Sdhd Cas9-CKO Strategy

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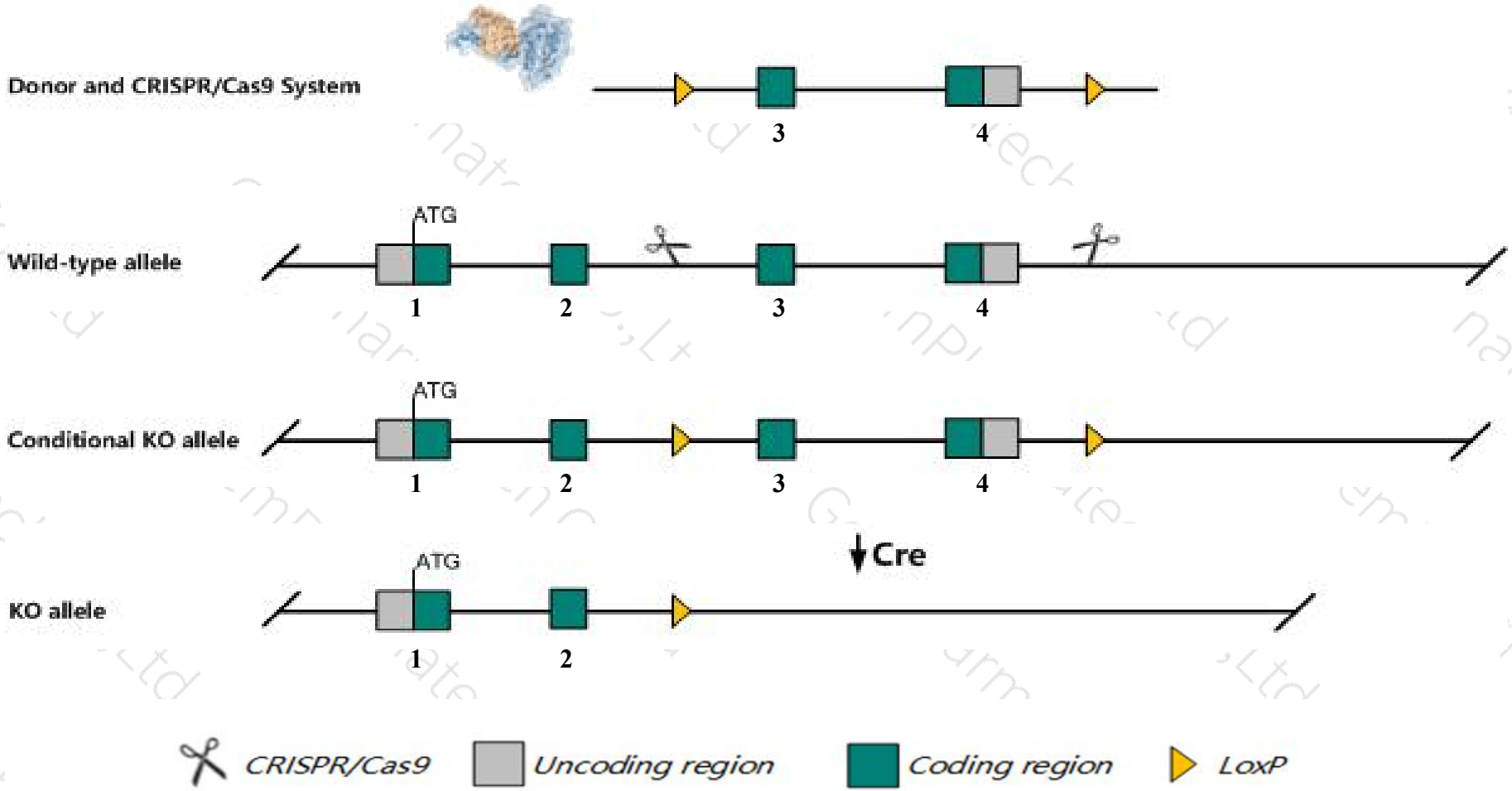
Project Overview

Project Name	***Sdhd***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

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



Technical routes

- The *Sdhd* gene has 1 transcript. According to the structure of *Sdhd* gene, exon3-exon4 of *Sdhd-201* (ENSMUST00000000175.5) transcript is recommended as the knockout region.The region contains translation stop codon. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Sdhd* gene. The brief process is as follows:gRNA was transcribed in vitro, donor was constructed.Cas9, gRNA 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

- According to the existing MGI data,Homozygous null mice die before E7.5. Heterozygotes show a deficiency in succinate dehydrogenase activity and an abnormal enhancement of resting carotid body activity due to a decrease of potassium conductance and persistent calcium influx into glomus cells.

- The *Sdhd* gene is located on the Chr9. 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）

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Sdhd succinate dehydrogenase complex, subunit D, integral membrane protein [*Mus musculus* (house mouse)]

Gene ID: 66925, updated on 12-Aug-2019

Summary

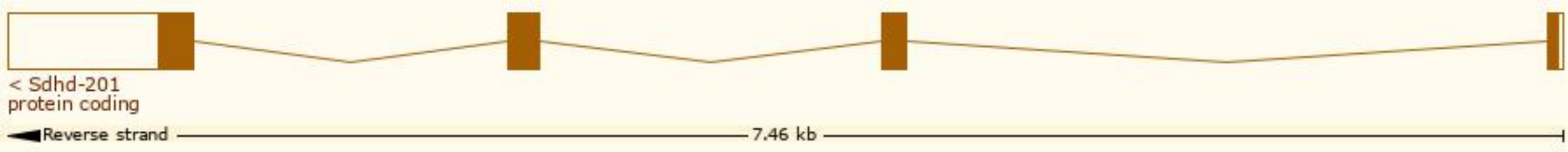
Official Symbol	Sdhd provided by MGI
Official Full Name	succinate dehydrogenase complex, subunit D, integral membrane protein provided by MGI
Primary source	MGI:MGI:1914175
See related	Ensembl:ENSMUSG00000000171
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	C78570; AVLL5809; PRO19626; 3110001M13Rik
Expression	Ubiquitous expression in heart adult (RPKM 247.8), duodenum adult (RPKM 208.9) and 28 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

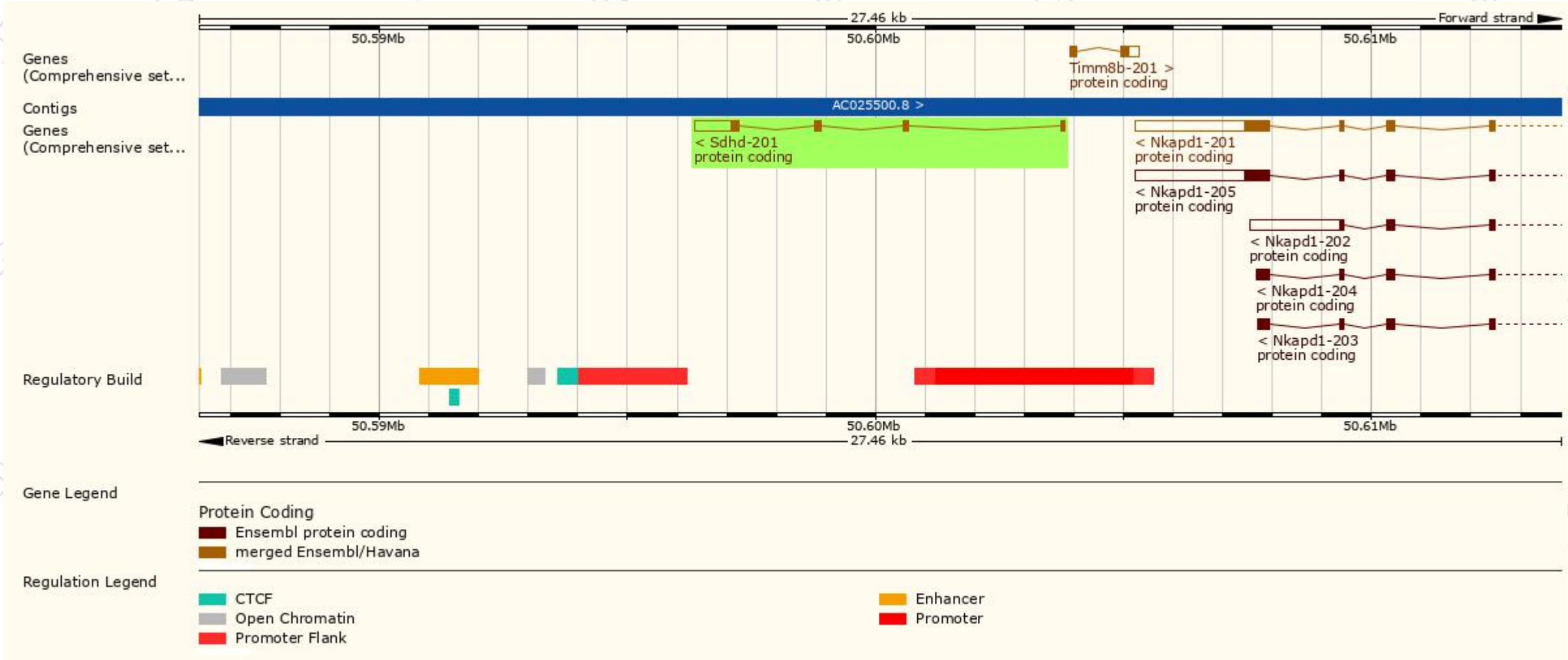
The gene has 1 transcript,and the transcript is shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Sdhd-201	ENSMUST00000000175.5	1231	159aa	Protein coding	CCDS40623	Q9CXV1	TSL:1 GENCODE basic APPRIS P1

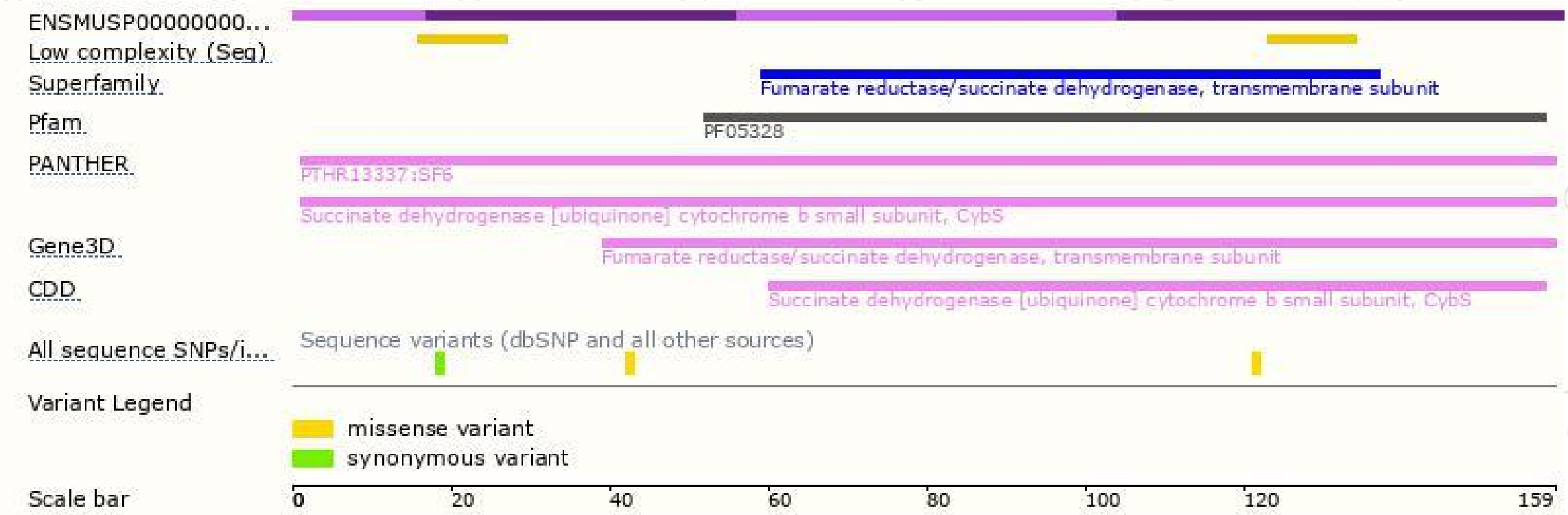
The strategy is based on the design of *Sdhd-201* transcript, the transcription is shown below:



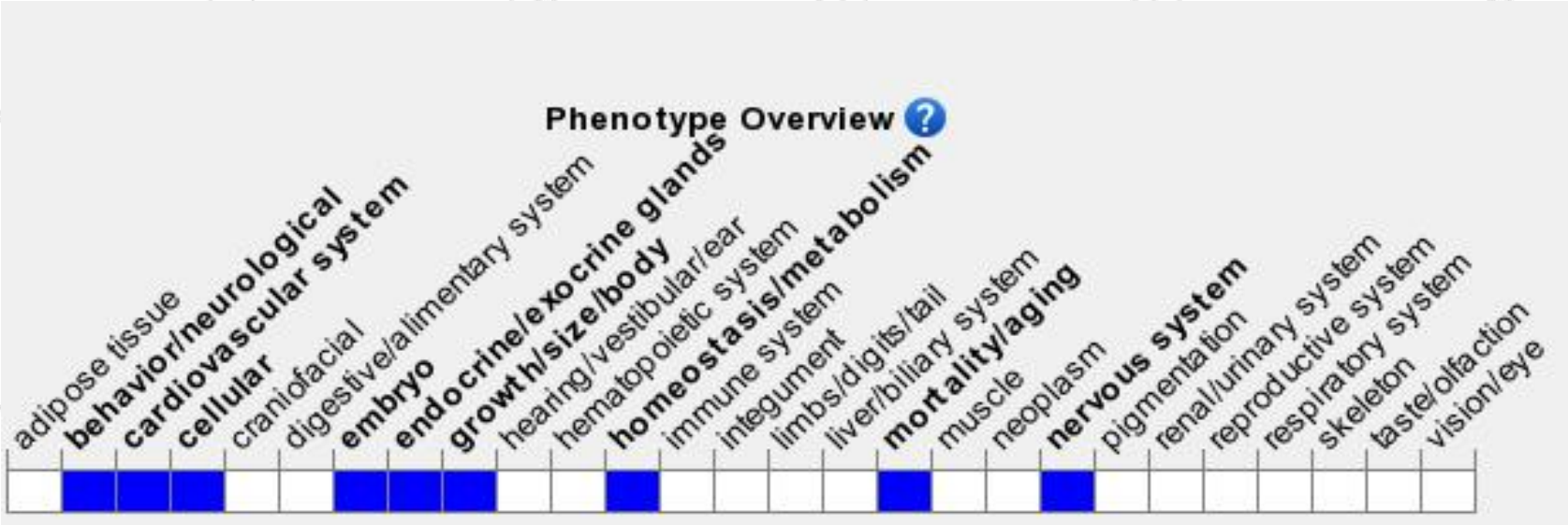
Genomic location distribution



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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