Gpatch1 Cas9-CKO Strategy

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Project Overview

Project Name	***Gpatch1***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

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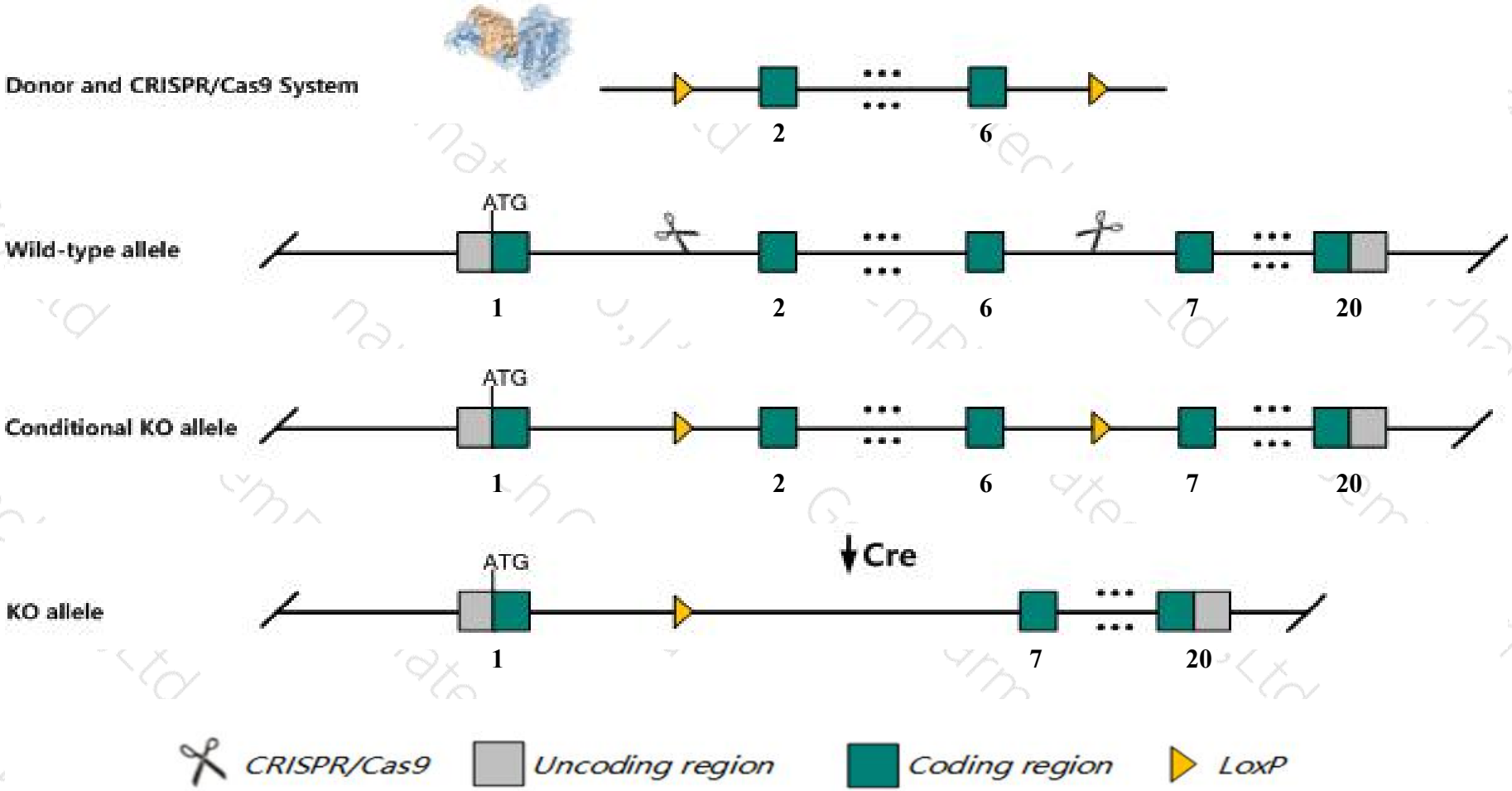
This model will use CRISPR/Cas9 technology to edit the *Gpatch1* gene. The schematic diagram is as follows:



Technical routes

➢ The *Gpatch1* gene has 5 transcripts. According to the structure of *Gpatch1* gene, exon2-exon6 of *Gpatch1-201*(ENSMUST00000079693.11) transcript is recommended as the knockout region.The region contains 539bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Gpatch1* gene. The brief process is as follows:CRISPR/Cas9 system and Donor were microinjected into the fertilized eggs of C57BL/6JGpt mice.Fertilized eggs were transplanted to obtain positive F0 mice which were confirmed by PCR and sequencing. A stable F1 generation mouse model was obtained by mating positive F0 generation mice with C57BL/6JGpt mice.

➢ The flox mice will be knocked out after mating with mice expressing Cre recombinase, resulting in the loss of function of the target gene in specific tissues and cell types.

Notice

➢ According to the existing MGI data,mice homozygous for a knock-out allele exhibit defects in placentation with abnormal trophoblast layer formation and complete lethality throughout fetal growth and development.

➢ The *Gpatch1* gene is located on the Chr7. 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at existing technological level.

Gene information （NCBI）

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Gpatch1 G patch domain containing 1 [Mus musculus (house mouse)]

Gene ID: 67471, updated on 13-Mar-2020

Summary

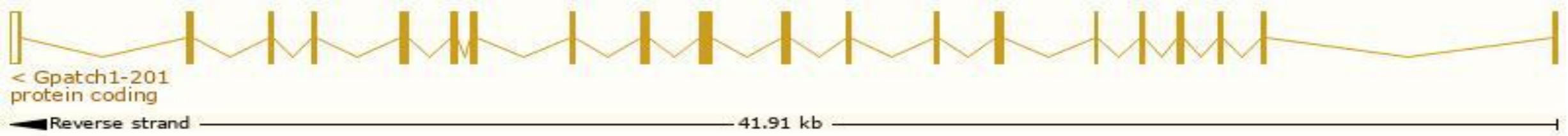
Official Symbol	Gpatch1 provided by MGI
Official Full Name	G patch domain containing 1 provided byMGI
Primary source	MGI:MGI:1914721
See related	Ensembl:ENSMUSG00000063808
Gene type	protein coding
RefSeq status	PROVISIONAL
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	1300003A17Rik, ECGP, Gpatc1
Expression	Ubiquitous expression in CNS E18 (RPKM 5.4), CNS E11.5 (RPKM 5.2) and 28 other tissuesSee more
Orthologs	human all

Transcript information（Ensembl）

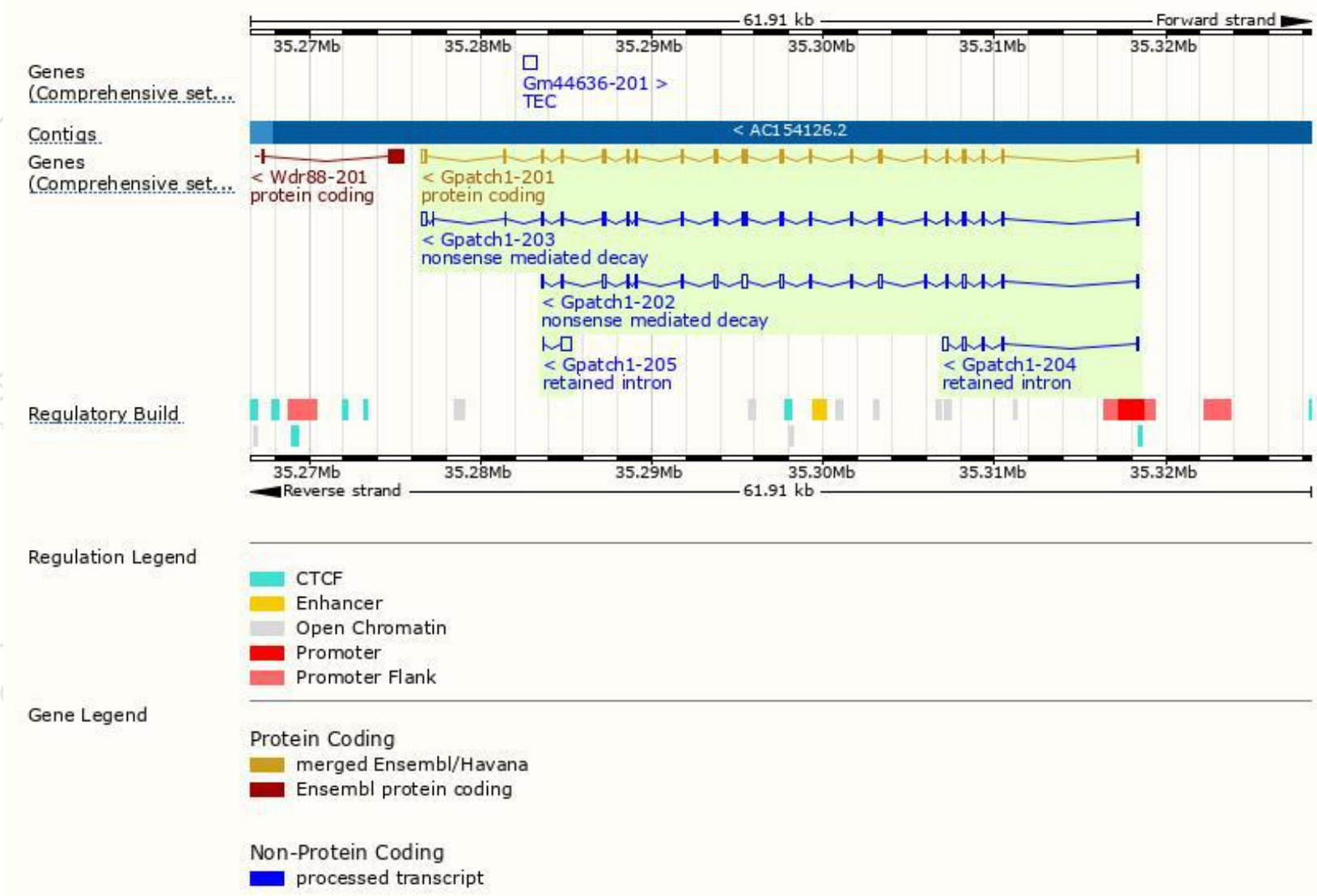
The gene has 5 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Gpatch1-201	ENSMUST00000079693.11	3065	930aa	Protein coding	CCDS21147	Q9DBM1	TSL:1 GENCODE basic APPRIS P1
Gpatch1-203	ENSMUST00000131213.7	2991	883aa	Nonsense mediated decay	-	D6RET6	TSL:1
Gpatch1-202	ENSMUST00000131143.1	2584	98aa	Nonsense mediated decay	-	D6RJ67	TSL:1
Gpatch1-204	ENSMUST00000153778.2	694	No protein	Retained intron	-	-	TSL:2
Gpatch1-205	ENSMUST00000206758.1	621	No protein	Retained intron	-	-	TSL:2

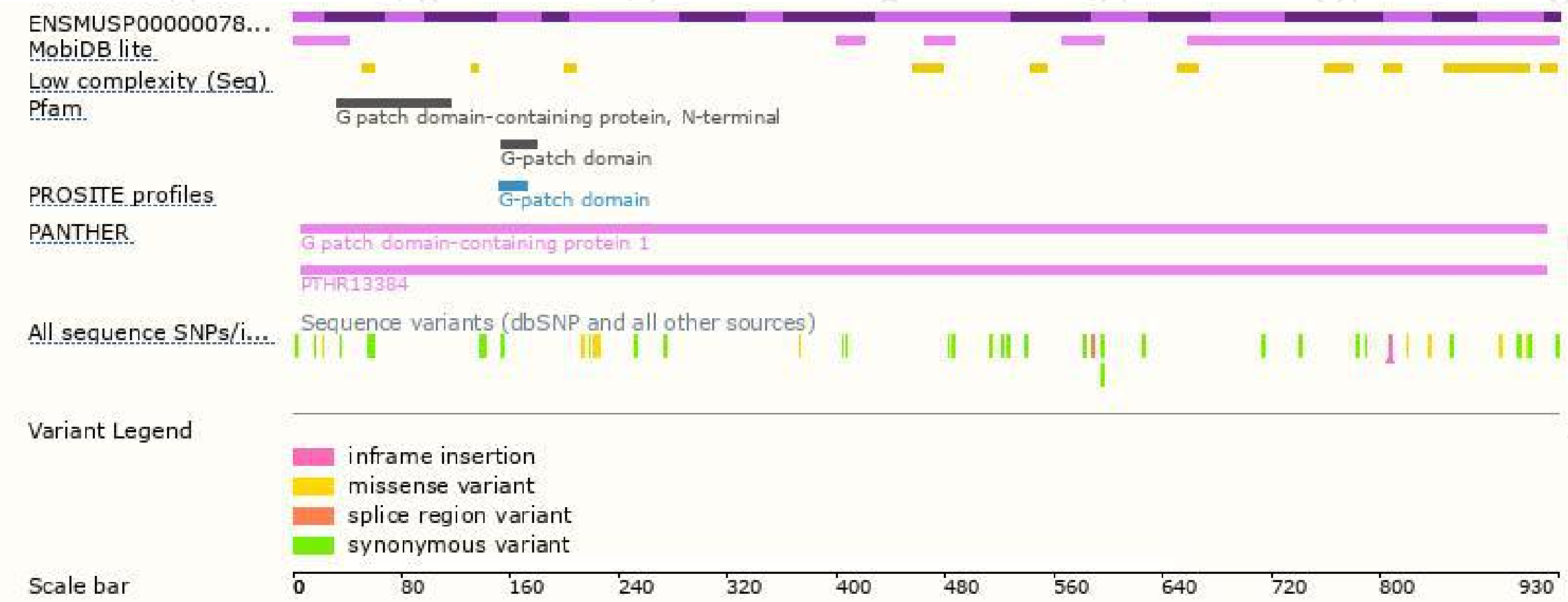
The strategy is based on the design of *Gpatch1-201* transcript,the transcription is shown below:



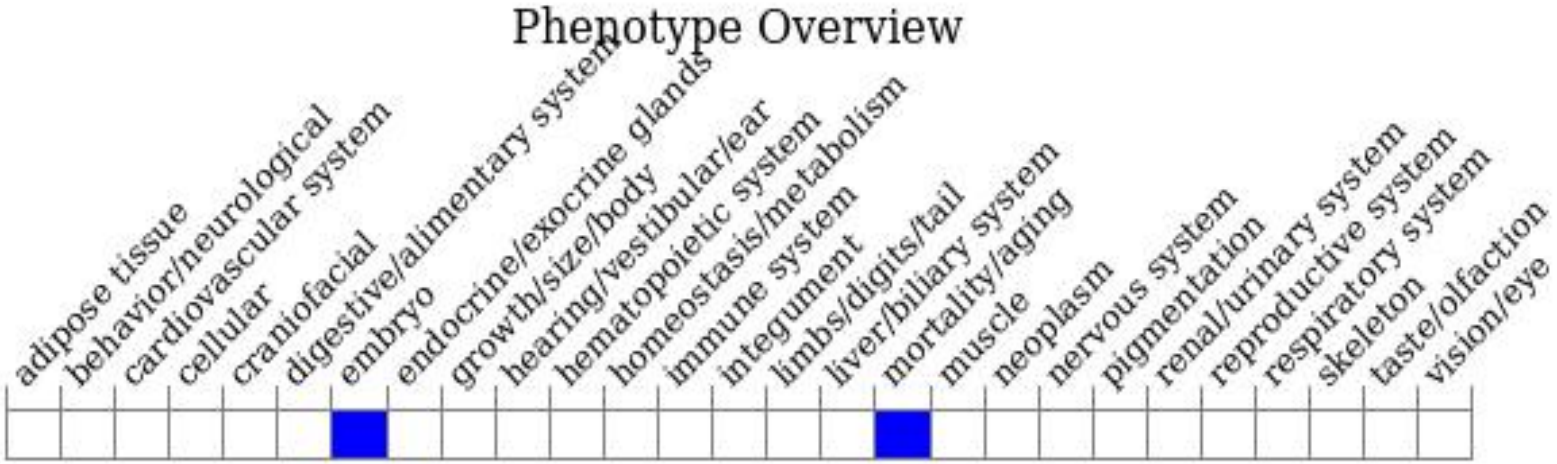
Genomic location distribution



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,mice homozygous for a knock-out allele exhibit defects in placentation with abnormal trophoblast layer formation and complete lethality throughout fetal growth and development.

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

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