Chrna7 Cas9-KO Strategy

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Reviewer: Huimin Su

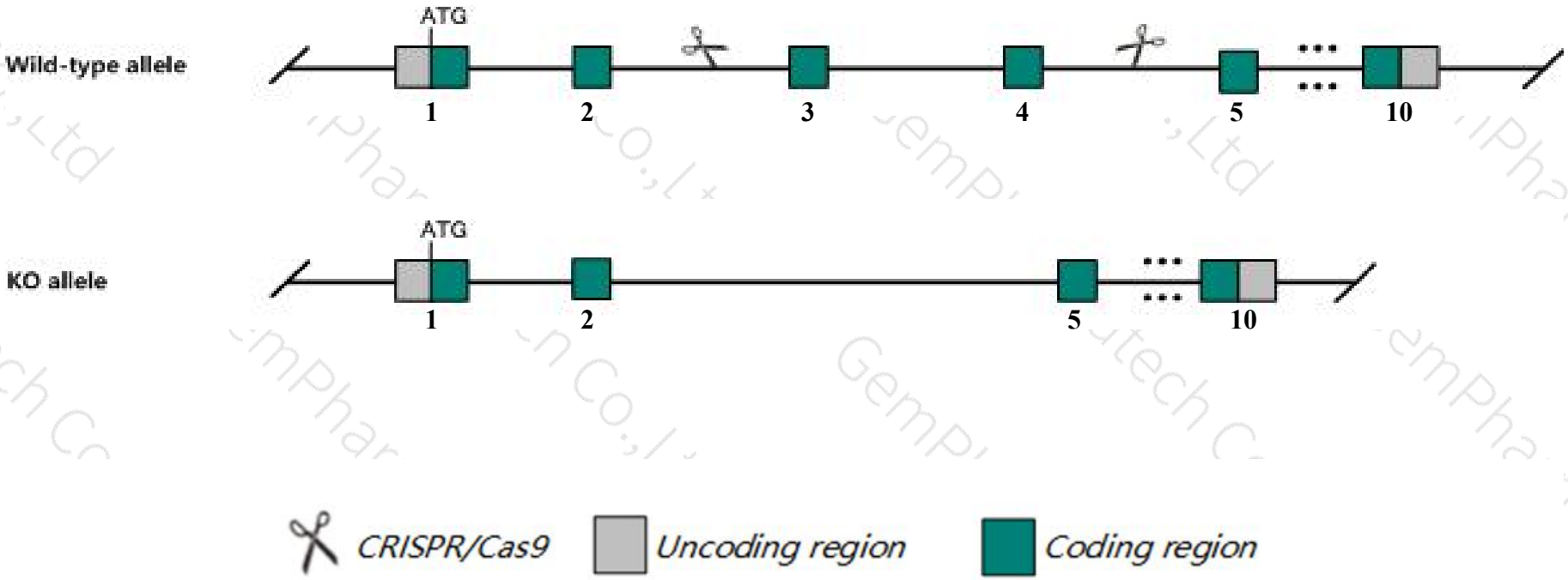
Design Date: 2019-9-28

Project Overview

Project Name	***Chrna7***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Chrna7* gene. The schematic diagram is as follows:



Technical routes

➢ The *Chrna7* gene has 2 transcripts. According to the structure of *Chrna7* gene, exon3-exon4 of *Chrna7-201* (ENSMUST00000032738.6) transcript is recommended as the knockout region.The region contains 155bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Chrna7* gene. The brief process is as follows: CRISPR/Cas9 syster

Notice

- According to the existing MGI data,Nullizygous mice lack hippocampal fast nicotinic currents but show nicotine-induced seizures as well as altered anxiety behavior, fertility defects, airway basal cell hyperplasia. and higher TNF sythesis when endotoxemic. Newborns homozygous for a knock-in allele die with increased neuron apoptosis.

- The *Chrna7* 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 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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Chrna7 cholinergic receptor, nicotinic, alpha polypeptide 7 [Mus musculus (house mouse)]

Gene ID: 11441, updated on 12-Mar-2019

Summary

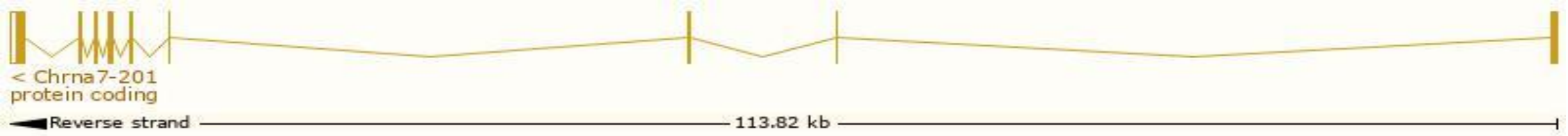
Official Symbol	Chrna7 provided by MGI
Official Full Name	cholinergic receptor, nicotinic, alpha polypeptide 7 provided by MGI
Primary source	MGI:MGI:99779
See related	Ensembl:ENSMUSG00000030525
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Acra7, alpha7, nAchR
Expression	Biased expression in adrenal adult (RPKM 6.7), CNS E18 (RPKM 3.8) and 10 other tissues See more

Transcript information（Ensembl）

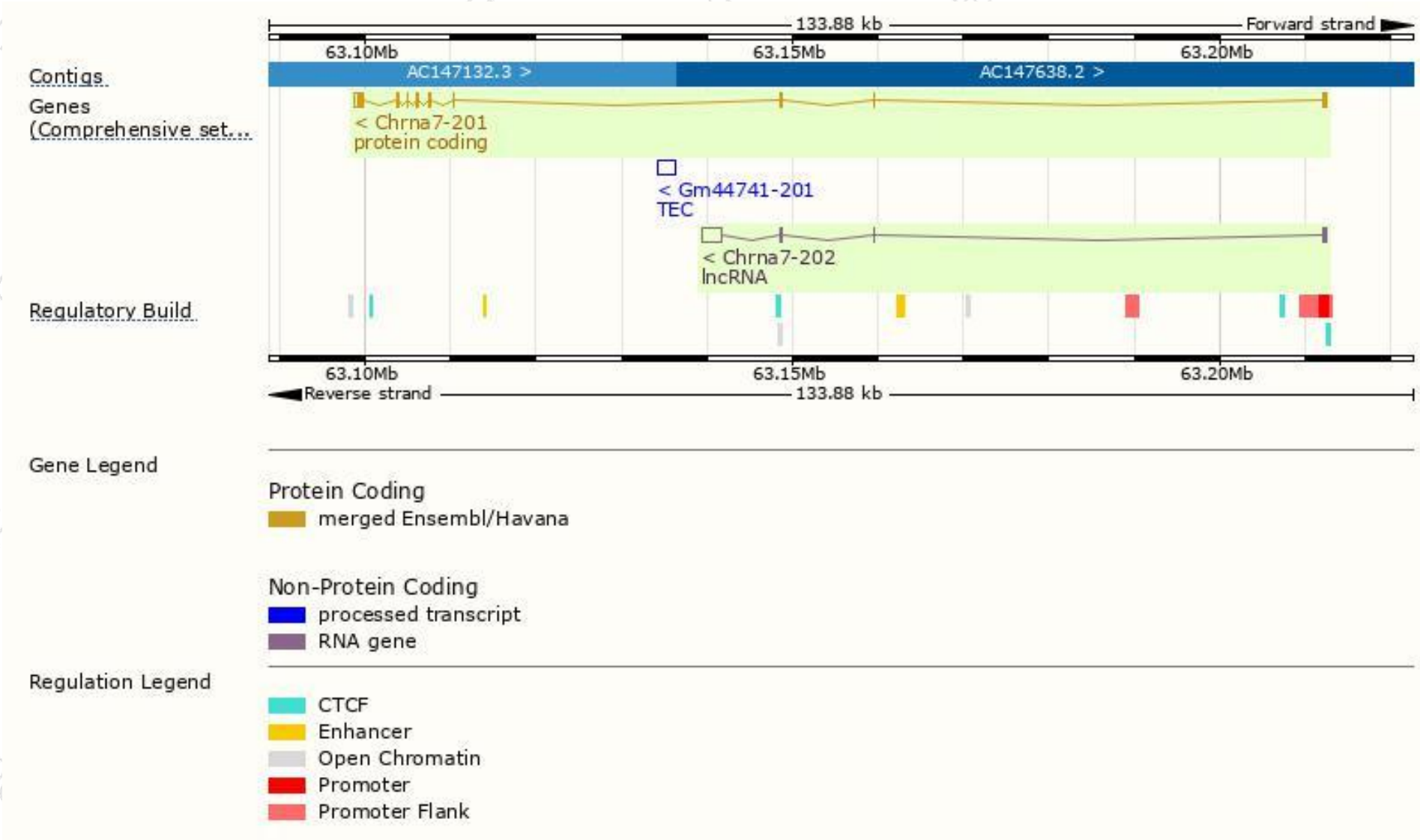
The gene has 2 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Chrna7-201	ENSMUST00000032738.6	2078	502aa	Protein coding	CCDS21329	P49582 Q53YJ9	TSL:1 GENCODE basic APPRIS P1
Chrna7-202	ENSMUST00000208304.1	2814	No protein	Processed transcript	-	-	TSL:1

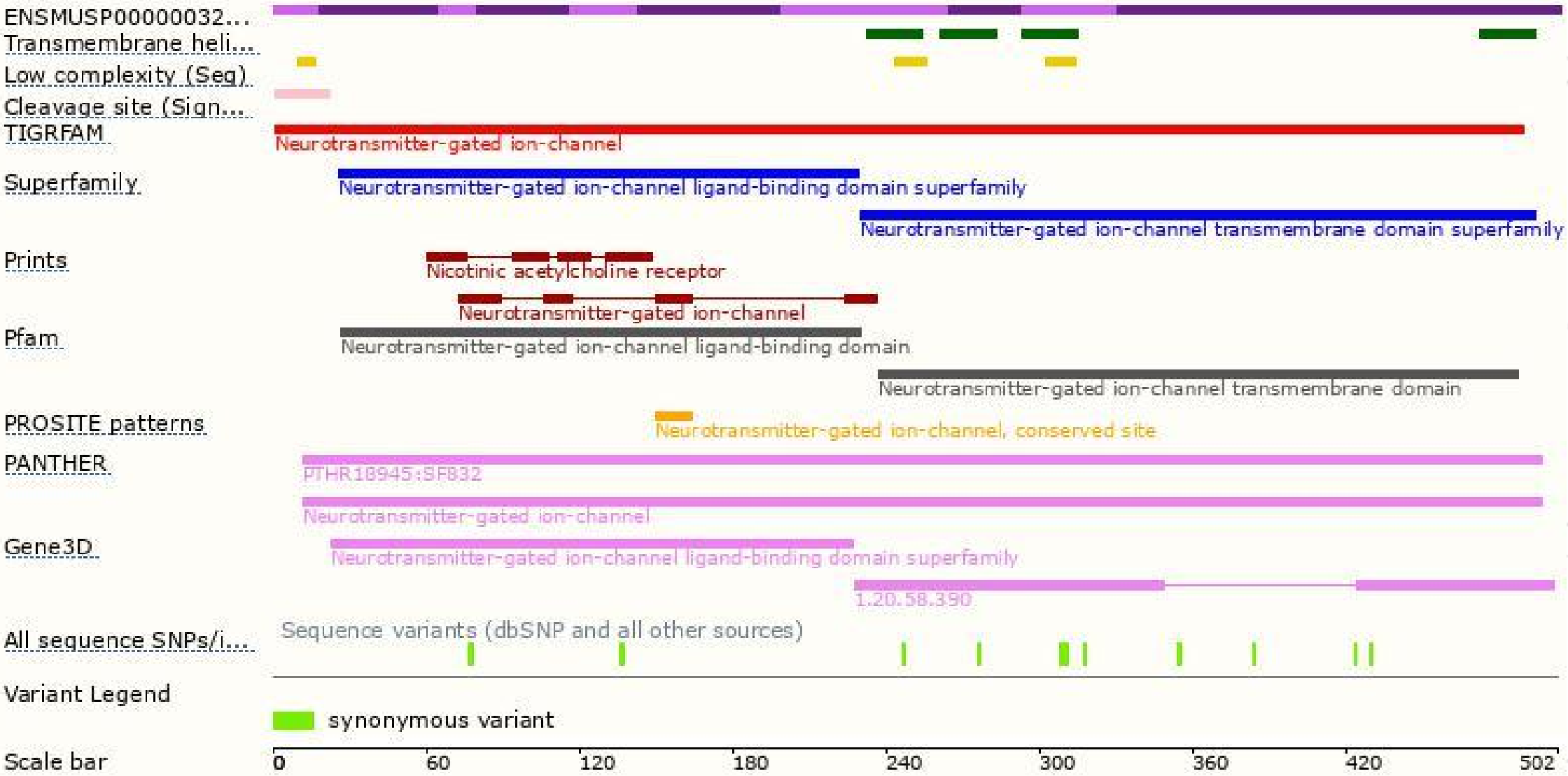
The strategy is based on the design of *Chrna7-201* transcript,The transcription is shown below



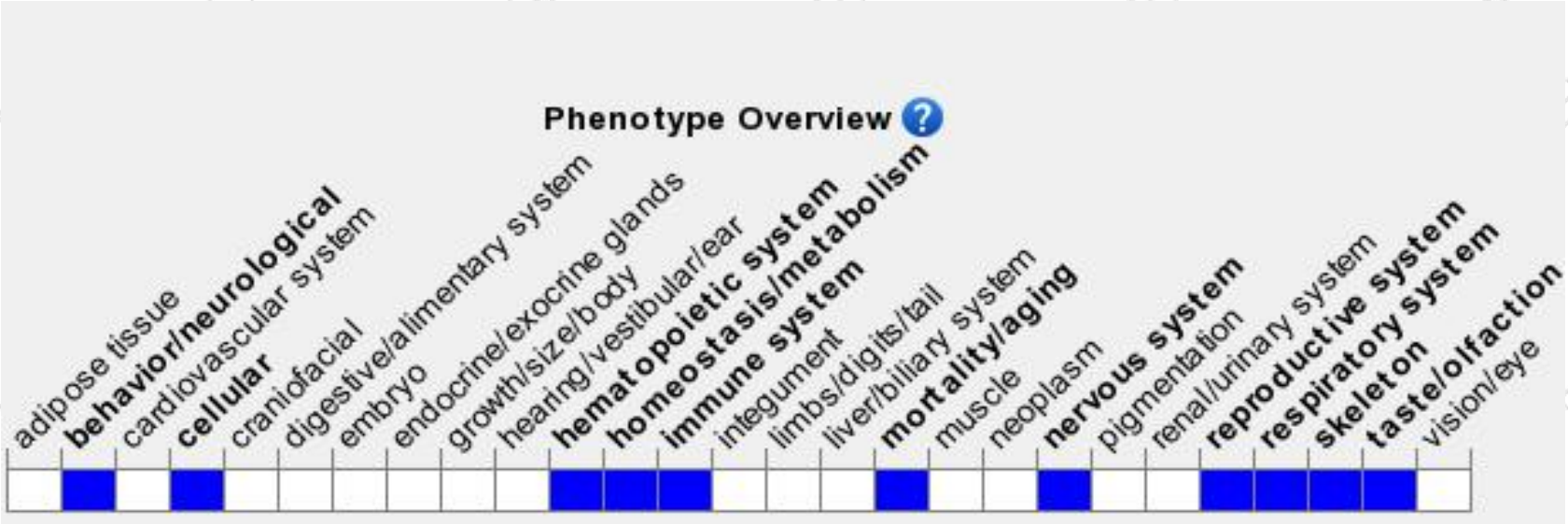
Genomic location distribution



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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