Nkx6-2 Cas9-KO Strategy

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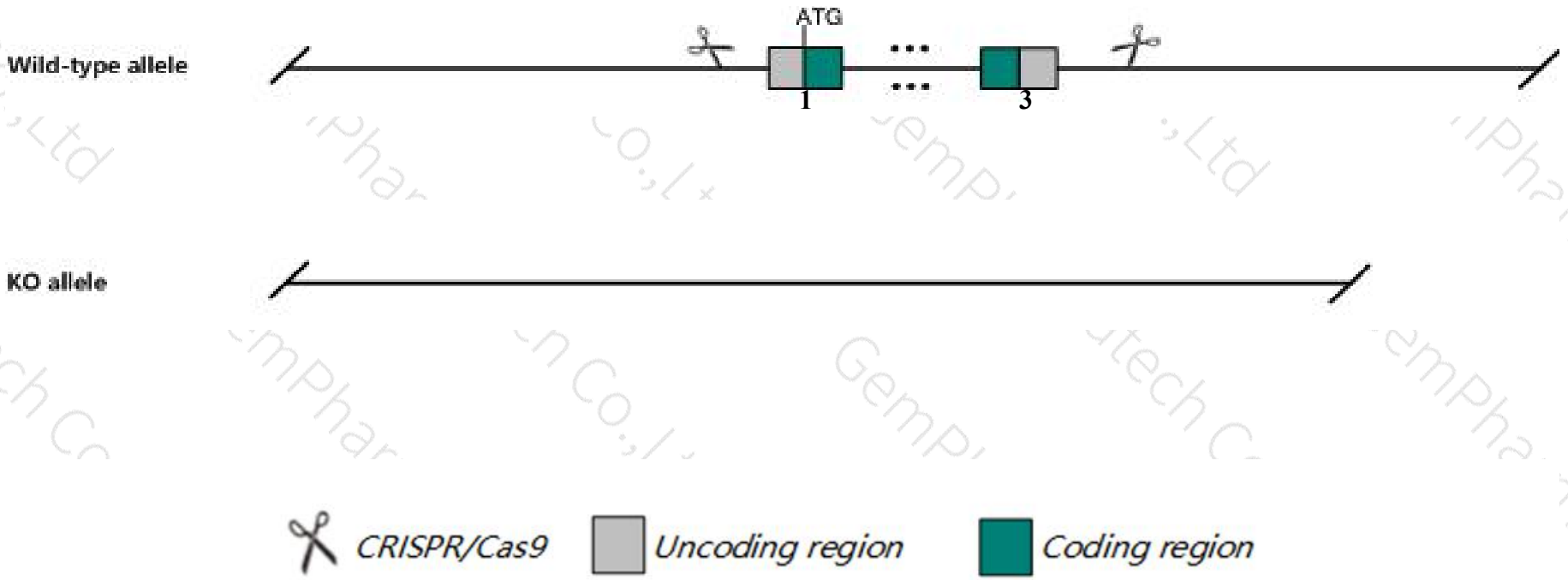
Project Overview

Project Name	***Nkx6-2***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Nkx6-2* gene. The schematic diagram is as follows:



Technical routes

➢ The *Nkx6-2* gene has 2 transcripts. According to the structure of *Nkx6-2* gene, exon1-exon3 of *Nkx6-2-202* (ENSMUST00000106095.2) transcript is recommended as the knockout region.The region contains all of the coding sequence.Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Nkx6-2* gene. The brief process is as follows: CRISPR/Cas9 systen

Notice

- According to the existing MGI data,Mice homozygous for a knock-out allele exhibit impaired coordination at 6 weeks of age and axon degeneration in the optic nerve at 7 months of age.
- The knockout region is near to the C-terminal of and Inpp5a gene,this strategy may influence the regulatory function of the C-terminal of and Inpp5a gene.
- The *Nkx6-2* 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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Nkx6-2 NK6 homeobox 2 [*Mus musculus* (house mouse)]

Gene ID: 14912, updated on 14-Aug-2019

Summary

Official Symbol	Nkx6-2 provided by MGI
Official Full Name	NK6 homeobox 2 provided by MGI
Primary source	MGI:MGI:1352738
See related	Ensembl:ENSMUSG00000041309
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	Gtx; Nkx6.2
Expression	Broad expression in stomach adult (RPKM 18.8), cerebellum adult (RPKM 13.6) and 19 other tissues See more
Orthologs	human all

Genomic context

Location: 7 F4; 7 84.57 cM

See Nkx6-2 in Genome Data Viewer

Exon count: 4

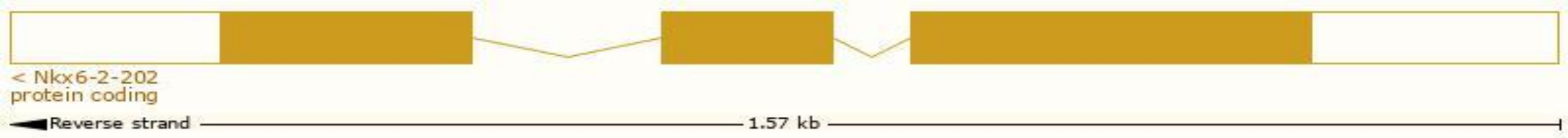
Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	7	NC_000073.6 (139579376..139582797, complement)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	7	NC_000073.5 (146765275..146768696, complement)

Transcript information（Ensembl）

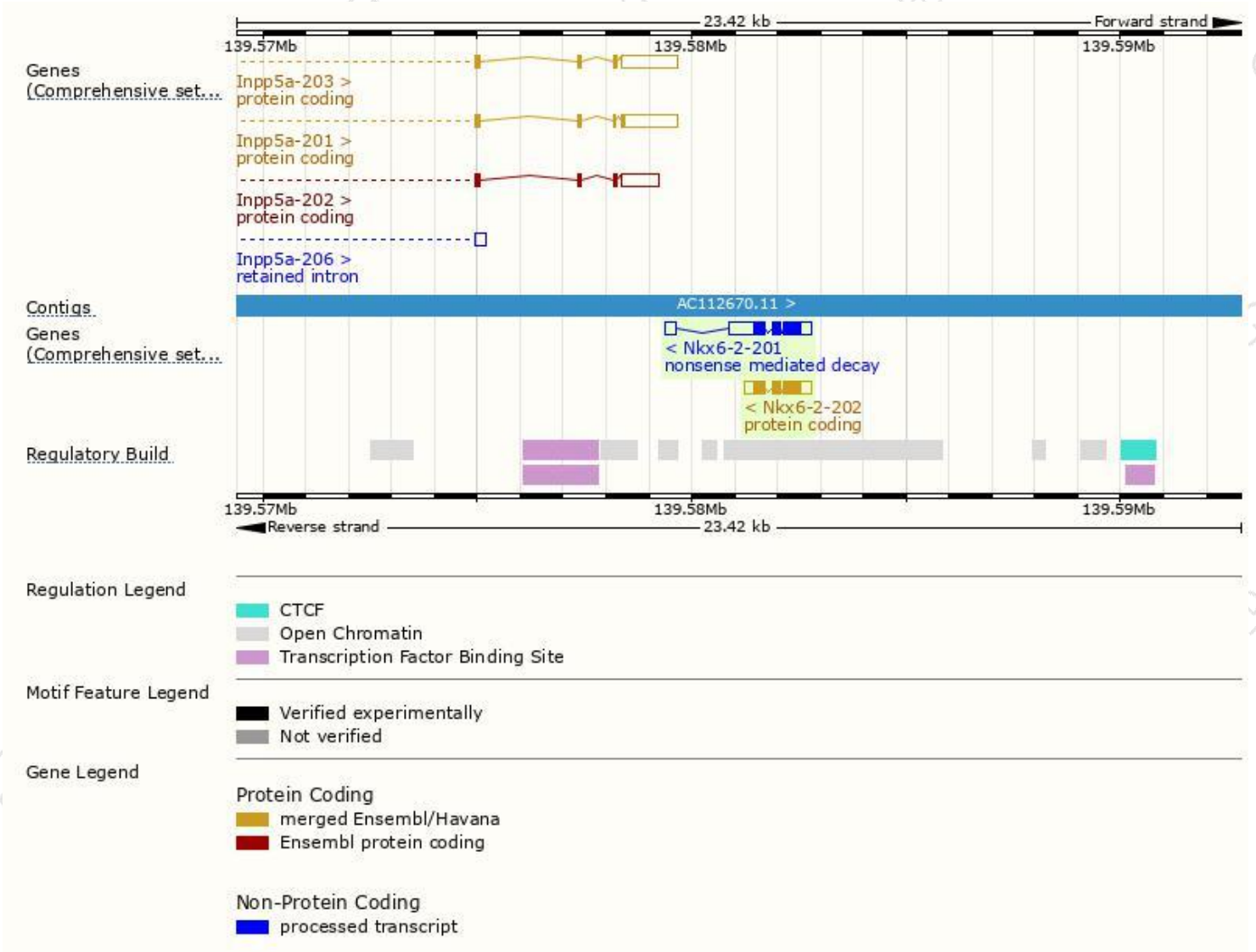
The gene has 2 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Nkx6-2-202	ENSMUST00000106095.2	1299	277aa	Protein coding	CCDS40170	D3Z4R4	TSL:1 GENCODE basic APPRIS P1
Nkx6-2-201	ENSMUST00000097974.8	1907	277aa	Nonsense mediated decay	-	D3Z4R4	TSL:1

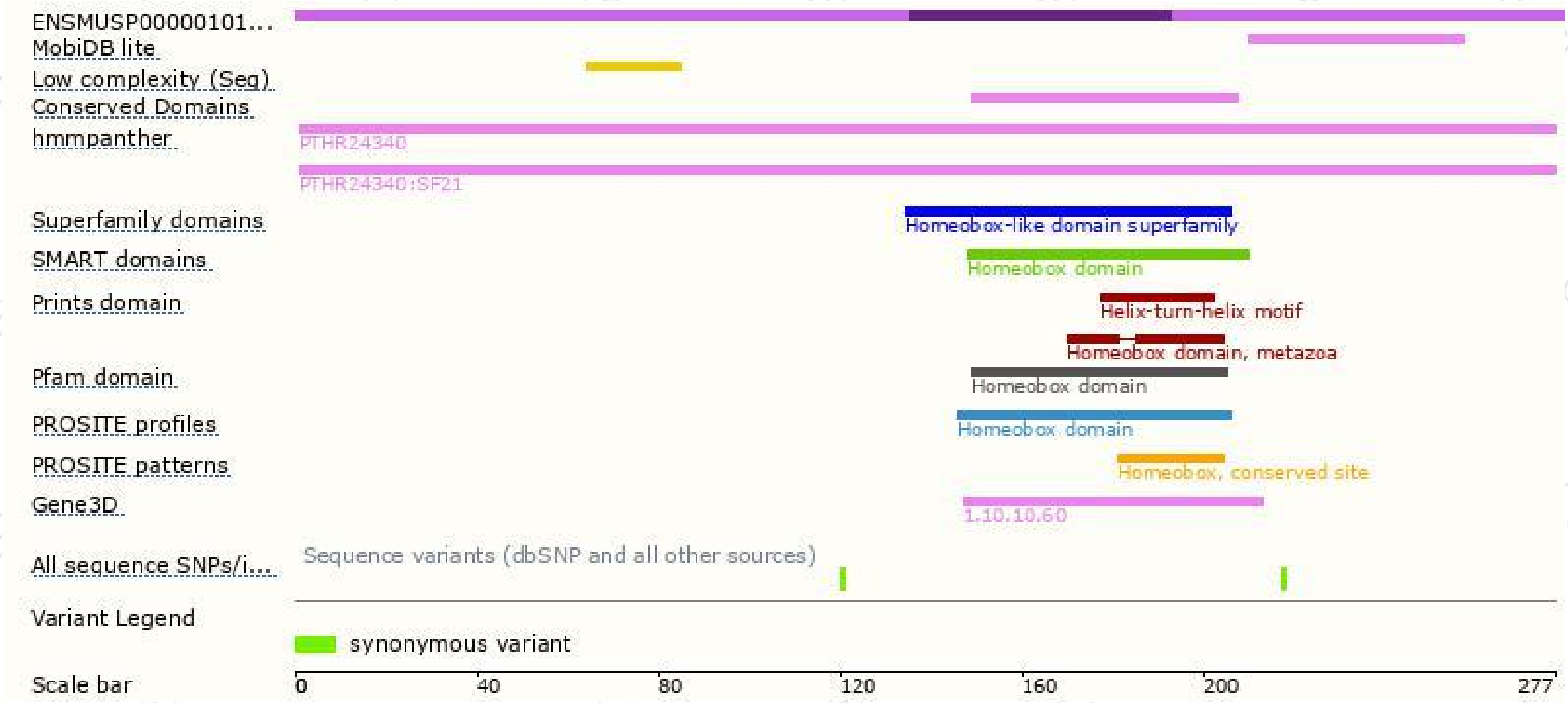
The strategy is based on the design of *Nkx6-2-202* transcript,The transcription is shown below



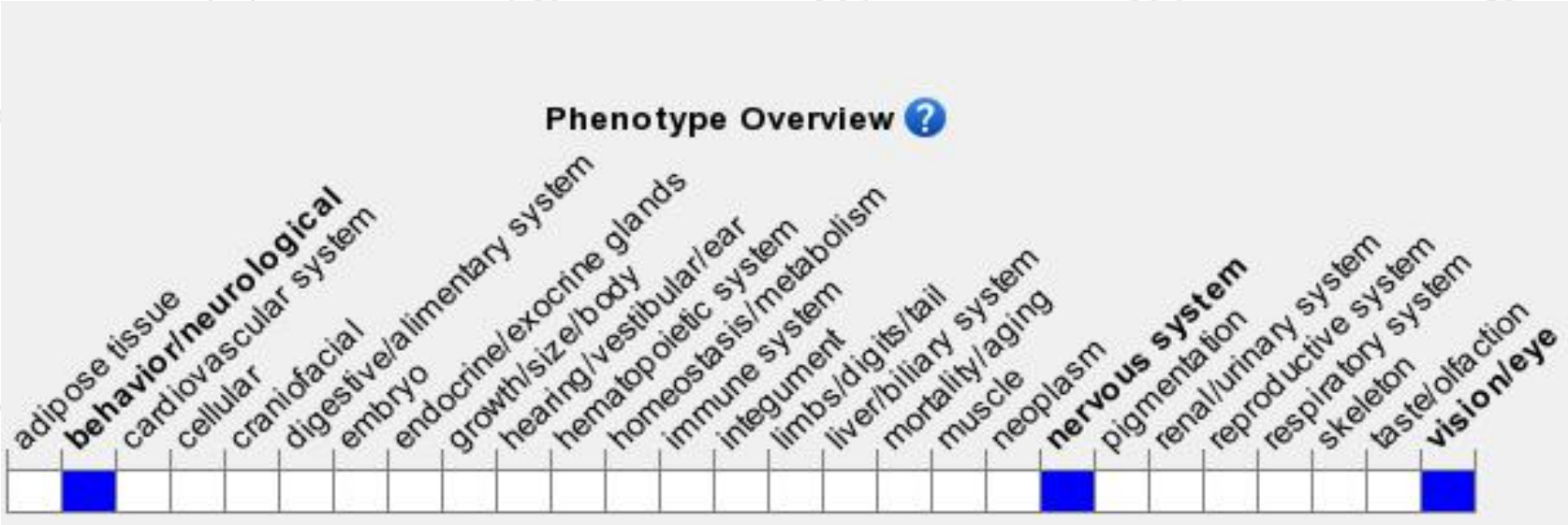
Genomic location distribution



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/).

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

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