Fa2h Cas9-KO Strategy

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Reviewer: Huan Fan

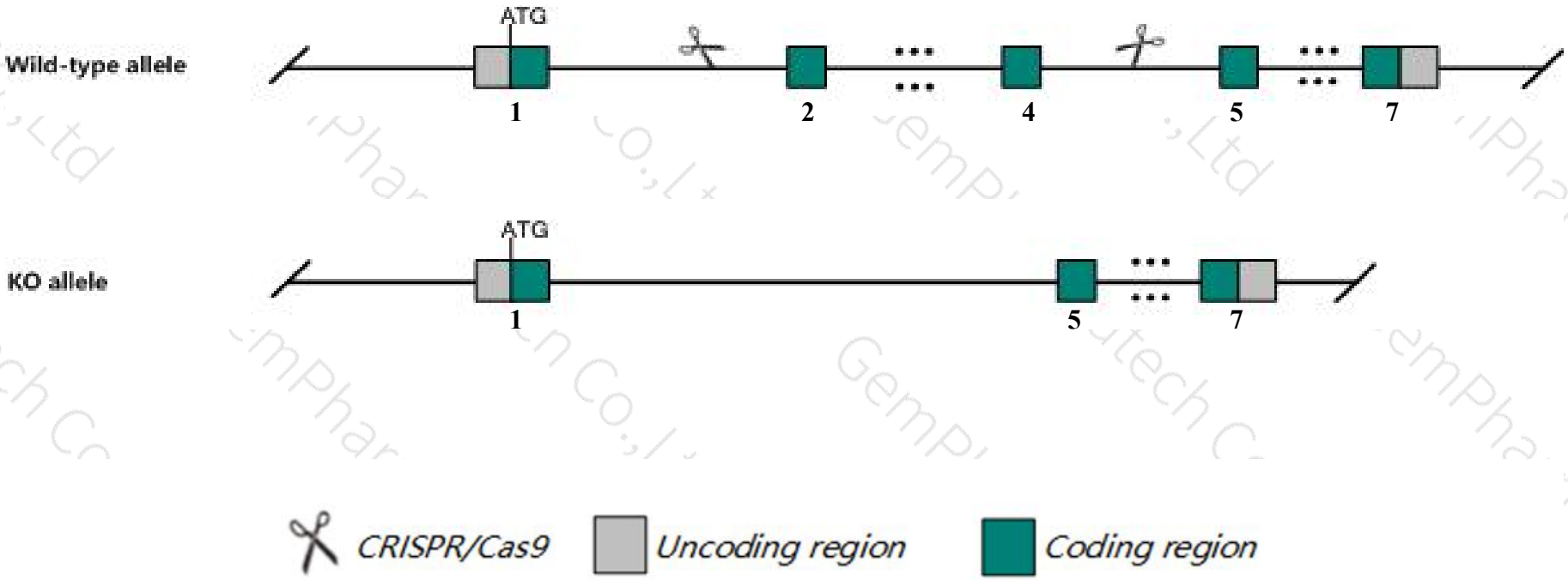
Design Date: 2019-12-17

Project Overview

Project Name	***Fa2h***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Fa2h* gene. The schematic diagram is as follows:



Technical routes

➢ The *Fa2h* gene has 4 transcripts. According to the structure of *Fa2h* gene, exon2-exon4 of *Fa2h-201* (ENSMUST00000038475.8) transcript is recommended as the knockout region.The region contains 343bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Fa2h* gene. The brief process is as follows: CRISPR/Cas9 system

Notice

- According to the existing MGI data,Homozygotes for a null allele show demyelination, axonal loss, and cerebellar dysfunction. Homozygotes for a different null allele show late onset axon and myelin sheath degeneration, delayed fur emergence, altered sebum composition, sebocyte hyperproliferation, and cyclic alopecia.

- The *Fa2h* gene is located on the Chr8. 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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Fa2h fatty acid 2-hydroxylase [Mus musculus (house mouse)]

Gene ID: 338521, updated on 19-Mar-2019

Summary

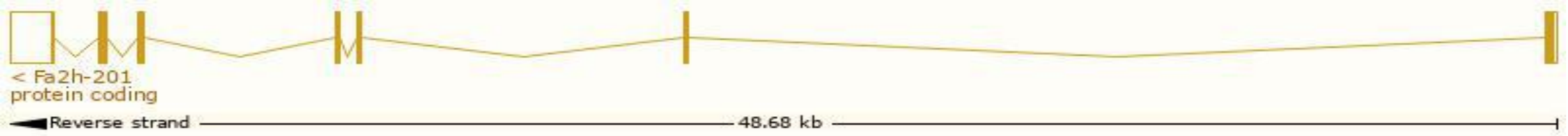
Official Symbol	Fa2h provided by MGI
Official Full Name	fatty acid 2-hydroxylase provided by MGI
Primary source	MGI:MGI:2443327
See related	Ensembl:ENSMUSG00000033579
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	FAAH, Faxdc1, G630055L08Rik
Expression	Biased expression in stomach adult (RPKM 77.1), colon adult (RPKM 59.1) and 8 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

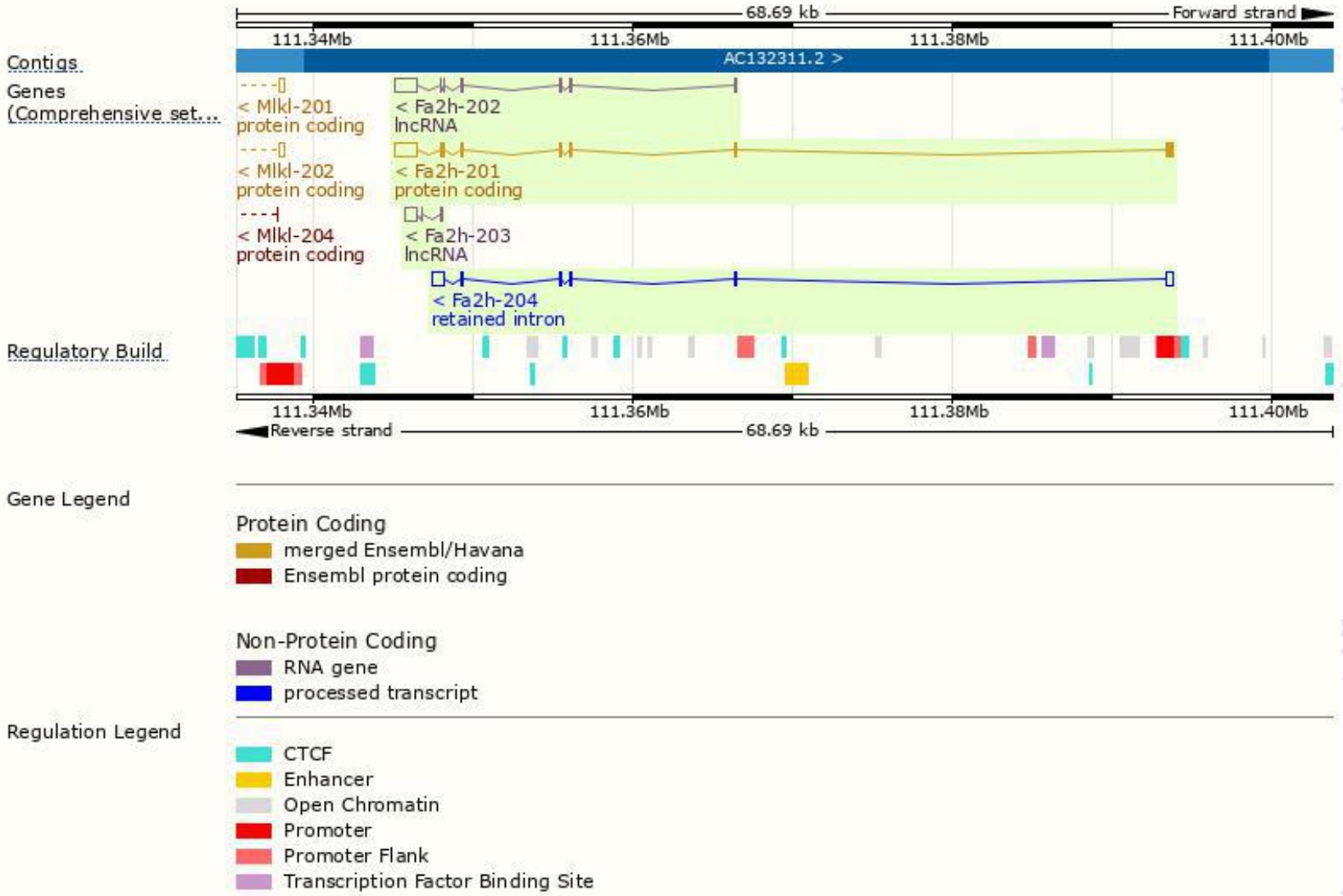
The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Fa2h-201	ENSMUST00000038475.8	2492	372aa	Protein coding	CCDS22674	Q5MPP0	TSL:1 GENCODE basic APPRIS P1
Fa2h-204	ENSMUST00000162463.1	1566	No protein	Retained intron	-	-	TSL:1
Fa2h-202	ENSMUST00000159336.7	1971	No protein	lncRNA	-	-	TSL:5
Fa2h-203	ENSMUST00000162216.1	933	No protein	lncRNA	-	-	TSL:3

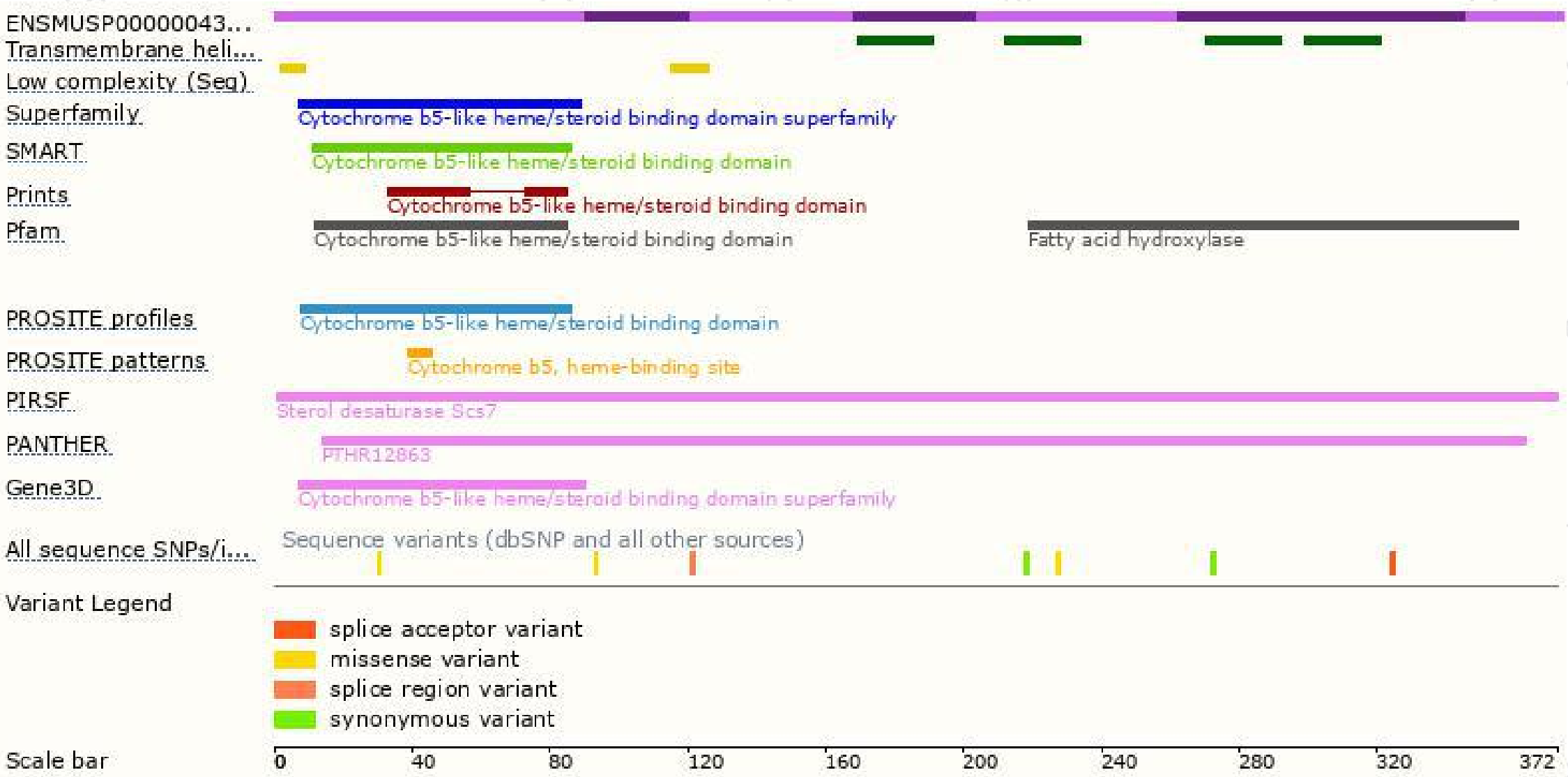
The strategy is based on the design of *Fa2h-201* transcript,The transcription is shown below



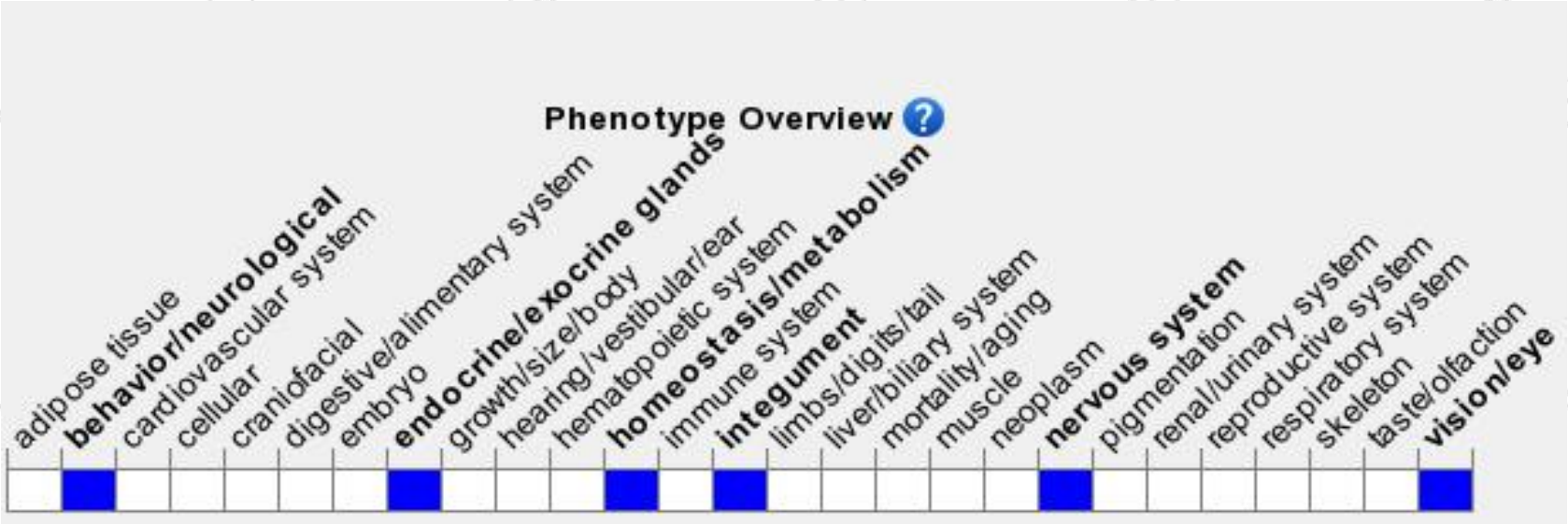
Genomic location distribution



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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