

Aldh2 Cas9-CKO Strategy

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Project Overview

Project Name

Aldh2

Project type

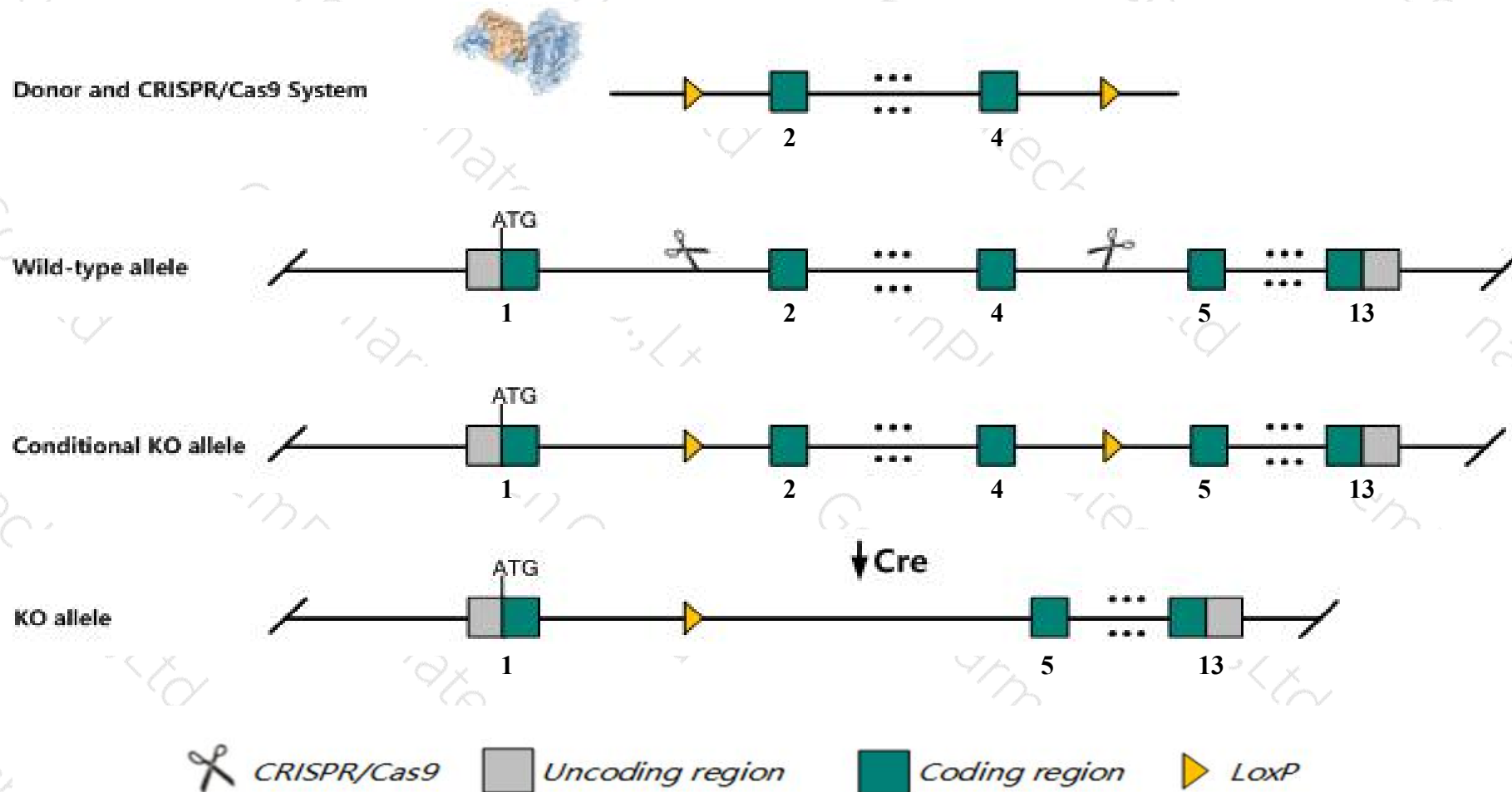
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Aldh2* gene. The schematic diagram is as follows:



- The *Aldh2* gene has 7 transcripts. According to the structure of *Aldh2* gene, exon2-exon4 of *Aldh2-201* (ENSMUST00000031411.14) transcript is recommended as the knockout region. The region contains 326bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Aldh2* 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.

- According to the existing MGI data, Homozygous mutation of this gene results in the absence of oxidation activity in the mitochondria. Mice homozygous for a different allele exhibit decreased litter size.
- Transcript *Aldh2*-203,205,207 may not be affected.
- The *Aldh2* gene is located on the Chr5. 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)

Aldh2 aldehyde dehydrogenase 2, mitochondrial [Mus musculus (house mouse)]

Gene ID: 11669, updated on 2-Apr-2019

Summary



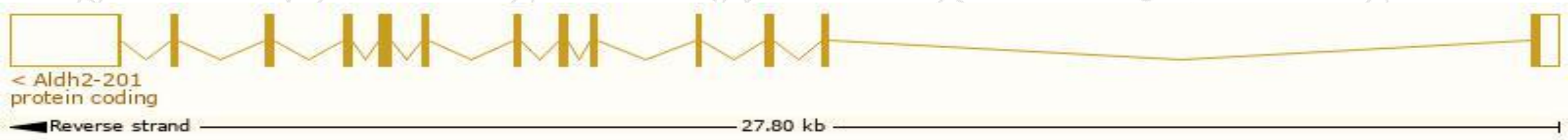
Official Symbol	Aldh2 provided by MGI
Official Full Name	aldehyde dehydrogenase 2, mitochondrial provided by MGI
Primary source	MGI:MGI:99600
See related	Ensembl:ENSMUSG00000029455
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	AHD-M1, ALDH-E2, ALDHI, Ahd-5, Ahd5
Expression	Broad expression in adrenal adult (RPKM 574.9), liver adult (RPKM 432.0) and 18 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

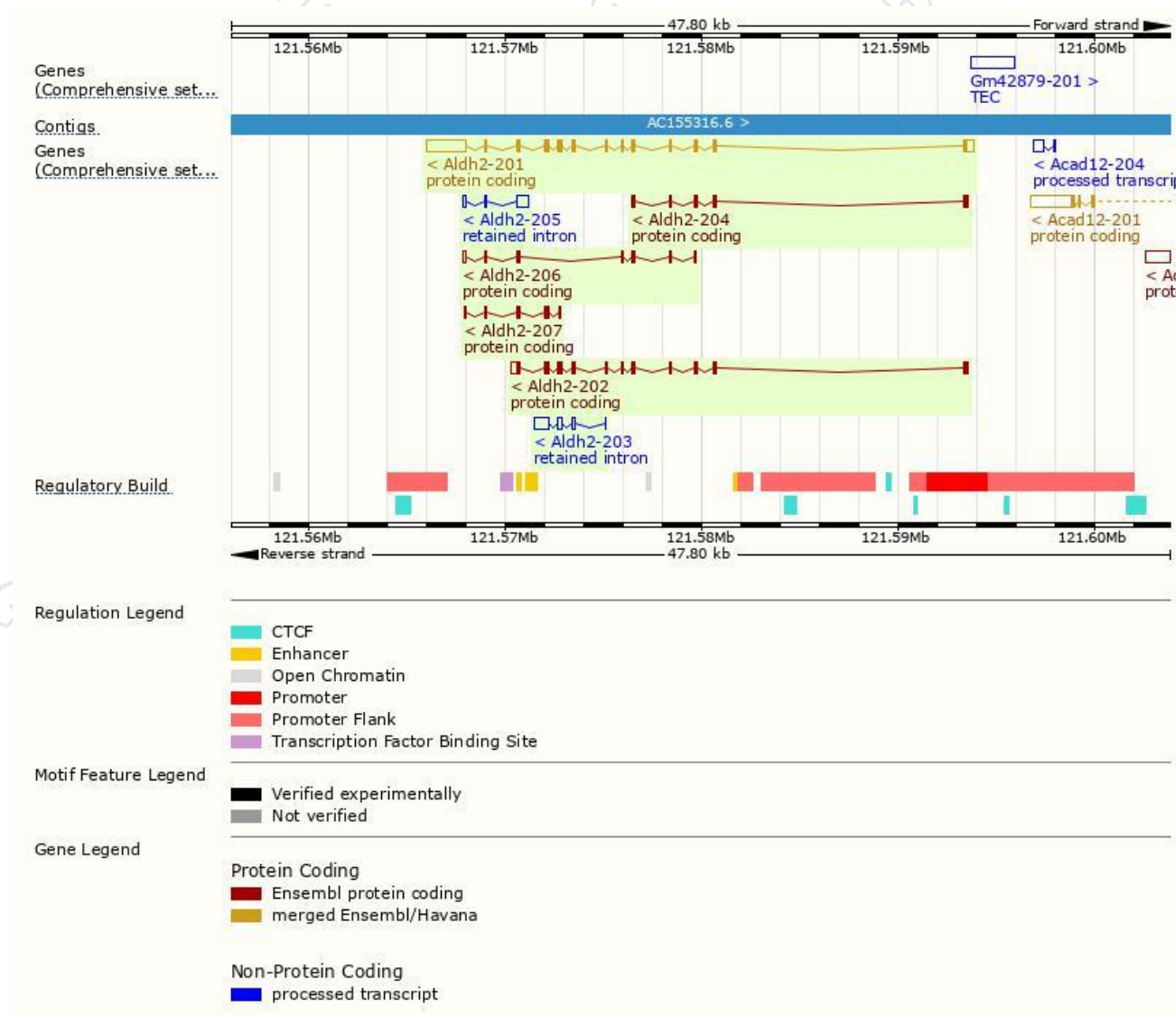
The gene has 7 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Aldh2-201	ENSMUST00000031411.14	3867	519aa	Protein coding	CCDS19638	P47738 Q544B1	TSL:1 GENCODE basic APPRIS P1
Aldh2-202	ENSMUST00000129753.7	1799	471aa	Protein coding	CCDS84951	A0A0G2JEU1	TSL:1 GENCODE basic
Aldh2-206	ENSMUST00000199369.4	802	229aa	Protein coding	-	A0A0G2JFQ0	CDS 5' incomplete TSL:5
Aldh2-204	ENSMUST00000152945.2	656	185aa	Protein coding	-	D3YYF3	CDS 3' incomplete TSL:3
Aldh2-207	ENSMUST00000200541.4	623	196aa	Protein coding	-	A0A0G2JF60	CDS 5' incomplete TSL:3
Aldh2-203	ENSMUST00000133033.1	1035	No protein	Retained intron	-	-	TSL:1
Aldh2-205	ENSMUST00000196694.1	845	No protein	Retained intron	-	-	TSL:1

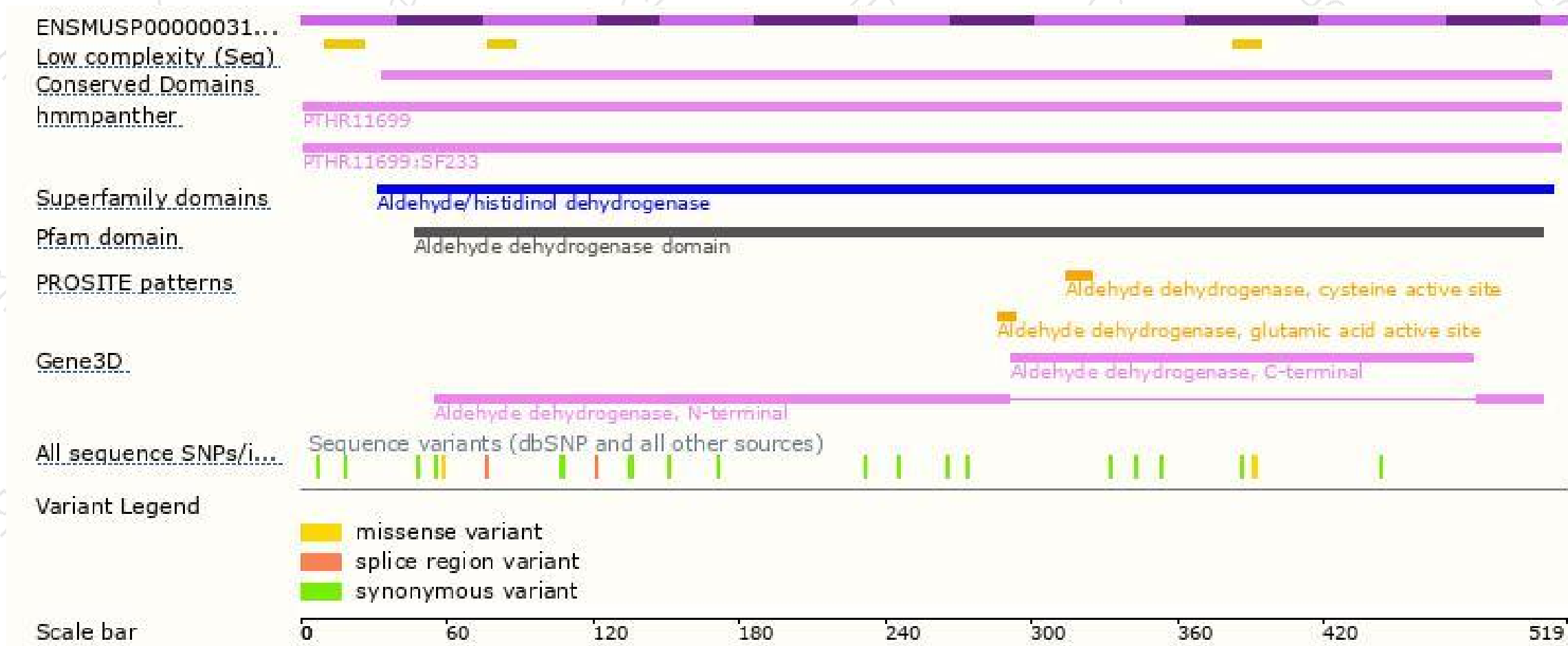
The strategy is based on the design of *Aldh2-201* transcript,The transcription is shown below



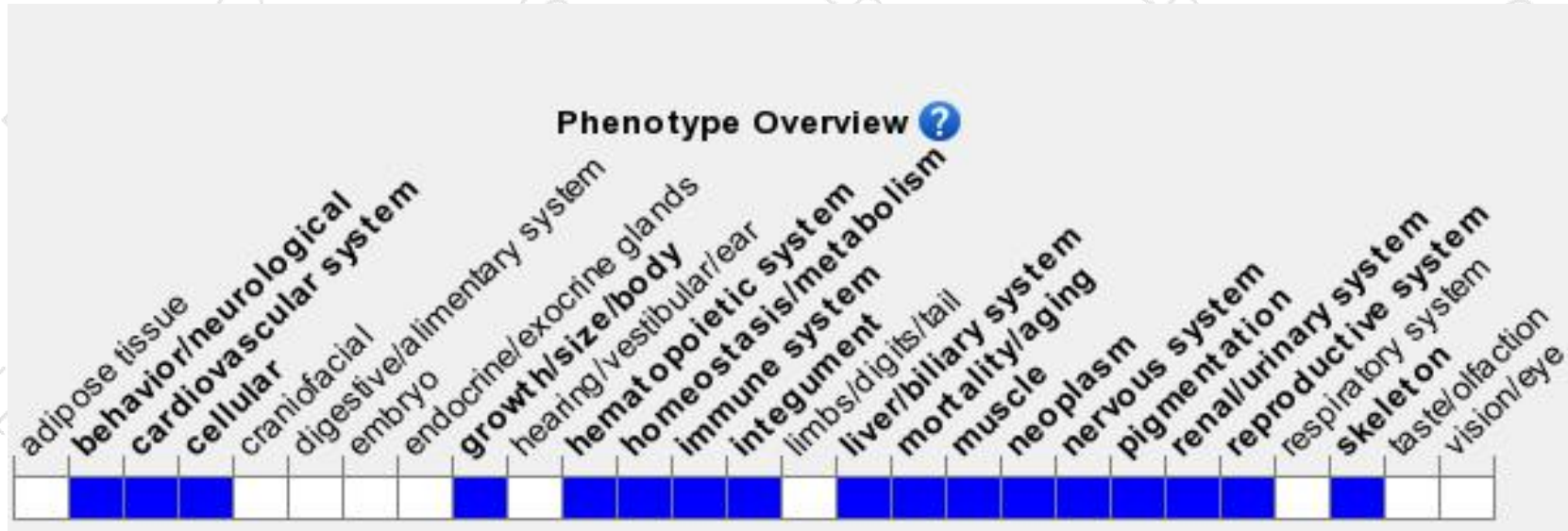
Genomic location distribution



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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