Lmx1a Cas9-KO Strategy

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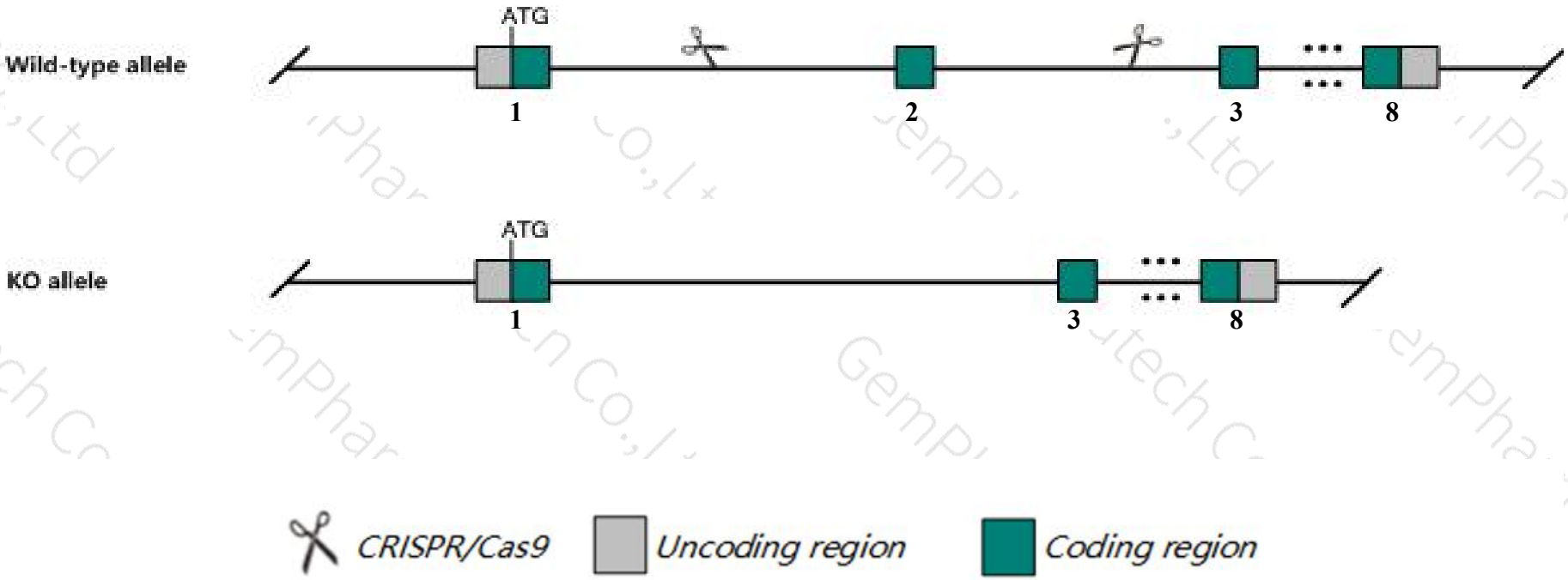
Project Overview

Project Name	***Lmx1a***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Lmx1a* gene. The schematic diagram is as follows:



Technical routes

➢ The *Lmx1a* gene has 2 transcripts. According to the structure of *Lmx1a* gene, exon2 of *Lmx1a-201* (ENSMUST00000028003.8) transcript is recommended as the knockout region.The region contains 187bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Lmx1a* gene. The brief process is as follows: CRISPR/Cas9 system

Notice

- According to the existing MGI data,Mutations in the dreher locus produce neurological and skeletal abnormalities, inner ear defects, and belly spotting. Deafness and hypoplasia of Mullerian duct derivatives are also reported for some alleles. Homozygous null mice have fewer dopaminergic neurons.

- The *Lmx1a* 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 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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Lmx1a LIM homeobox transcription factor 1 alpha [*Mus musculus* (house mouse)]

Gene ID: 110648, updated on 19-Oct-2019

Summary

Official Symbol	Lmx1a provided by MGI
Official Full Name	LIM homeobox transcription factor 1 alpha provided by MGI
Primary source	MGI:MGI:1888519
See related	Ensembl:ENSMUSG00000026686
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	dr; sst; Lmx1.1; dreher
Expression	Biased expression in CNS E11.5 (RPKM 3.7), placenta adult (RPKM 2.2) and 8 other tissues See more
Orthologs	human all

Genomic context

Location: 1 H2.3; 1 75.08 cM

See Lmx1a in Genome Data Viewer

Exon count: 10

Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	1	NC_000067.6 (167688230..167848741)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	1	NC_000067.5 (169619689..169778864)

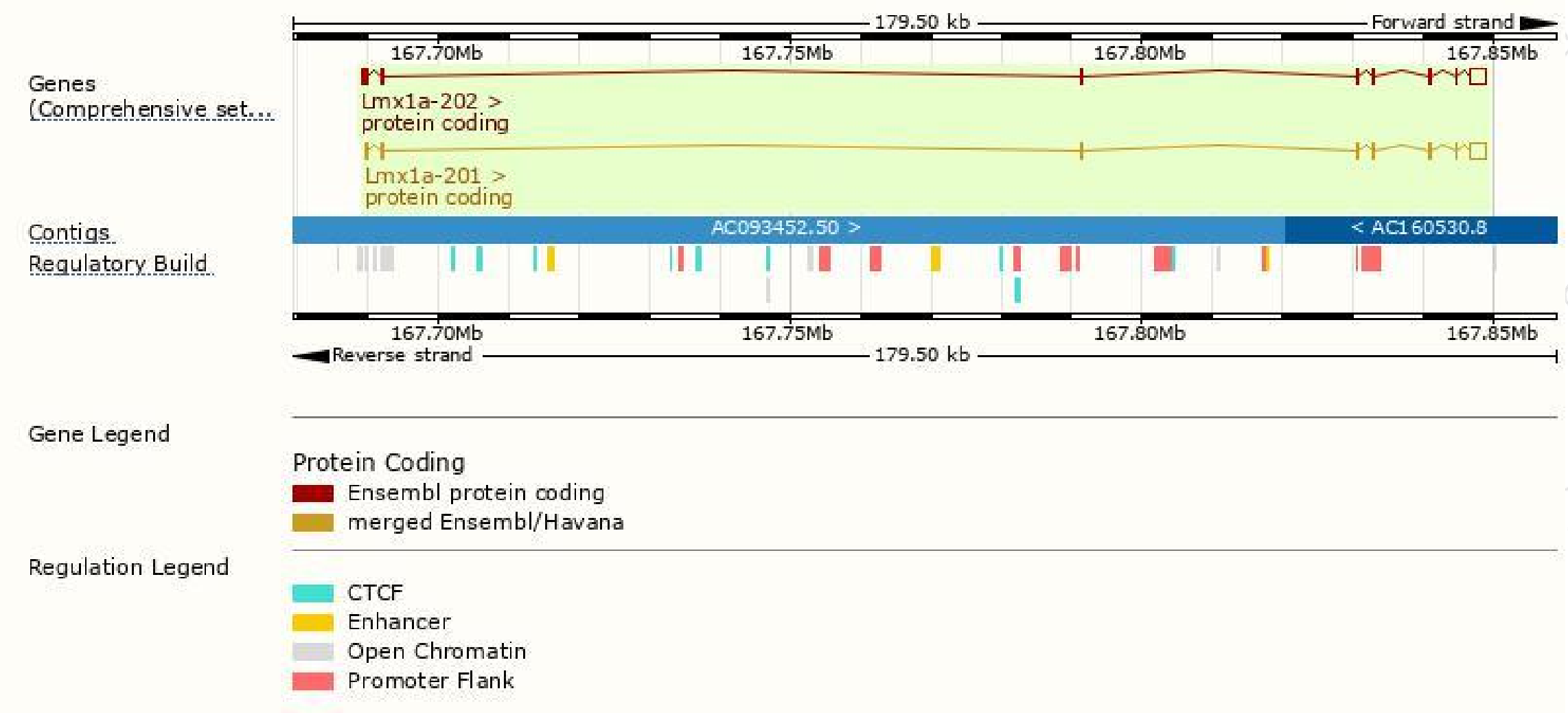
Transcript information（Ensembl）

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

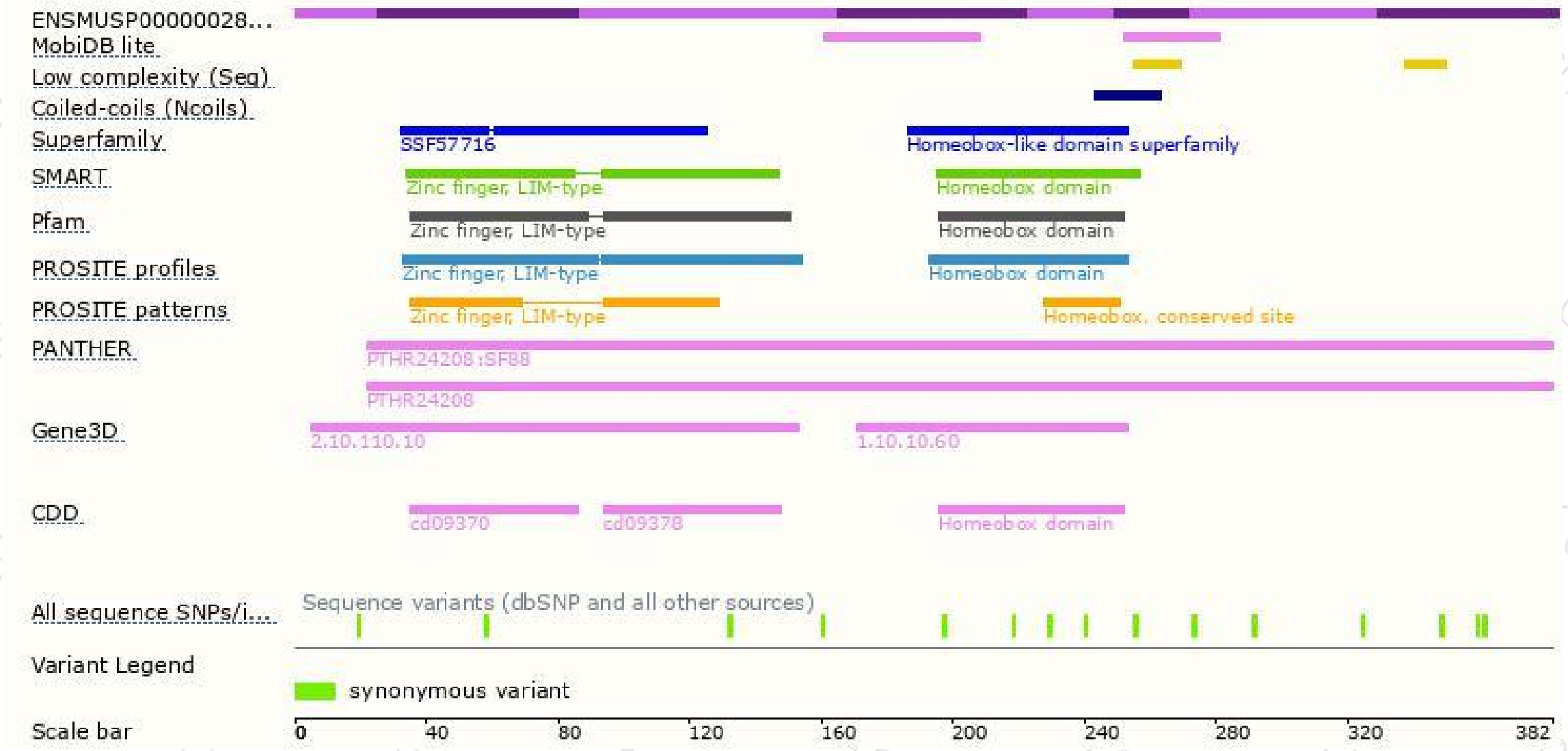
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Lmx1a-201	ENSMUST00000028003.8	3347	382aa	Protein coding	CCDS15460	Q543W2 Q9JKU8	TSL:1 GENCODE basic APPRIS P1
Lmx1a-202	ENSMUST00000111377.7	3200	382aa	Protein coding	CCDS15460	Q543W2 Q9JKU8	TSL:5 GENCODE basic APPRIS P1

The strategy is based on the design of *Lmx1a-201* transcript,The transcription is shown below

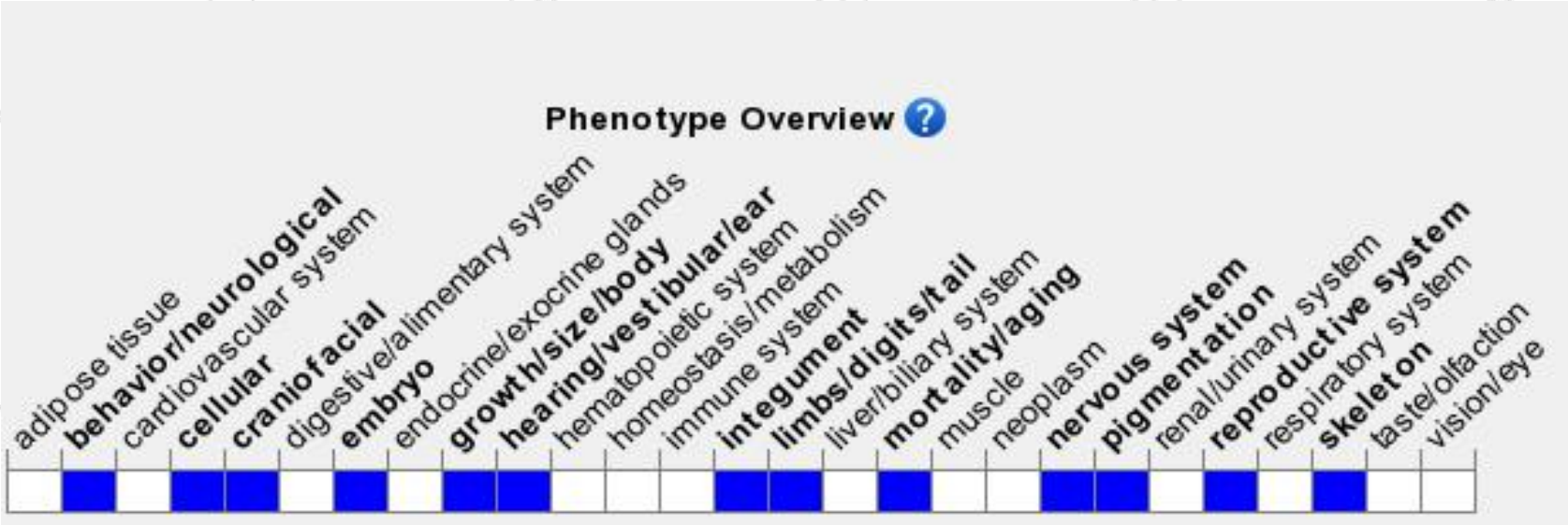
Genomic location distribution



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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