Dhtkd1 Cas9-CKO Strategy

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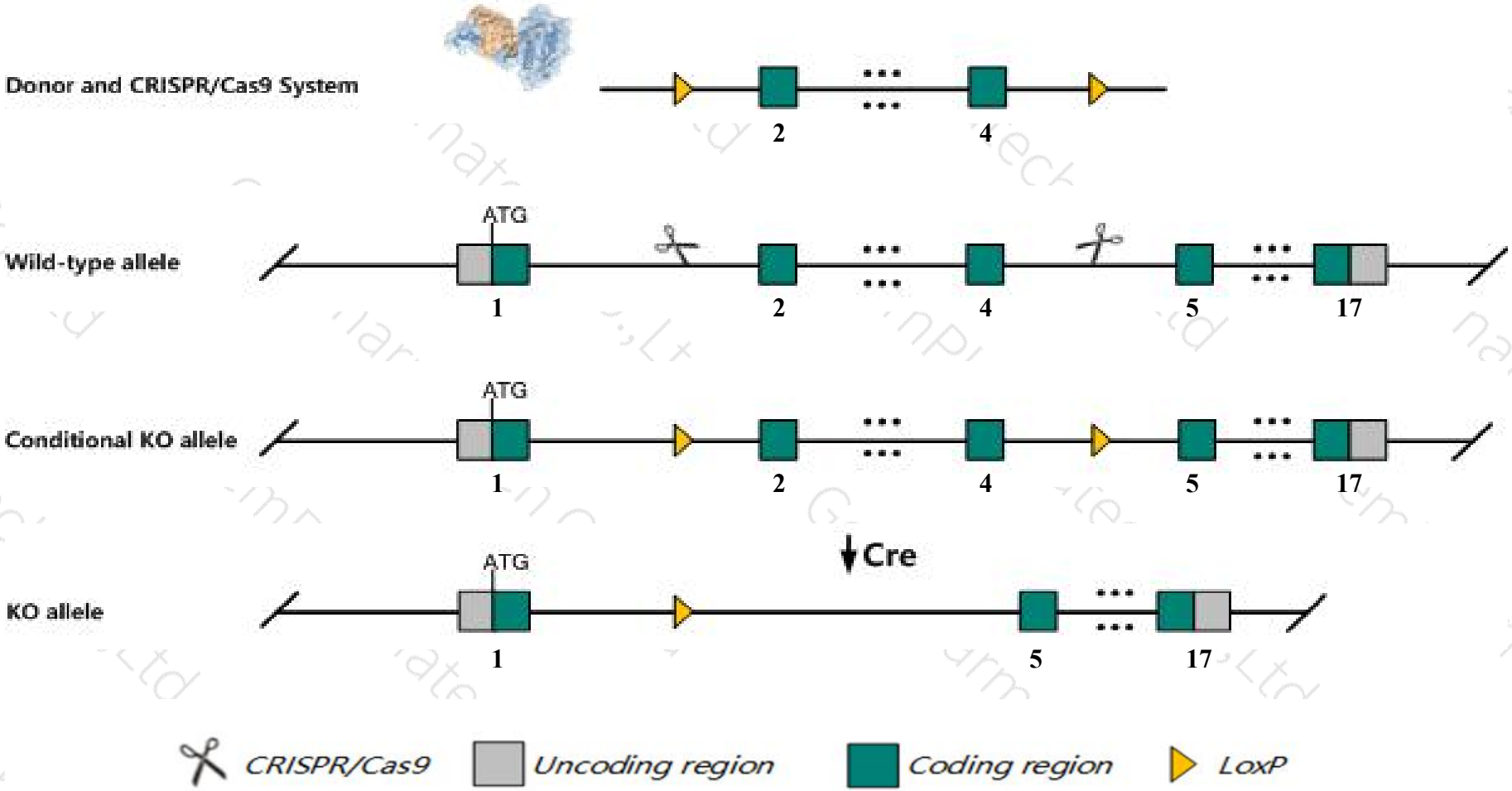
Project Overview

Project Name	***Dhtkd1***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Dhtkd1* gene. The schematic diagram is as follows:



Technical routes

- The *Dhtkd1* gene has 5 transcripts. According to the structure of *Dhtkd1* gene, exon2-exon4 of *Dhtkd1-202* (ENSMUST00000095147.8) transcript is recommended as the knockout region.The region contains 563bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Dhtkd1* 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

- According to the existing MGI data,Null mice show progressive muscle weakness and atrophy, motor and sensory dysfunctions, decreased nerve conduction velocity, increased 2-ketoadipic acid and 2-aminoadipic acid in urine, elevated insulin levels, myelin damage and axonal degeneration.

- The *Dhtkd1* gene is located on the Chr2. 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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Dhtkd1 dehydrogenase E1 and transketolase domain containing 1 [Mus musculus (house mouse)]

Gene ID: 209692, updated on 31-Jan-2019

Summary

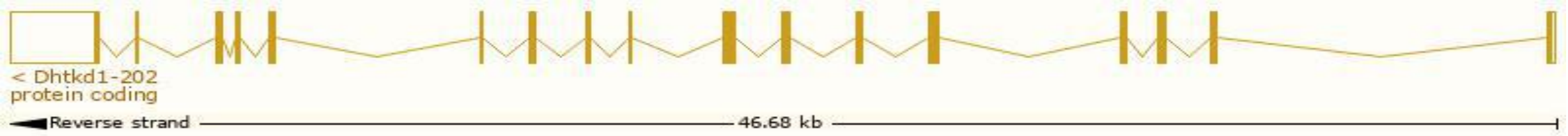
Official Symbol	Dhtkd1 provided by MGI
Official Full Name	dehydrogenase E1 and transketolase domain containing 1 provided by MGI
Primary source	MGI:MGI:2445096
See related	Ensembl:ENSMUSG00000025815
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	C330018I04Rik
Expression	Broad expression in liver adult (RPKM 7.6), kidney adult (RPKM 6.4) and 20 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

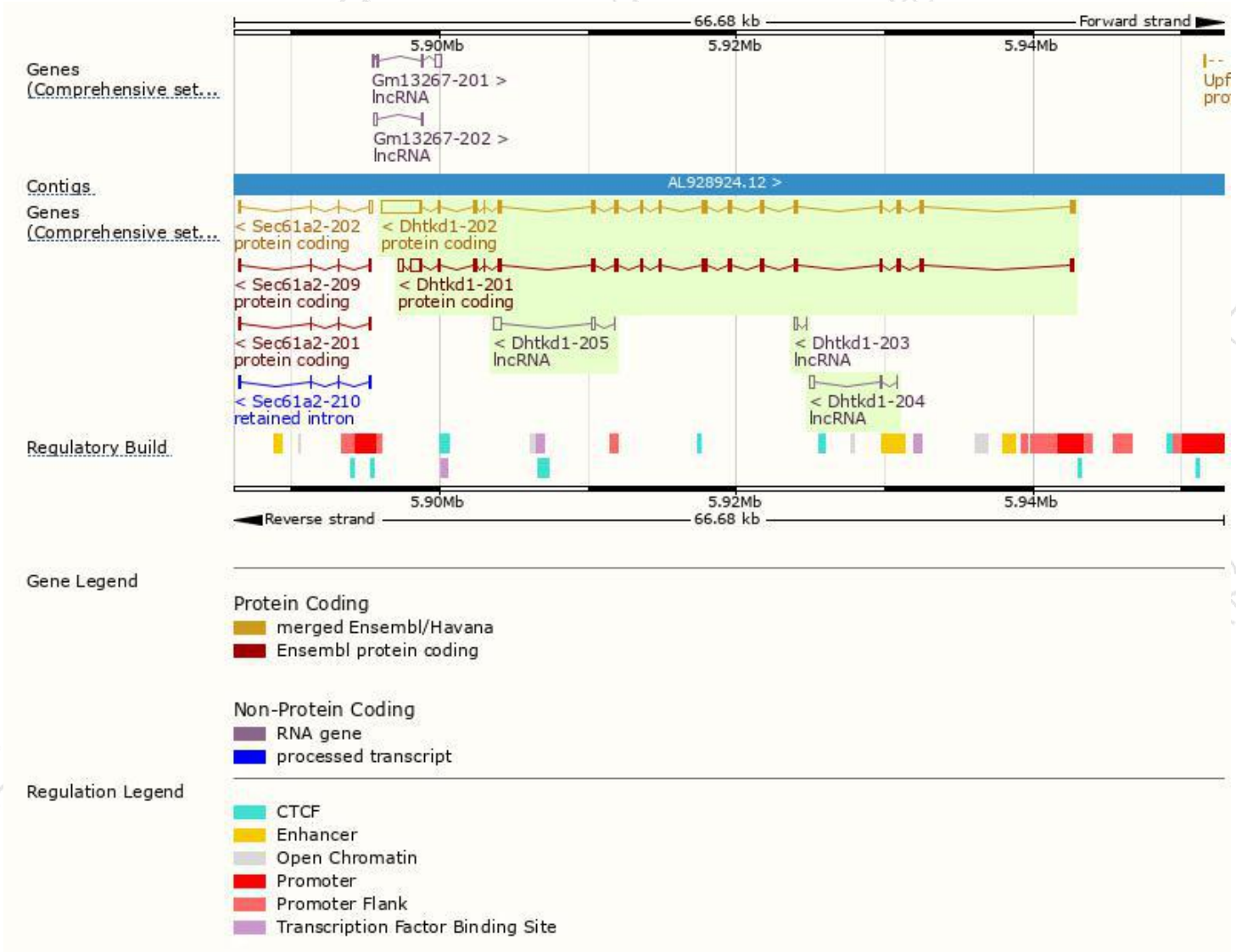
The gene has 5 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Dhtkd1-202	ENSMUST00000095147.8	5480	921aa	Protein coding	CCDS38040	A2ATU0	TSL:5 GENCODE basic APPRIS P1
Dhtkd1-201	ENSMUST00000026924.6	3852	921aa	Protein coding	CCDS38040	A2ATU0	TSL:1 GENCODE basic APPRIS P1
Dhtkd1-204	ENSMUST00000151649.1	663	No protein	lncRNA	-	-	TSL:3
Dhtkd1-205	ENSMUST00000155977.1	663	No protein	lncRNA	-	-	TSL:5
Dhtkd1-203	ENSMUST00000127609.1	363	No protein	lncRNA	-	-	TSL:3

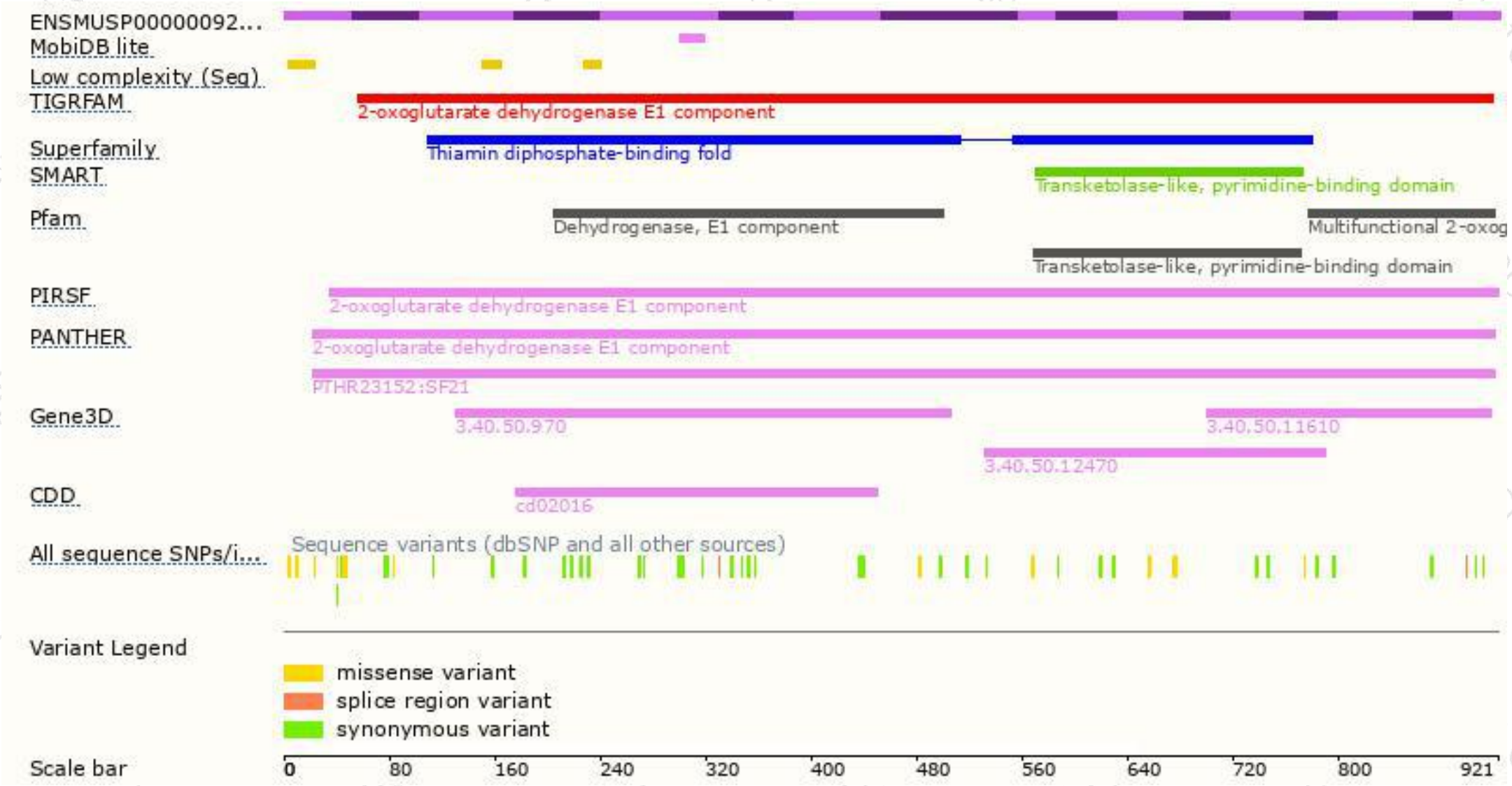
The strategy is based on the design of *Dhtkd1-202* transcript,The transcription is shown below



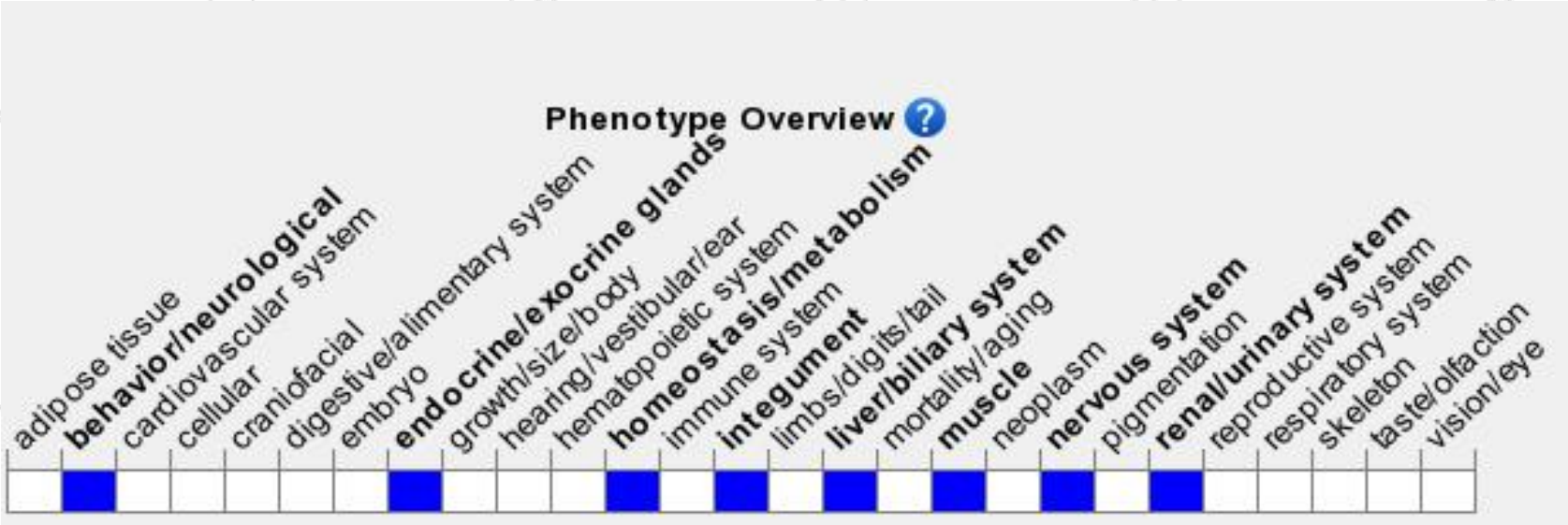
Genomic location distribution



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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