

Aldh1a3 Cas9-CKO Strategy

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Project Overview

Project Name

Aldh1a3

Project type

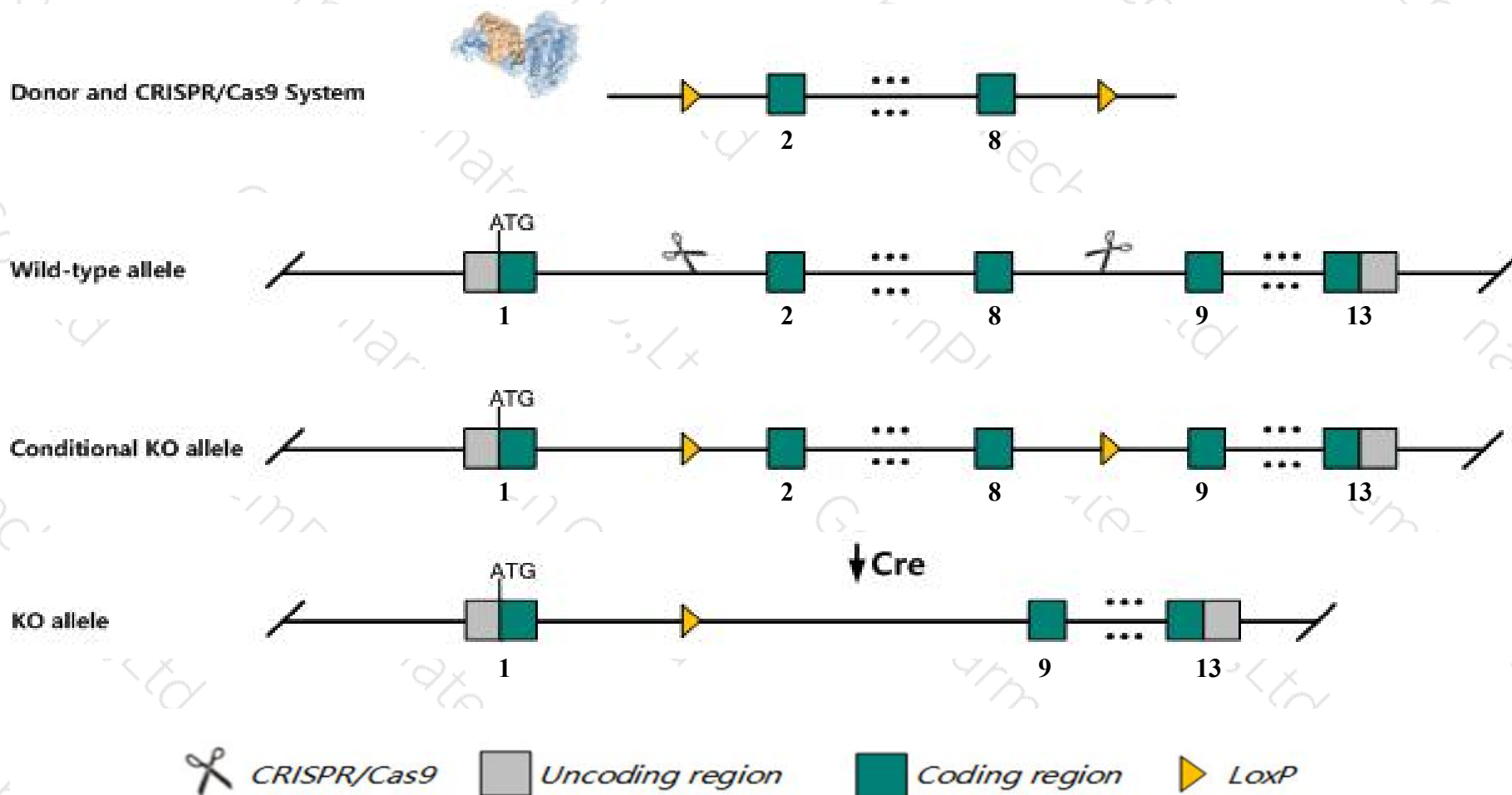
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Aldh1a3* gene. The schematic diagram is as follows:



Technical routes

- The *Aldh1a3* gene has 5 transcripts. According to the structure of *Aldh1a3* gene, exon2-exon8 of *Aldh1a3-201* (ENSMUST00000015278.14) transcript is recommended as the knockout region. The region contains 784bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Aldh1a3* 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, Nullizygous mice show neonatal death and persistent hyperplastic primary vitreous. Homozygotes for a null allele have choanal atresia, ethmoturbinal hypoplasia, ventral lens rotation, short ventral retina and no Harderian gland. Homozygotes for another allele show thick neural retina and no vitreum.
- The *Aldh1a3* 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at existing technological level.

Gene information (NCBI)

Aldh1a3 aldehyde dehydrogenase family 1, subfamily A3 [*Mus musculus* (house mouse)]

Gene ID: 56847, updated on 17-Dec-2019

Summary

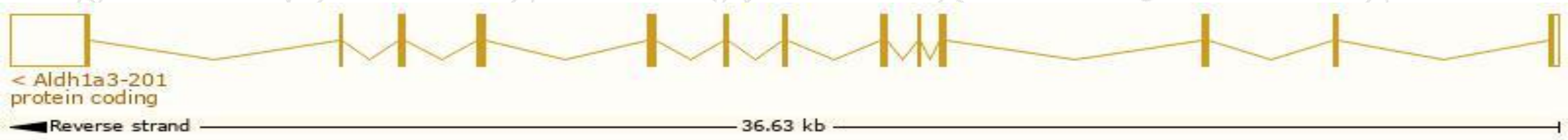
Official Symbol	Aldh1a3 provided by MGI
Official Full Name	aldehyde dehydrogenase family 1, subfamily A3 provided by MGI
Primary source	MGI:MGI:1861722
See related	Ensembl:ENSMUSG00000015134
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	V1; ALDH6; RALDH3
Expression	Broad expression in placenta adult (RPKM 9.8), bladder adult (RPKM 6.2) and 17 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

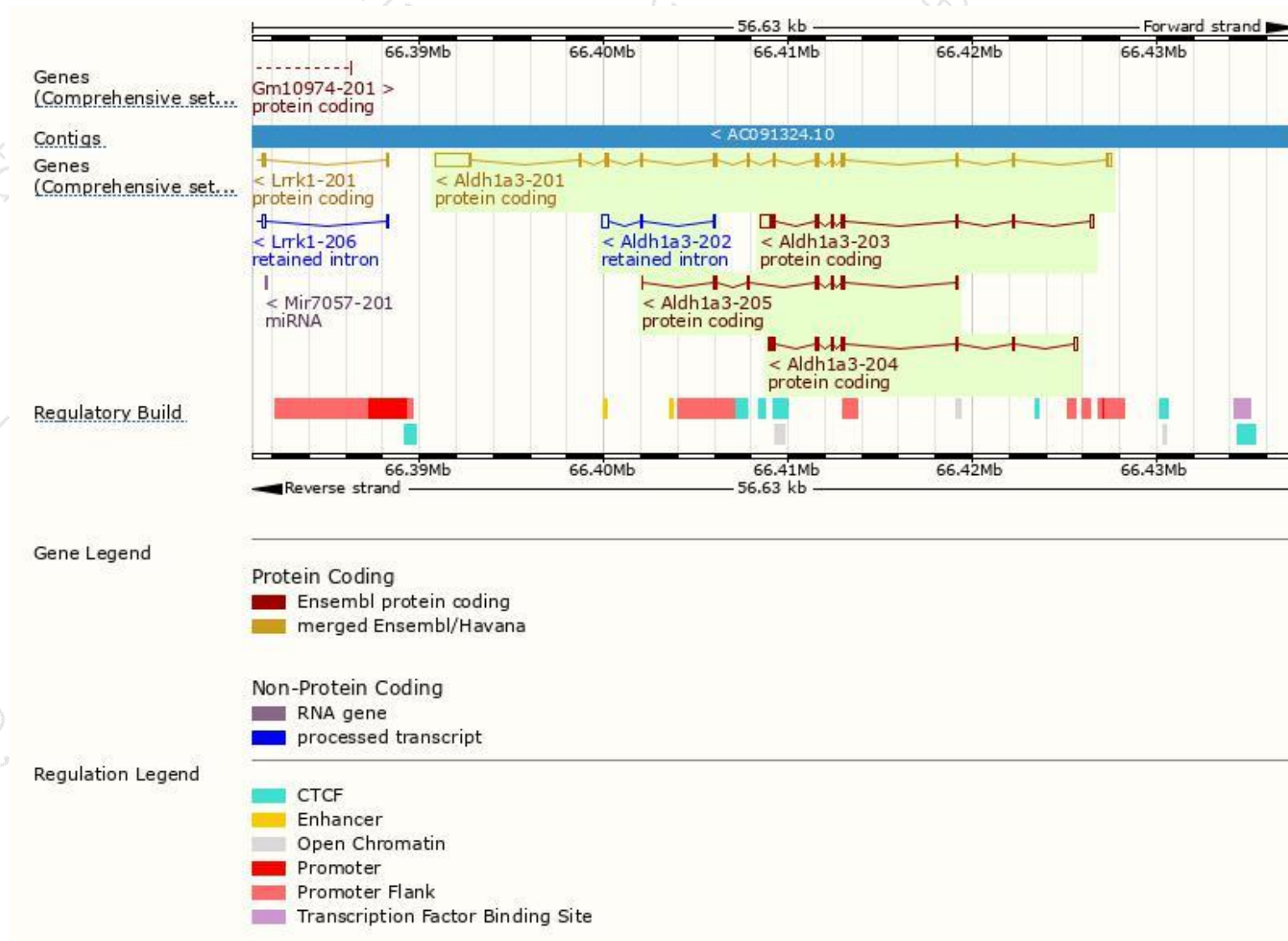
The gene has 5 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Aldh1a3-201	ENSMUST00000015278.14	3443	512aa	Protein coding	CCDS21345	Q3UIA4 Q9JHW9	TSL:1 GENCODE basic APPRIS P1
Aldh1a3-203	ENSMUST000000174209.7	1496	176aa	Protein coding	-	A0A140LIF9	TSL:1 GENCODE basic
Aldh1a3-204	ENSMUST000000174215.1	1066	176aa	Protein coding	-	A0A140LIF9	TSL:1 GENCODE basic
Aldh1a3-205	ENSMUST000000174701.1	829	277aa	Protein coding	-	G3UWP3	5' and 3' truncations in transcript evidence prevent annotation of the start and the end of the CDS. CDS 5' and 3' incomplete TSL:5
Aldh1a3-202	ENSMUST000000173756.1	535	No protein	Retained intron	-	-	TSL:5

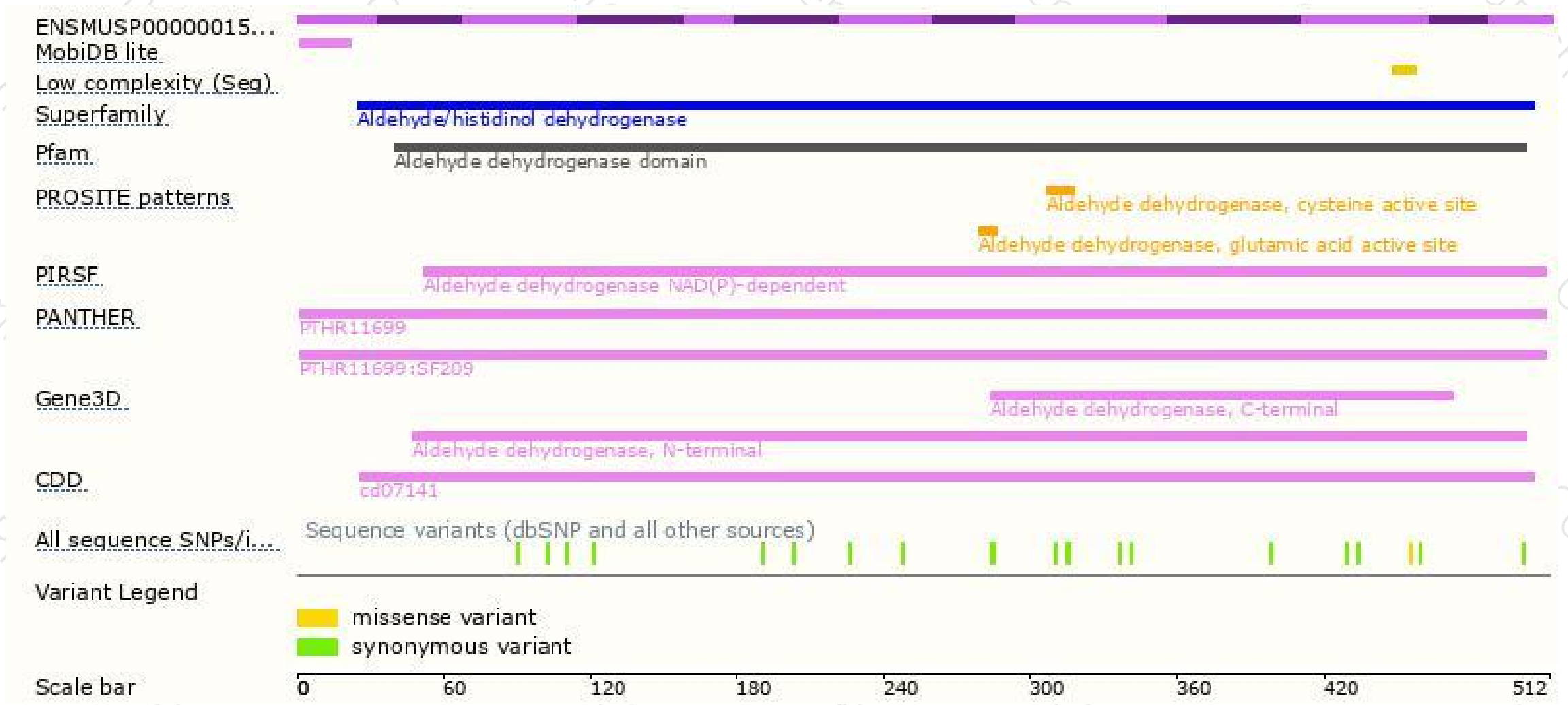
The strategy is based on the design of *Aldh1a3-201* transcript,The transcription is shown below



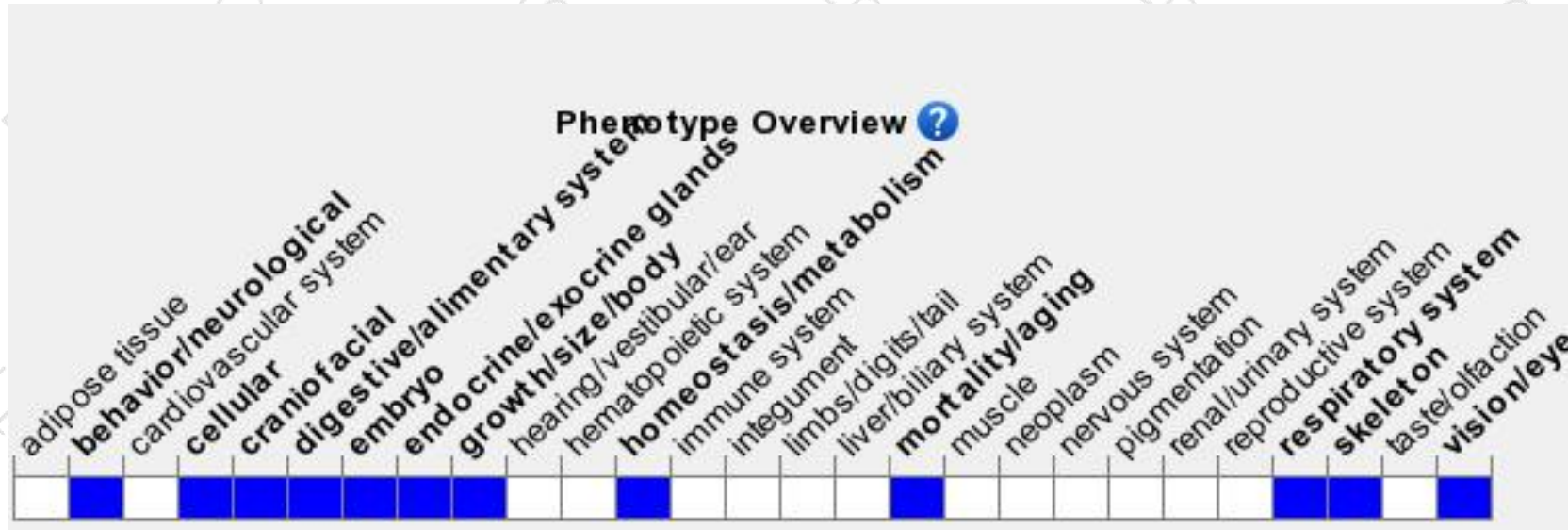
Genomic location distribution



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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