

Col24a1 Cas9-CKO Strategy

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Reviewer:

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Design Date:

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Project Overview

Project Name

Col24a1

Project type

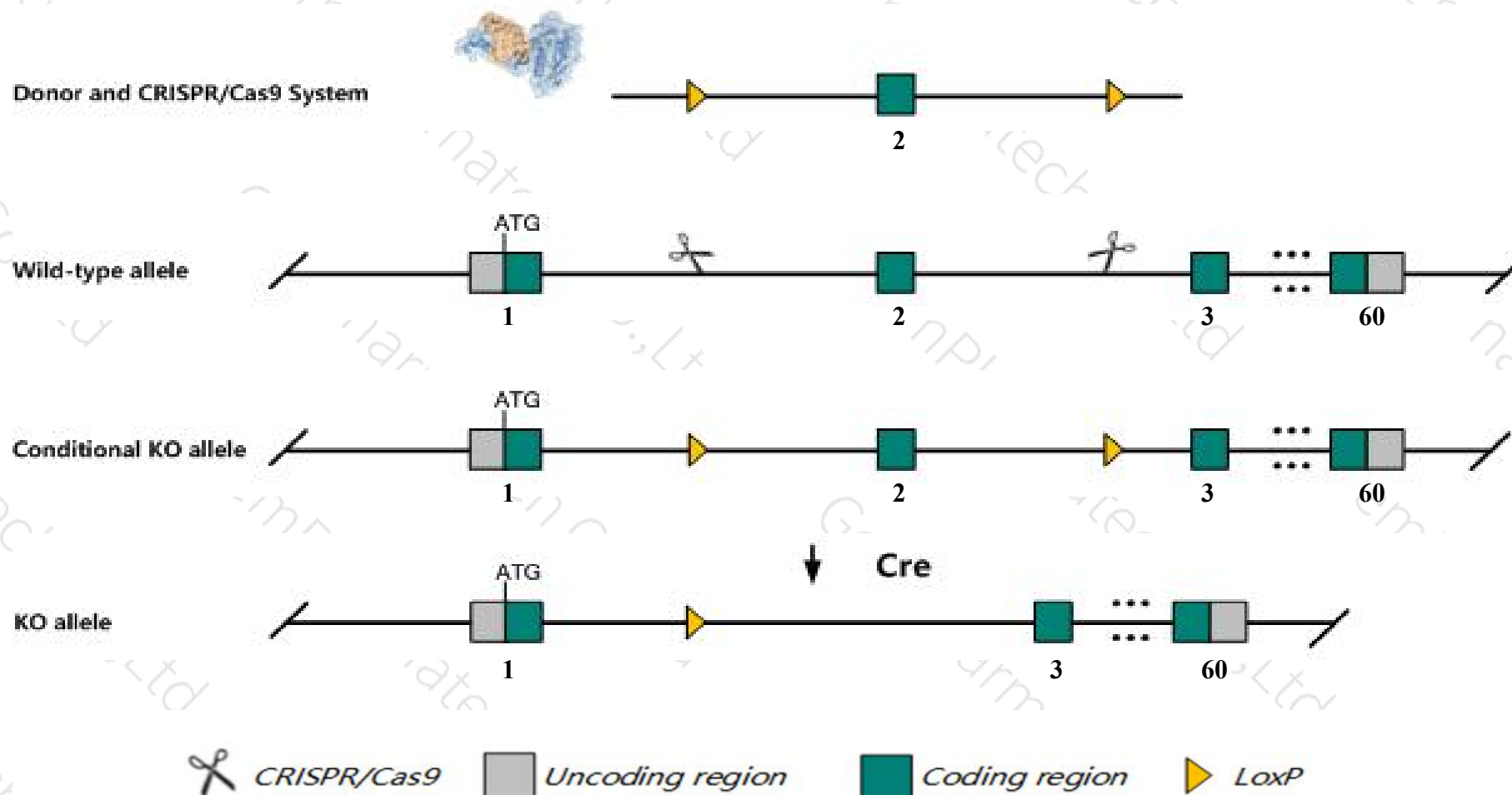
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Col24a1* gene. The schematic diagram is as follows:



Technical routes

- The *Col24a1* gene has 4 transcripts. According to the structure of *Col24a1* gene, exon2 of *Col24a1-201* (ENSMUST00000029848.4) transcript is recommended as the knockout region. The region contains 65bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Col24a1* 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

- The *Col24a1* gene is located on the Chr3. 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)

Col24a1 collagen, type XXIV, alpha 1 [Mus musculus (house mouse)]

Gene ID: 71355, updated on 3-Feb-2019

Summary



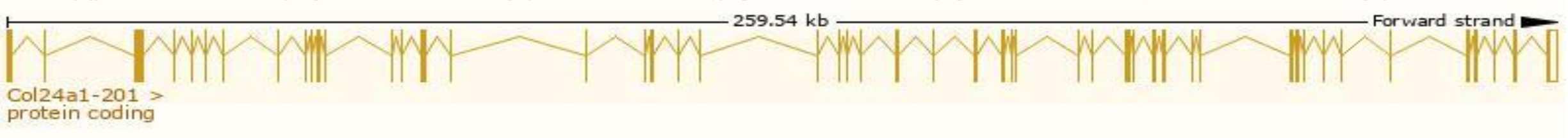
Official Symbol	Col24a1 provided by MGI
Official Full Name	collagen, type XXIV, alpha 1 provided by MGI
Primary source	MGI:MGI:1918605
See related	Ensembl:ENSMUSG00000028197
Gene type	protein coding
RefSeq status	REVIEWED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	5430404K19Rik
Summary	This gene encodes the alpha-1 subunit of type XXIV collagen, one of the low abundance fibril-forming collagens found in cartilage. The encoded protein has structural features of invertebrate fibrillar collagens and is expressed predominantly in bone tissue. Alternate splicing of this gene results in multiple transcript variants encoding different isoforms. [provided by RefSeq, Dec 2015]
Expression	Biased expression in limb E14.5 (RPKM 3.8), frontal lobe adult (RPKM 3.5) and 7 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

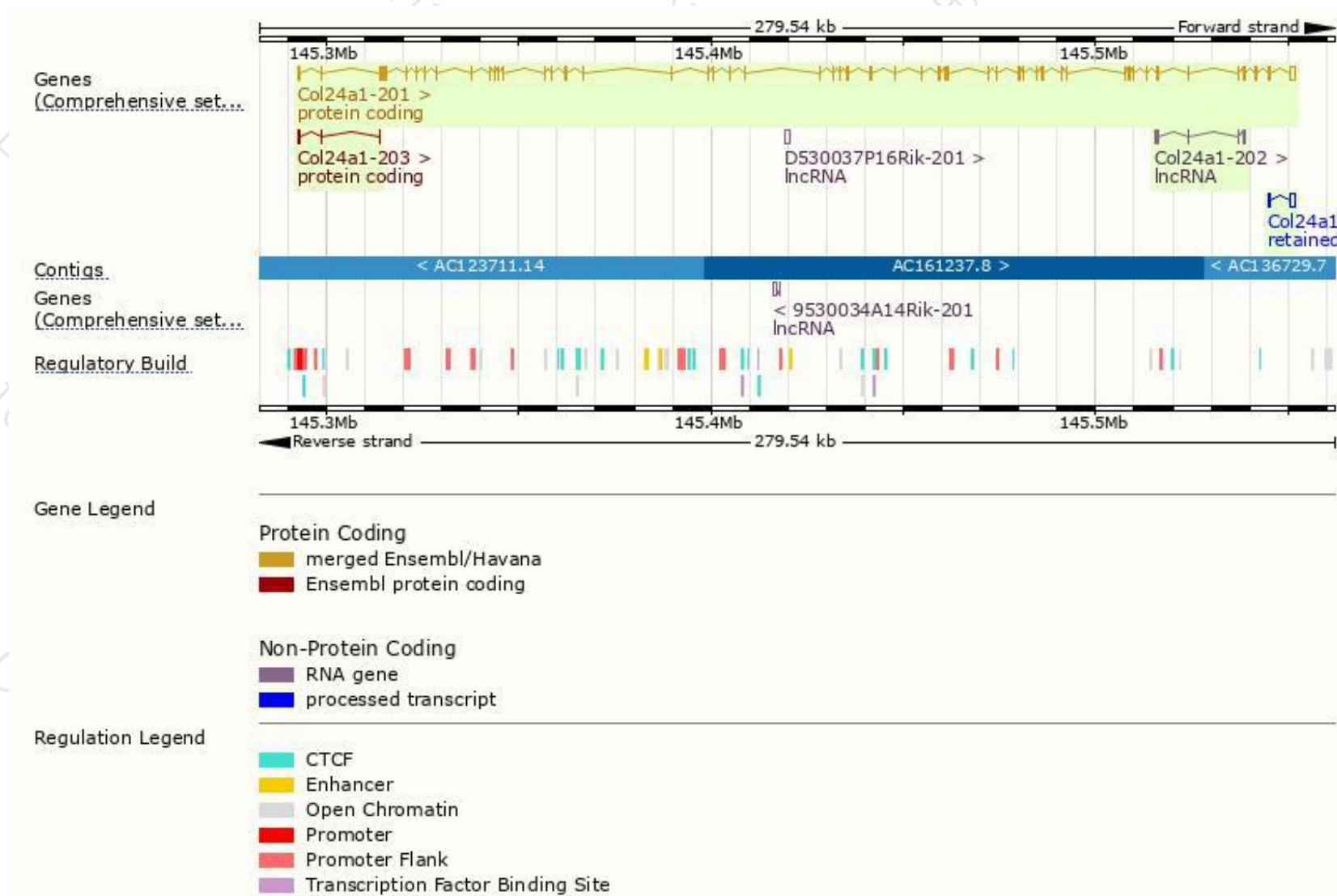
The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Col24a1-201	ENSMUST00000029848.4	7143	1733aa	Protein coding	CCDS17892	Q30D77	TSL:1 GENCODE basic APPRIS P1
Col24a1-203	ENSMUST00000139001.1	330	62aa	Protein coding	-	D3Z1L7	CDS 3' incomplete TSL:3
Col24a1-204	ENSMUST00000142441.1	1777	No protein	Retained intron	-	-	TSL:1
Col24a1-202	ENSMUST00000127379.1	620	No protein	lncRNA	-	-	TSL:3

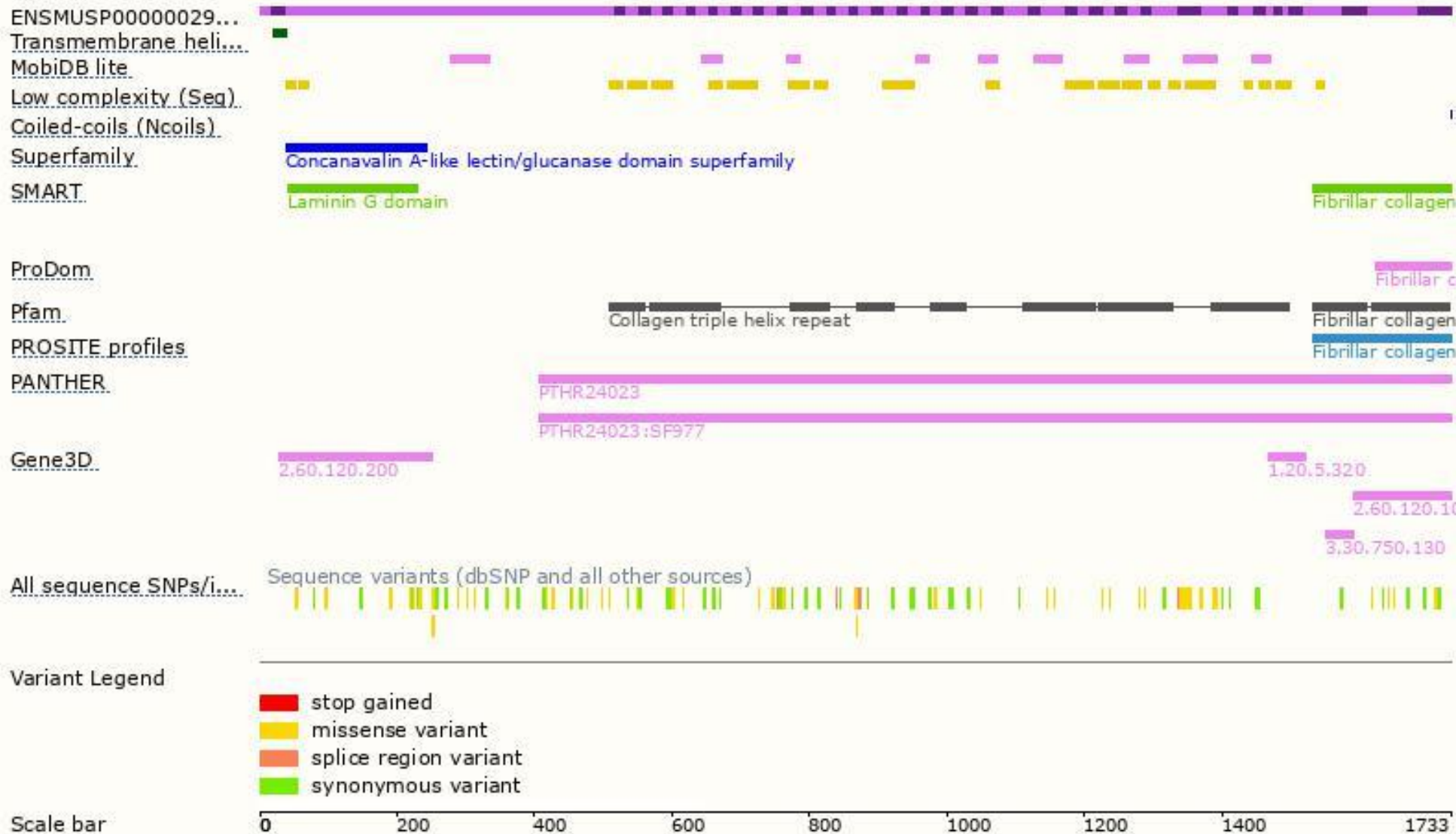
The strategy is based on the design of *Col24a1-201* transcript,The transcription is shown below



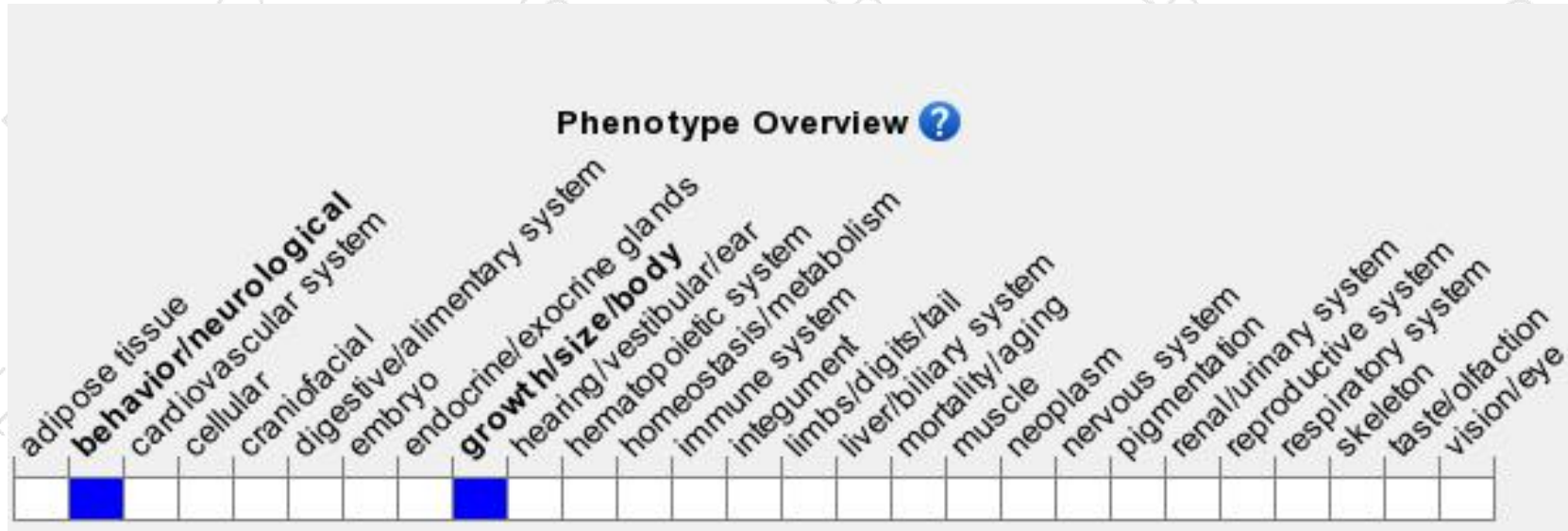
Genomic location distribution



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/>).

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

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