

***Col19a1* Cas9-CKO Strategy**

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Project Overview

Project Name

Col19a1

Project type

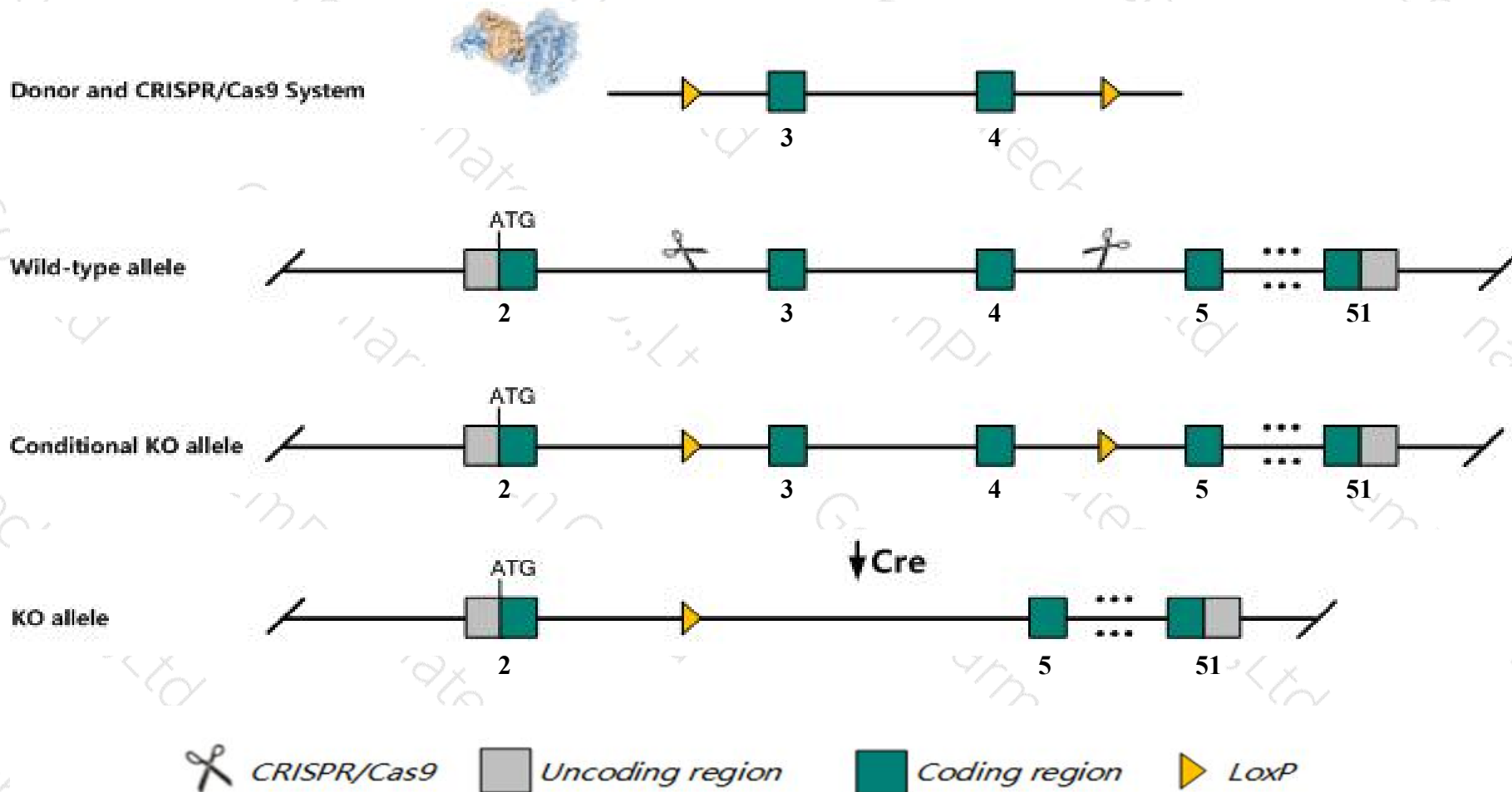
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Coll9a1* gene. The schematic diagram is as follows:



- The *Coll9a1* gene has 3 transcripts. According to the structure of *Coll9a1* gene, exon3-exon4 of *Coll9a1*-202 (ENSMUST00000115244.8) transcript is recommended as the knockout region. The region contains 166bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Coll9a1* 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.

- According to the existing MGI data, Homozygous null mice display postnatal lethality resulting from impaired swallowing, abnormal esophageal muscle development, and impaired muscle relaxation.
- The *Coll9a1* gene is located on the Chr1. 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)

Col19a1 collagen, type XIX, alpha 1 [*Mus musculus* (house mouse)]

Gene ID: 12823, updated on 10-Oct-2019

Summary

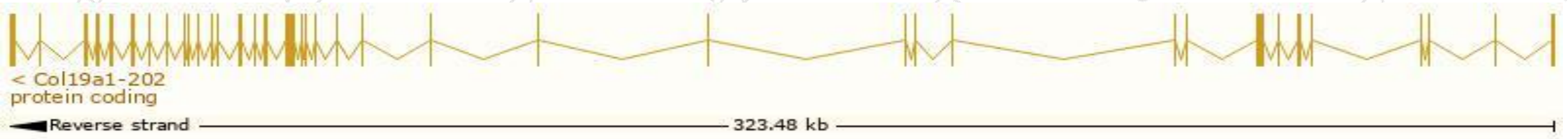
Official Symbol	Col19a1 provided by MGI
Official Full Name	collagen, type XIX, alpha 1 provided by MGI
Primary source	MGI:MGI:1095415
See related	Ensembl:ENSMUSG00000026141
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Expression	Biased expression in cortex adult (RPKM 2.9), frontal lobe adult (RPKM 2.4) and 6 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

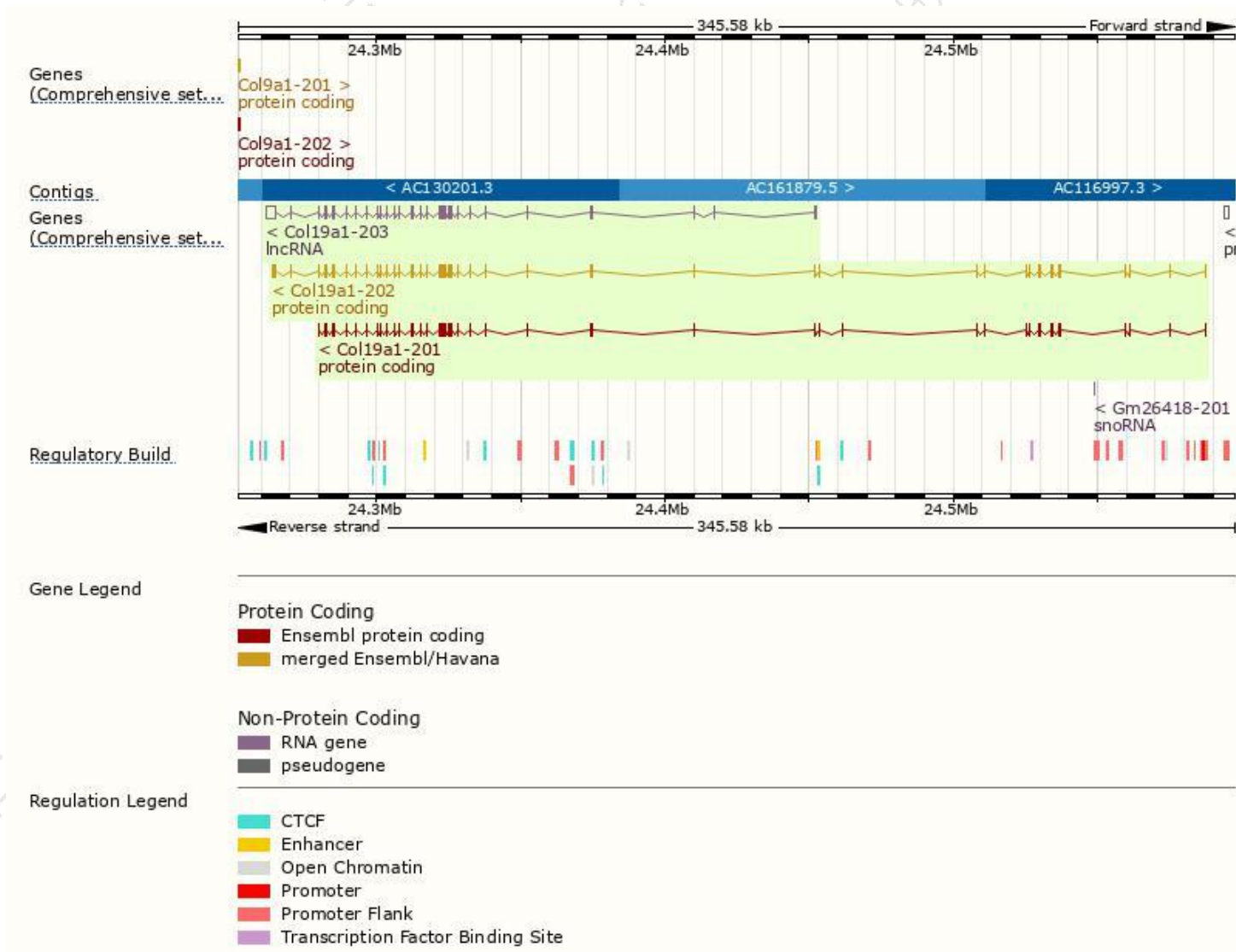
The gene has 3 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Col19a1-202	ENSMUST00000115244.8	4266	1136aa	Protein coding	CCDS14854	Q0VF58	TSL:1 GENCODE basic APPRIS P1
Col19a1-201	ENSMUST00000051344.5	3336	1069aa	Protein coding	-	F8WHV4	TSL:1 GENCODE basic
Col19a1-203	ENSMUST00000144297.1	5441	No protein	lncRNA	-	-	TSL:1

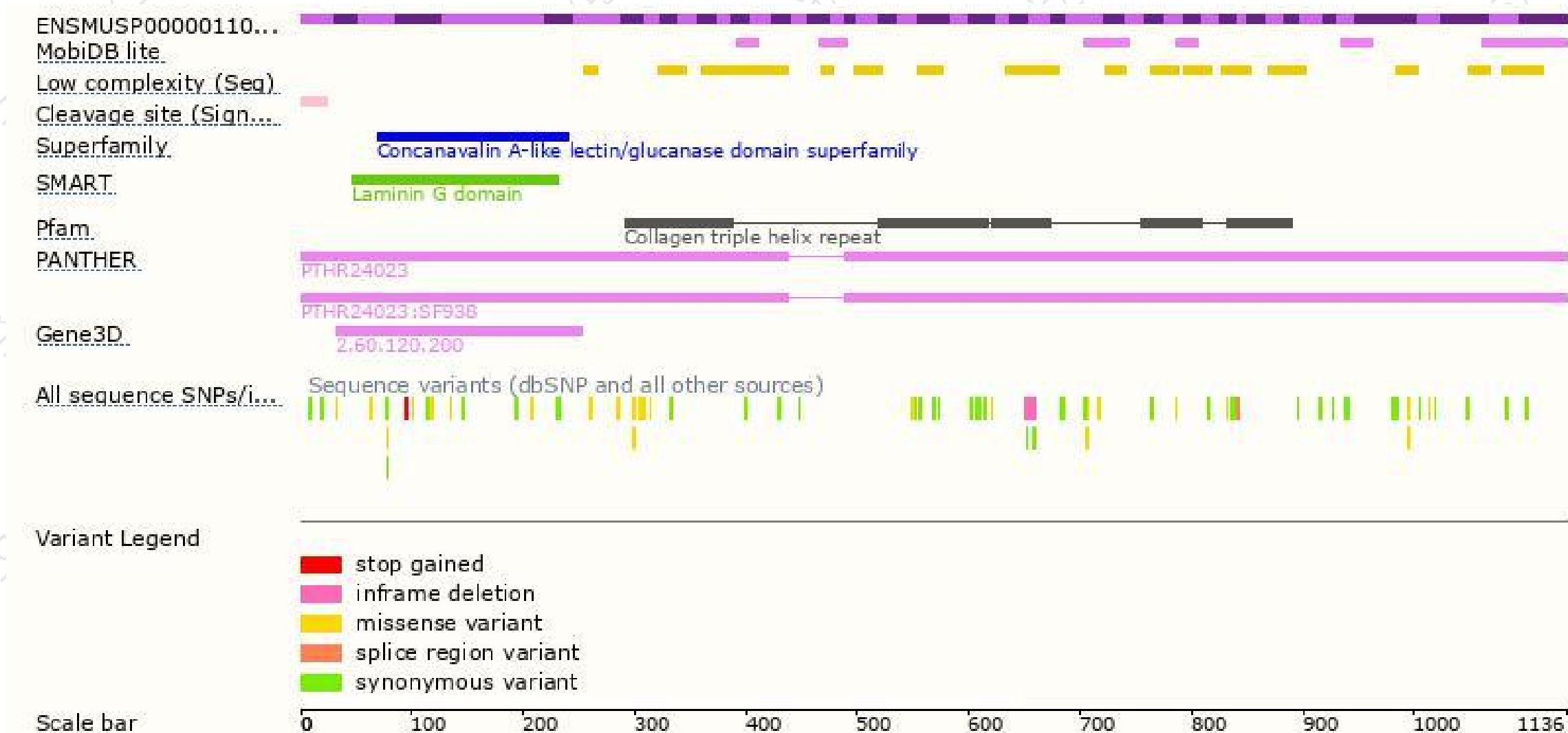
The strategy is based on the design of *Col19a1-202* transcript,The transcription is shown below



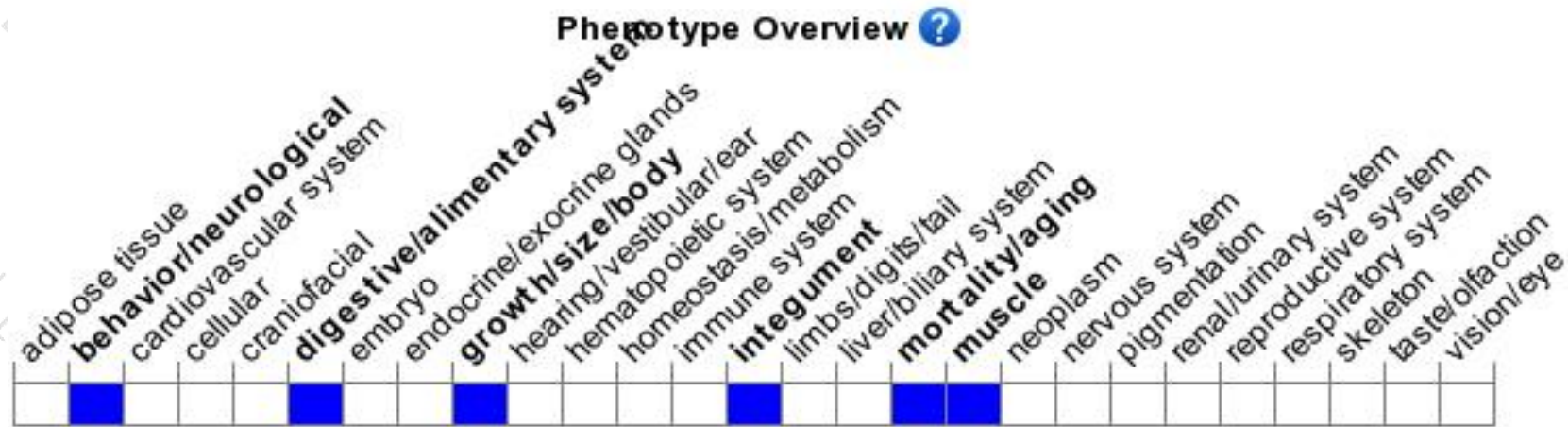
Genomic location distribution



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 null mice display postnatal lethality resulting from impaired swallowing, abnormal esophageal muscle development, and impaired muscle relaxation.

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

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