

***Bdh2* Cas9-CKO Strategy**

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Project Overview

Project Name

Bdh2

Project type

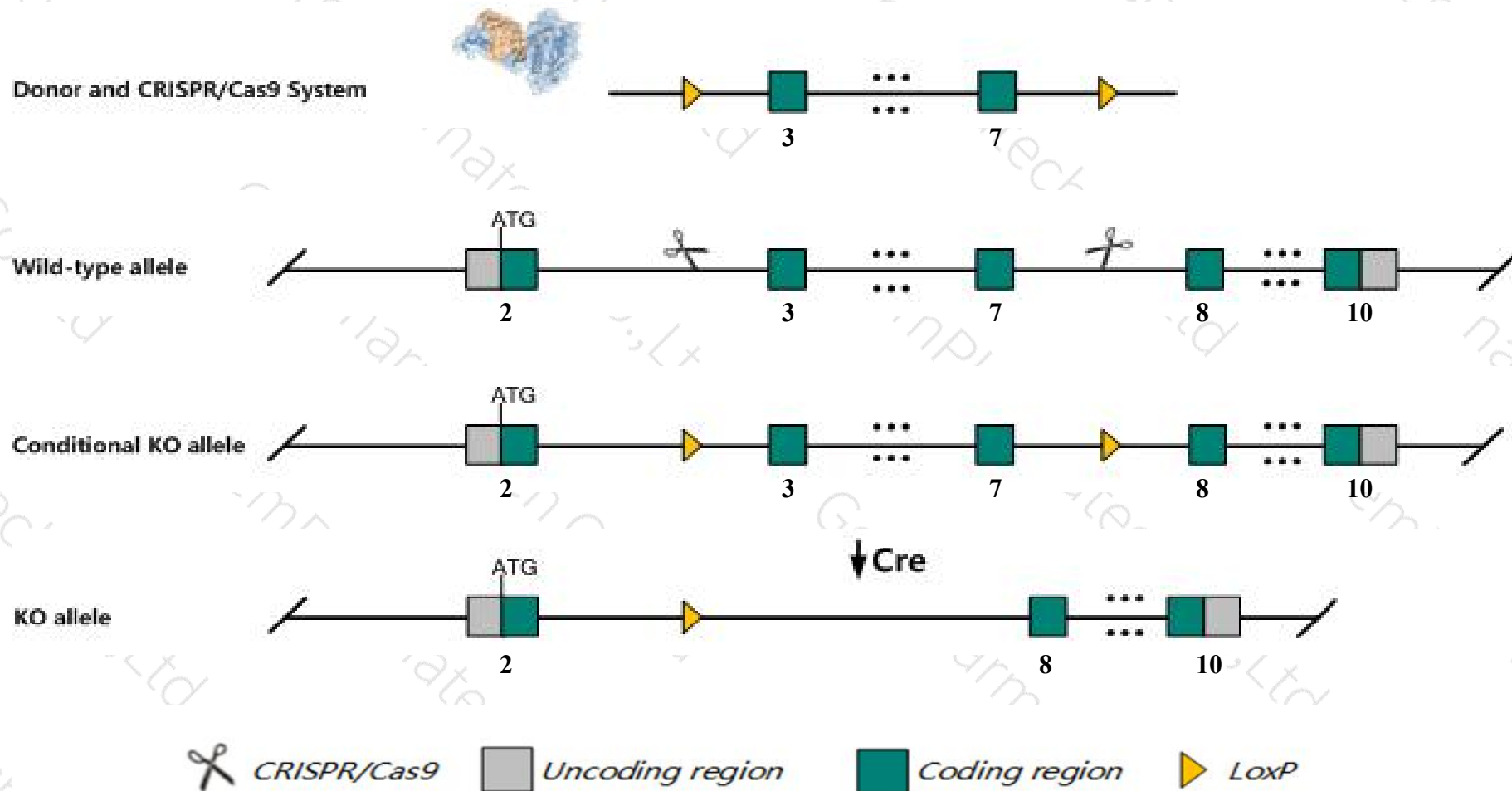
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Bdh2* gene. The schematic diagram is as follows:



- The *Bdh2* gene has 4 transcripts. According to the structure of *Bdh2* gene, exon3-exon7 of *Bdh2*-202 (ENSMUST00000120397.7) transcript is recommended as the knockout region. The region contains 460bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Bdh2* 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

- Transcript *Bdh2*-204 may not be affected.
- The *Bdh2* 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)



Bdh2 3-hydroxybutyrate dehydrogenase, type 2 [*Mus musculus* (house mouse)]

Gene ID: 69772, updated on 27-Feb-2020

Summary

- Official Symbol** Bdh2 provided by [MGI](#)
- Official Full Name** 3-hydroxybutyrate dehydrogenase, type 2 provided by [MGI](#)
- Primary source** [MGI:MGI:1917022](#)
- See related** [Ensembl:ENSMUSG00000028167](#)
- 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** Dhhs6; 1810026B04Rik
- Expression** Biased expression in kidney adult (RPKM 79.3), liver adult (RPKM 4.6) and 1 other tissue [See more](#)
- Orthologs** [human](#) [all](#)

Genomic context

Location: 3; 3 G3 See Bdh2 in [Genome Data Viewer](#)

Exon count: 10

Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	3	NC_000069.6 (135281221..135304426)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	3	NC_000069.5 (134944185..134967390)

Transcript information (Ensembl)

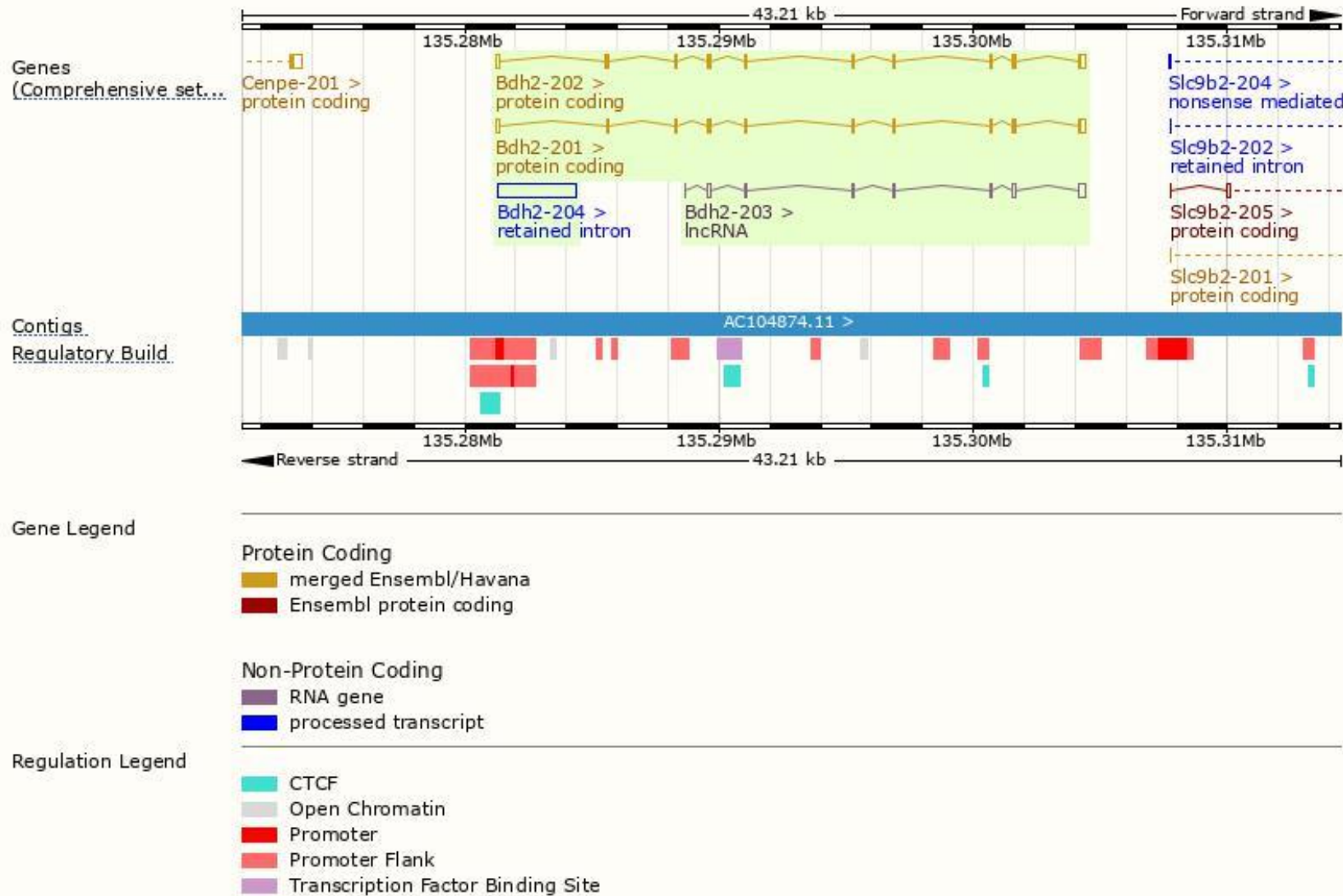
The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Bdh2-202	ENSMUST00000120397.7	1172	255aa	Protein coding	CCDS51073	G3UWD3	TSL:5 GENCODE basic
Bdh2-201	ENSMUST00000029817.10	1059	245aa	Protein coding	CCDS17853	Q8JZV9	TSL:1 GENCODE basic APPRIS P1
Bdh2-204	ENSMUST00000198491.1	3134	No protein	Retained intron	-	-	TSL:NA
Bdh2-203	ENSMUST00000154869.3	819	No protein	lncRNA	-	-	TSL:1

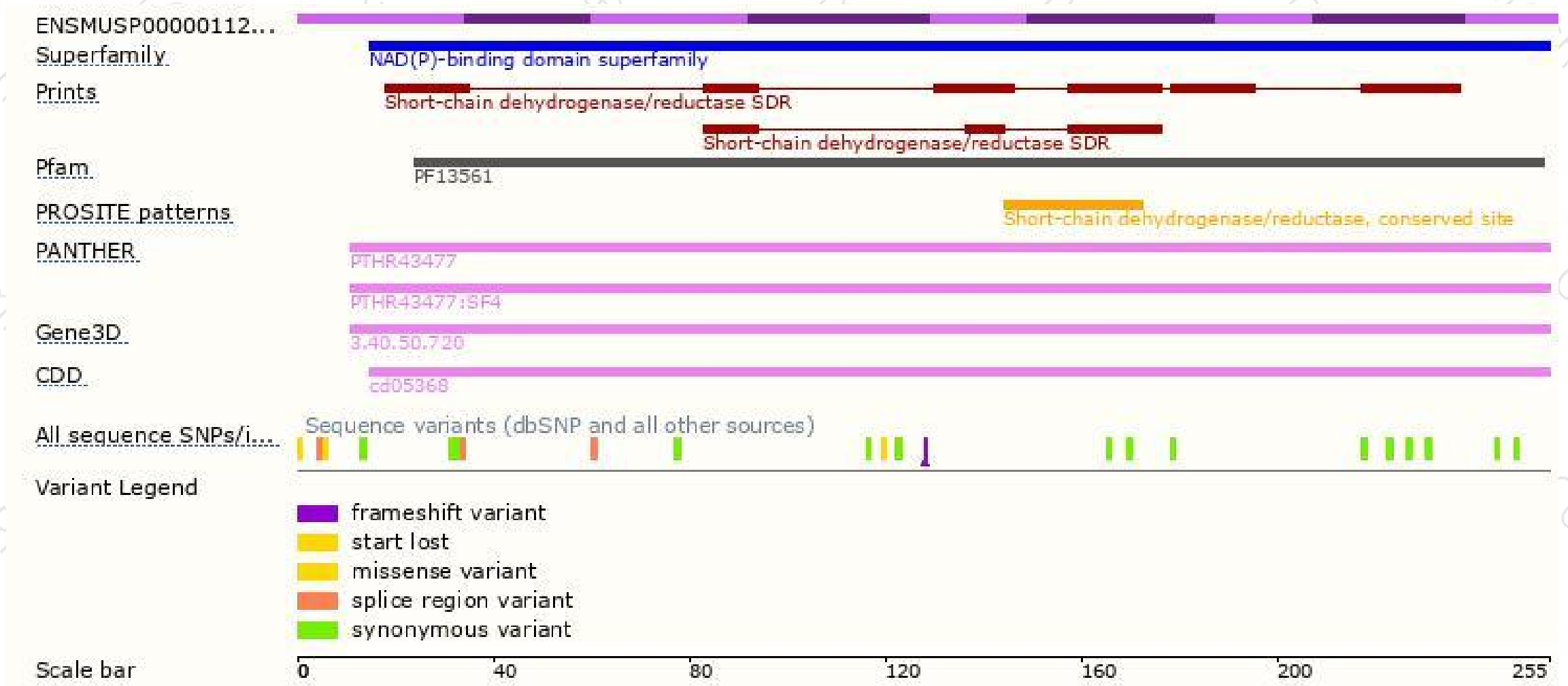
The strategy is based on the design of *Bdh2-202* transcript,The transcription is shown below



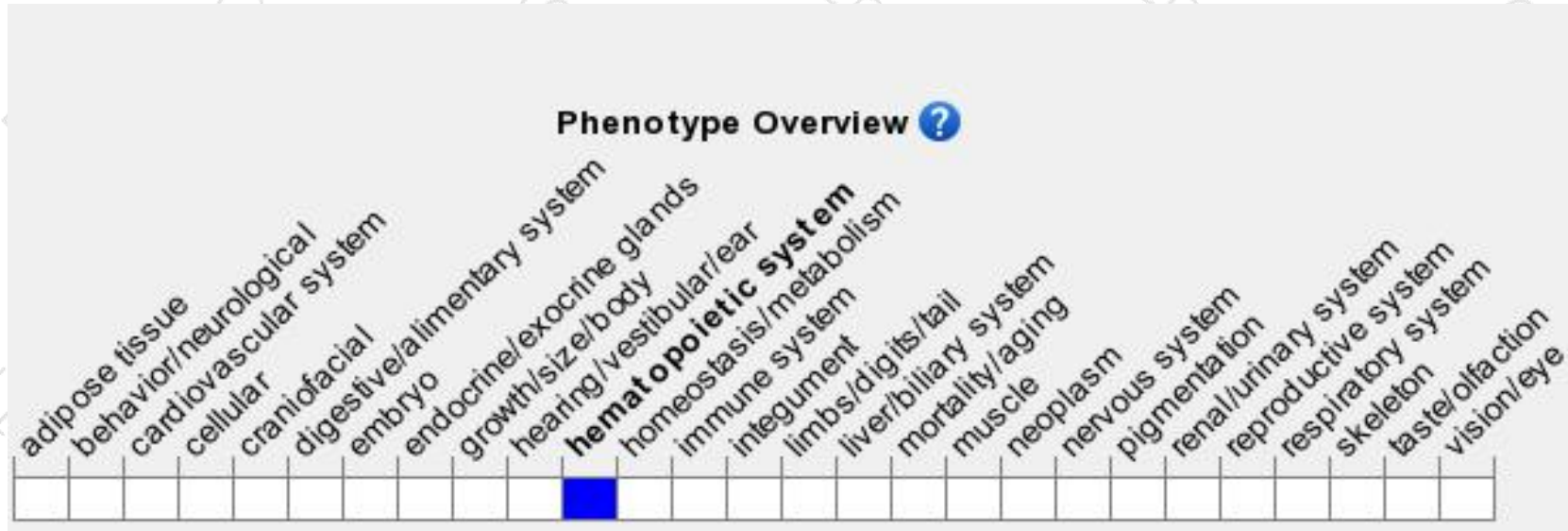
Genomic location distribution



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/>).

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

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