Adh1 Cas9-KO Strategy

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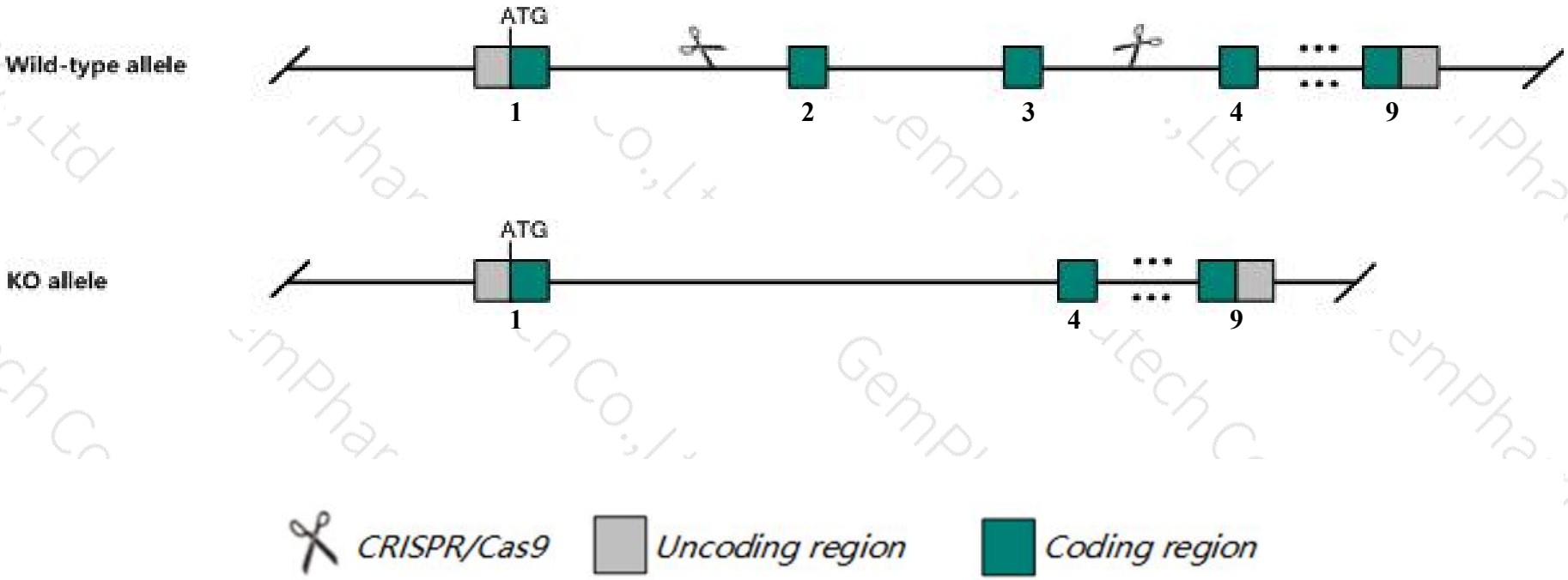
Project Overview

Project Name	***Adh1***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Adh1* gene. The schematic diagram is as follows:



Technical routes

➢ The *Adh1* gene has 4 transcripts. According to the structure of *Adh1* gene, exon2-exon3 of *Adh1-201* (ENSMUST00000004232.9) transcript is recommended as the knockout region.The region contains 241bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Adh1* gene. The brief process is as follows: CRISPR/Cas9 system

Notice

- According to the existing MGI data,Homozygotes for targeted null mutations exhibit impaired metabolism of (and sensitivity to) ethanol and retinol.

- *Gm16559* gene may be destroyed together in this strategy.

- The *Adh1* 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 the gene knockout on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

Gene information （NCBI）

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Adh1 alcohol dehydrogenase 1 (class I) [*Mus musculus* (house mouse)]

Gene ID: 11522, updated on 12-Aug-2019

Summary

Official Symbol	Adh1 provided by MGI
Official Full Name	alcohol dehydrogenase 1 (class I) provided by MGI
Primary source	MGI:MGI:87921
See related	Ensembl:ENSMUSG00000074207
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	Adh-1; ADH-A2; ADH-AA; Adh-1e; Adh-1t; Adh-3e; Adh1-e; Adh1-t; Adh1tl; Adh3-e; Adh-1-t; AI194826
Expression	Biased expression in liver adult (RPKM 1139.9), adrenal adult (RPKM 886.1) and 9 other tissues See more

Genomic context

Location: 3 G3; 3 64.16 cM

See Adh1 in Genome Data Viewer

Exon count: 9

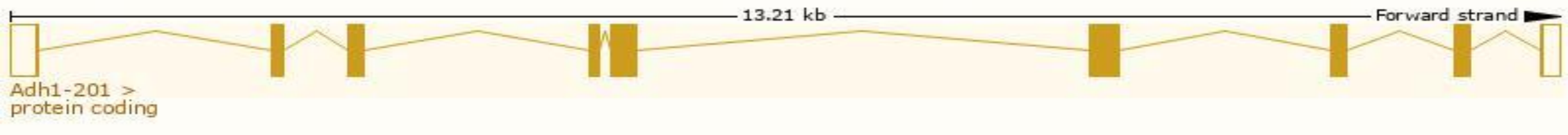
Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	3	NC_000069.6 (138277585..138290698)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	3	NC_000069.5 (137940609..137953655)

Transcript information（Ensembl）

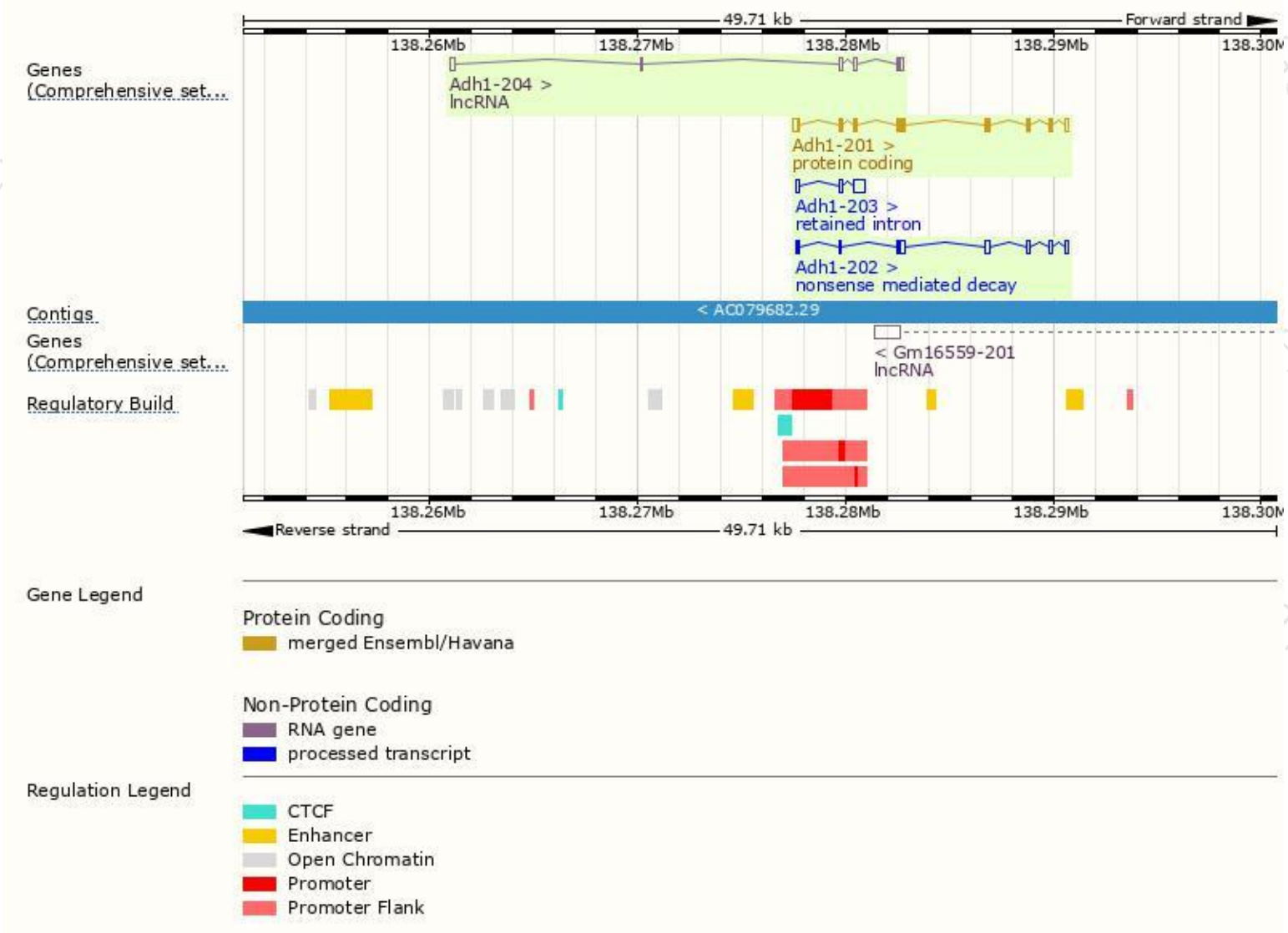
The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Adh1-201	ENSMUST00000004232.9	1492	375aa	Protein coding	CCDS17867	P00329 Q3UKA4	TSL:1 GENCODE basic APPRIS P1
Adh1-202	ENSMUST00000159159.1	1115	44aa	Nonsense mediated decay	-	E0CXV3	TSL:5
Adh1-203	ENSMUST00000161799.1	773	No protein	Retained intron	-	-	TSL:2
Adh1-204	ENSMUST00000162032.7	797	No protein	lncRNA	-	-	TSL:5

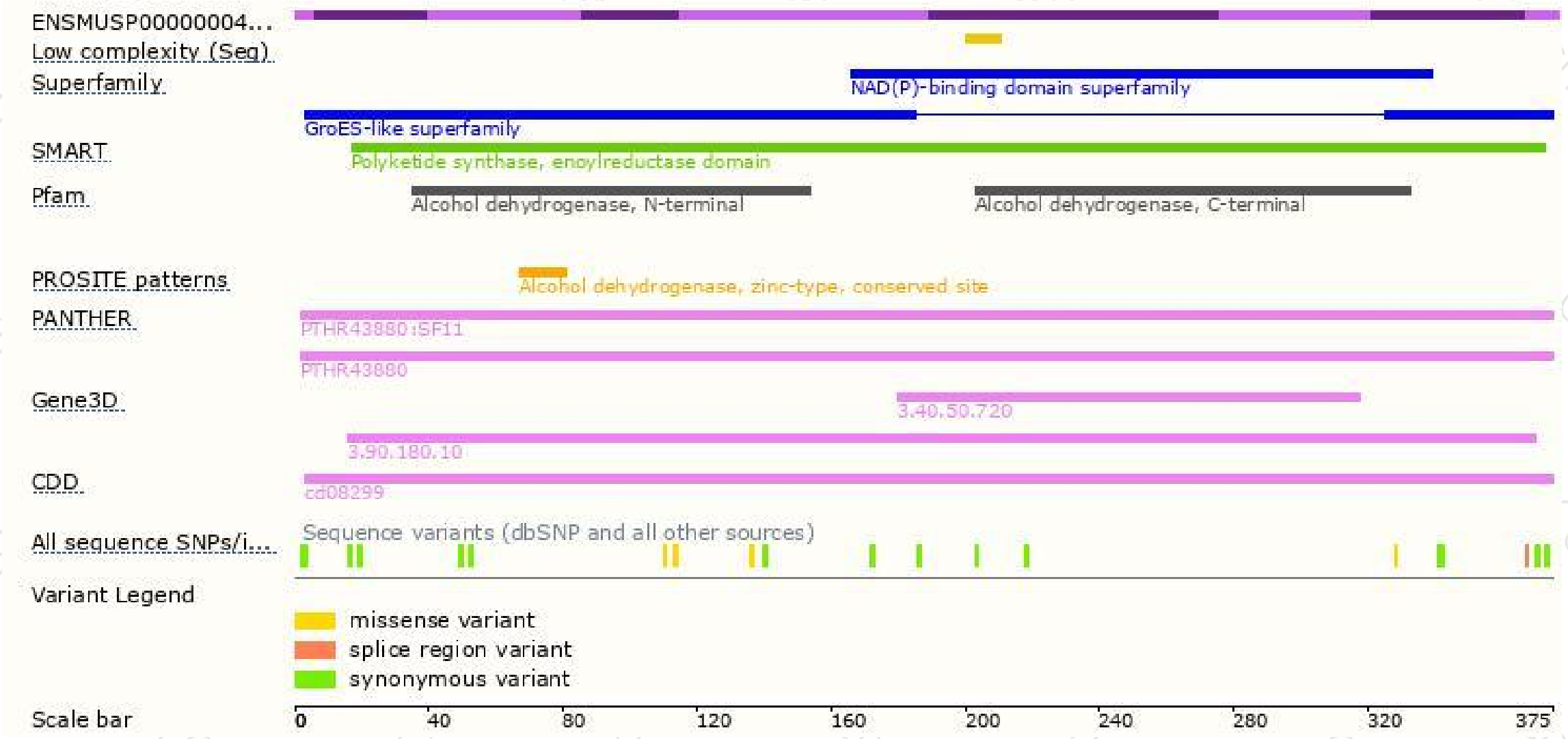
The strategy is based on the design of *Adh1-201* transcript,The transcription is shown below



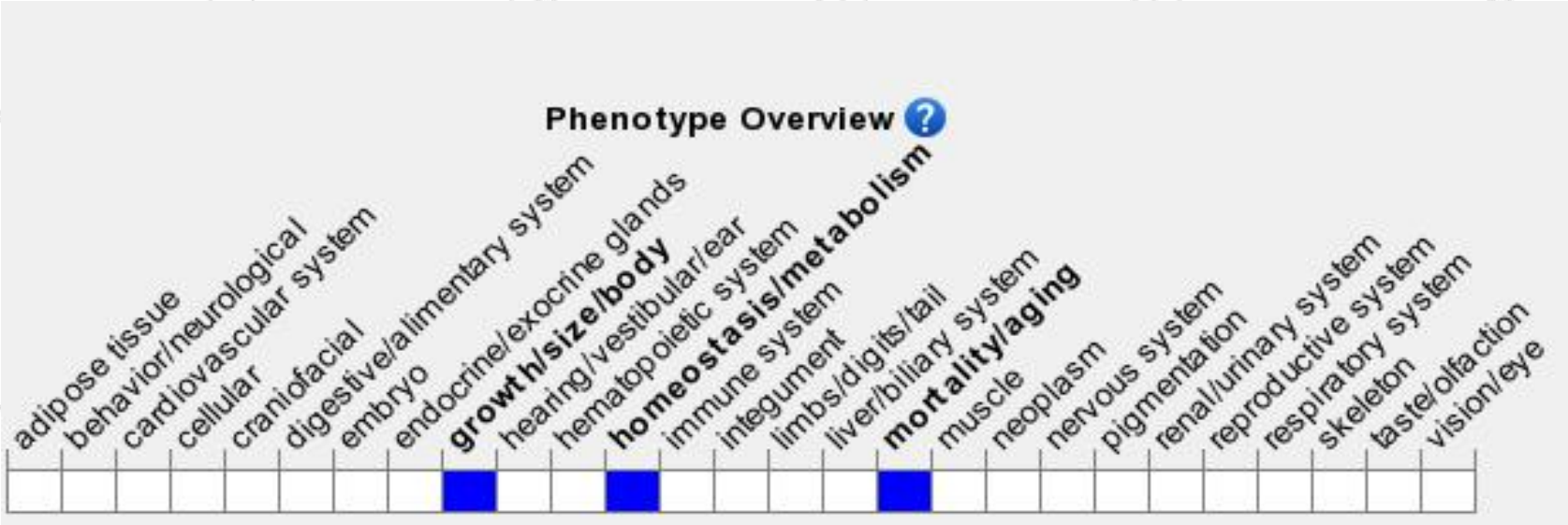
Genomic location distribution



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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