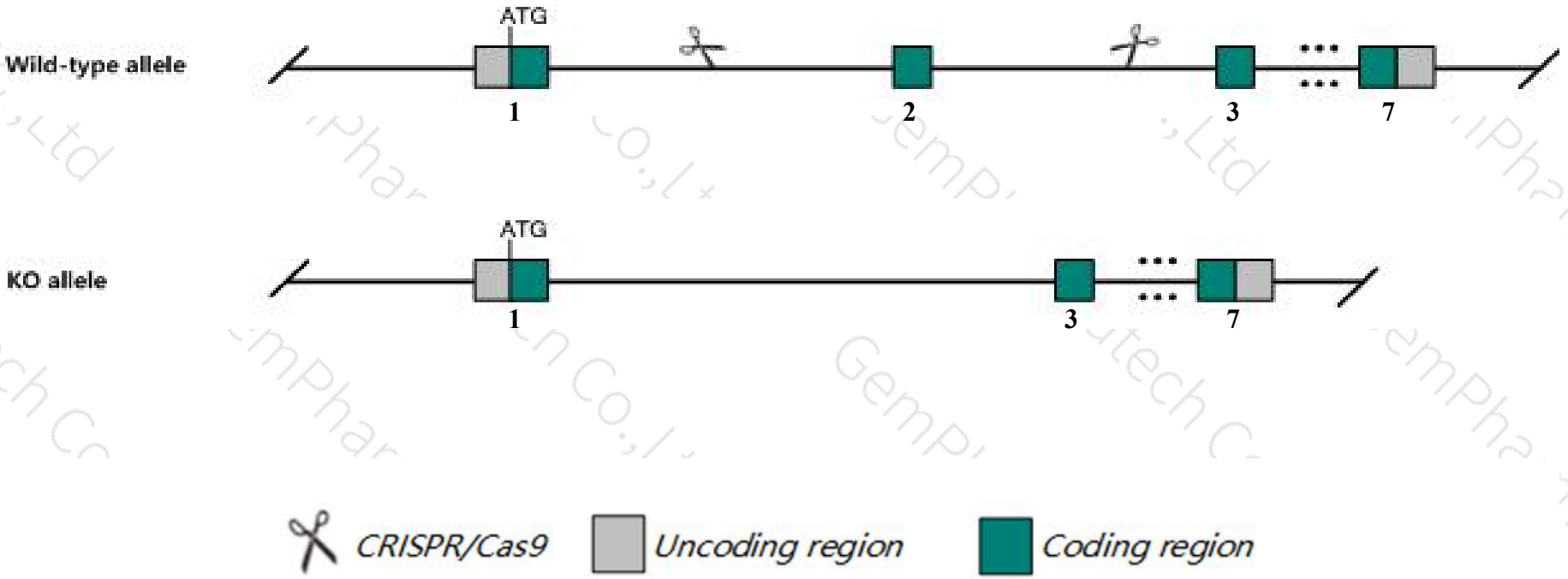
Project Overview

Project Name	***Bmp7***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Bmp7* gene. The schematic diagram is as follows:



Technical routes

➢ The *Bmp7* gene has 2 transcripts. According to the structure of *Bmp7* gene, exon2 of *Bmp7-201* (ENSMUST00000009143.7) transcript is recommended as the knockout region.The region contains 193bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Bmp7* gene. The brief process is as follows: CRISPR/Cas9 system

Notice

- According to the existing MGI data,Various homozygous targeted mutations result in postnatal lethality, a wide range of skeletal and cartilage abnormalities, renal dysplasia and polycystic kidney, and eye defects.

- Some amino acids will remain at the N-terminus and some functions may be retained.

- The *Bmp7* gene is located on the Chr2. 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）

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Bmp7 bone morphogenetic protein 7 [*Mus musculus* (house mouse)]

Gene ID: 12162, updated on 27-Aug-2019

Summary

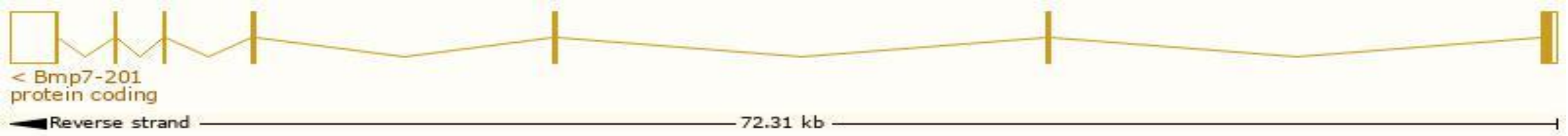
Official Symbol	Bmp7 provided by MGI
Official Full Name	bone morphogenetic protein 7 provided by MGI
Primary source	MGI:MGI:103302
See related	Ensembl:ENSMUSG00000008999
Gene type	protein coding
RefSeq status	REVIEWED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	OP1
Summary	This gene encodes a secreted ligand of the TGF-beta (transforming growth factor-beta) superfamily of proteins. Ligands of this family bind various TGF-beta receptors leading to recruitment and activation of SMAD family transcription factors that regulate gene expression. The encoded preproprotein is proteolytically processed to generate each subunit of the disulfide-linked homodimer. Mutation of this gene results in skeletal, kidney, and other developmental defects. [provided by RefSeq, Jul 2016]
Expression	Broad expression in adrenal adult (RPKM 31.1), kidney adult (RPKM 17.3) and 20 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

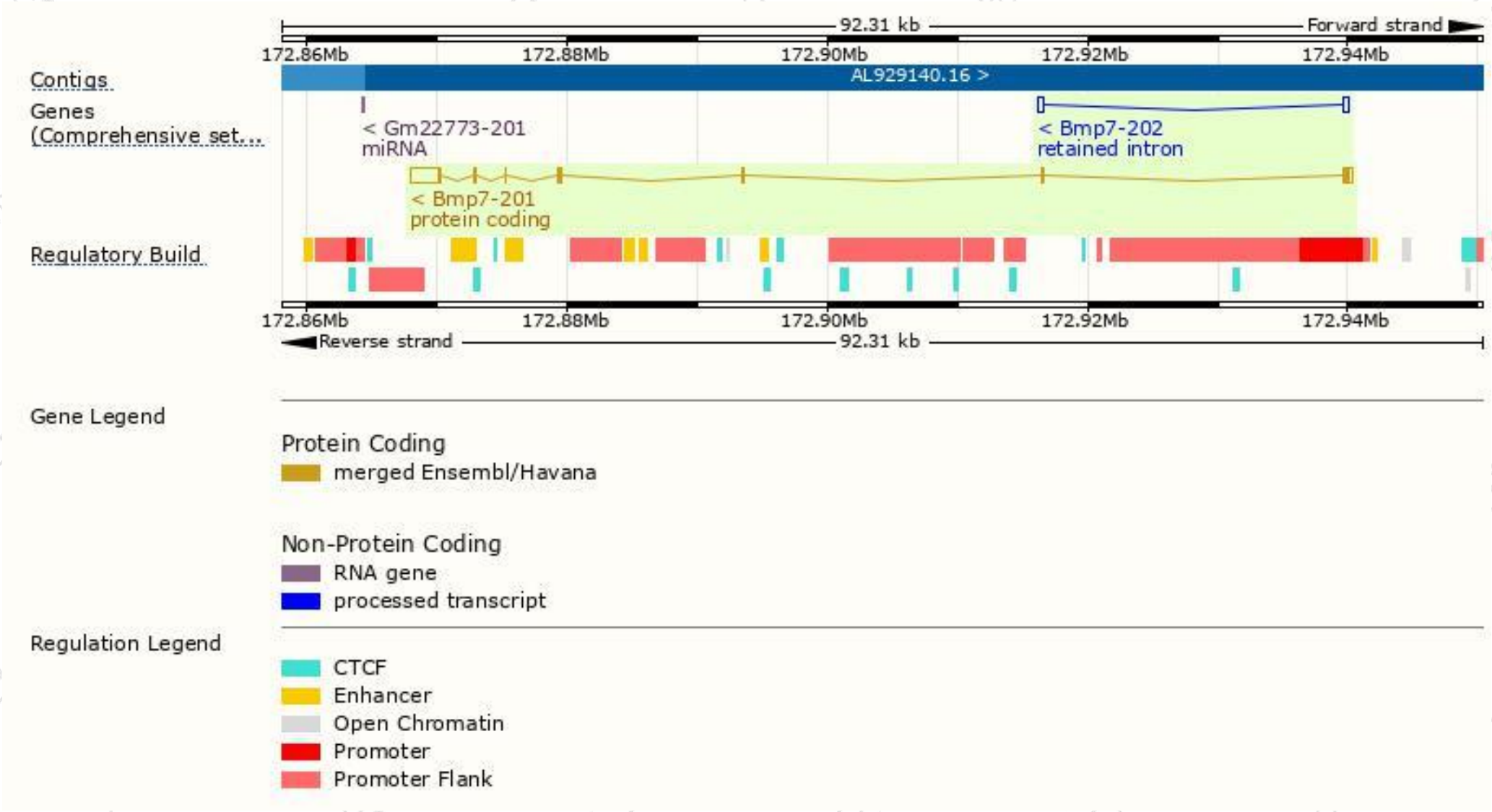
The gene has 2 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Bmp7-201	ENSMUST00000009143.7	3670	430aa	Protein coding	CCDS17136	P23359	TSL:1 GENCODE basic APPRIS P1
Bmp7-202	ENSMUST00000137247.1	980	No protein	Retained intron	-	-	TSL:2

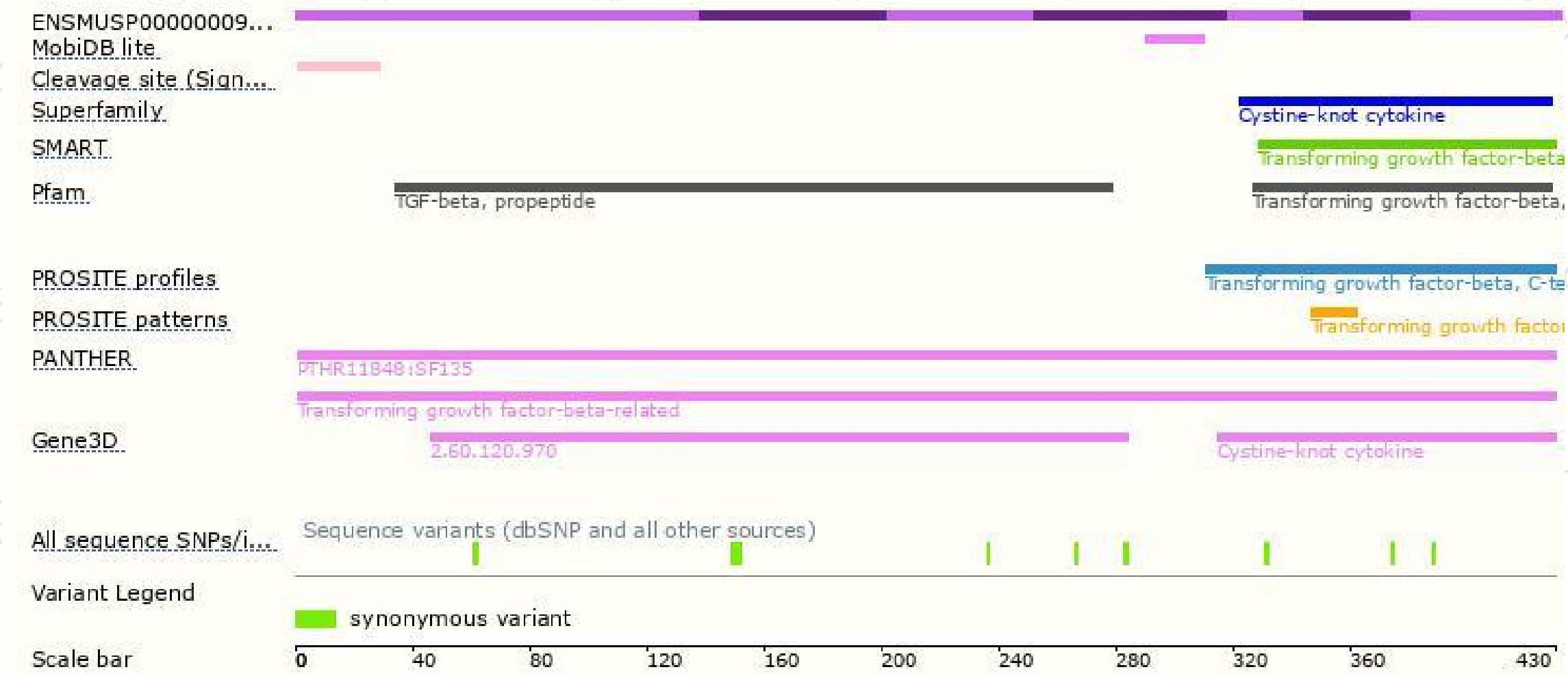
The strategy is based on the design of *Bmp7-201* transcript,The transcription is shown below



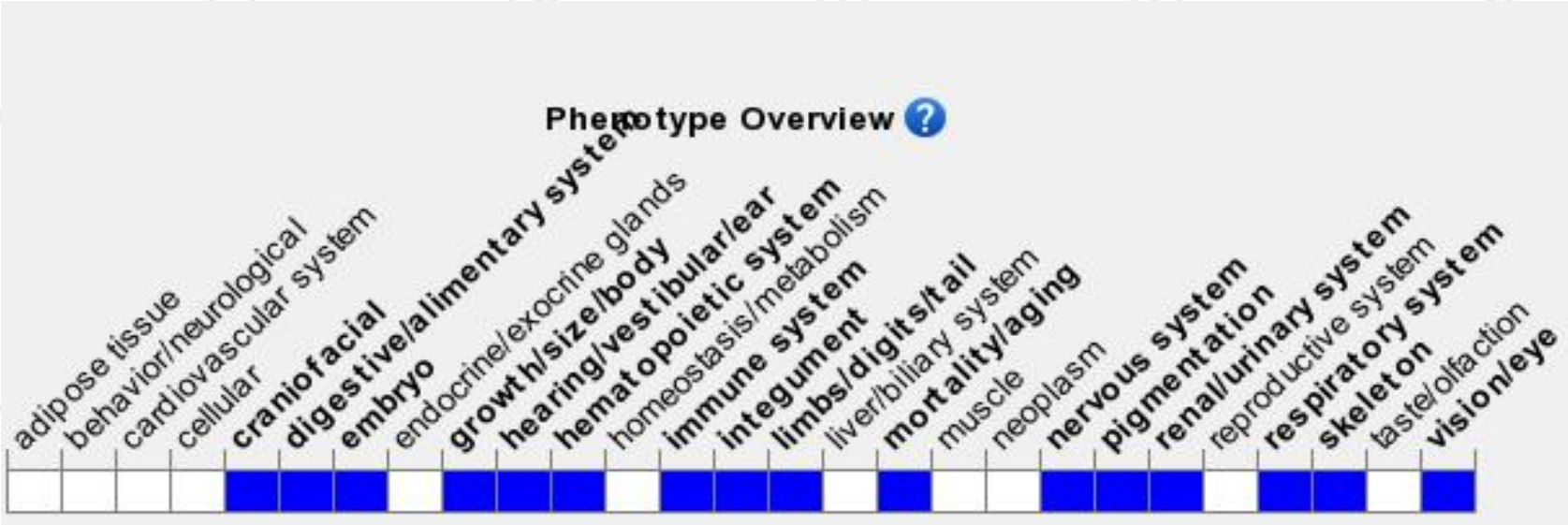
Genomic location distribution



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/).

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

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