Hdac6 Cas9-CKO Strategy

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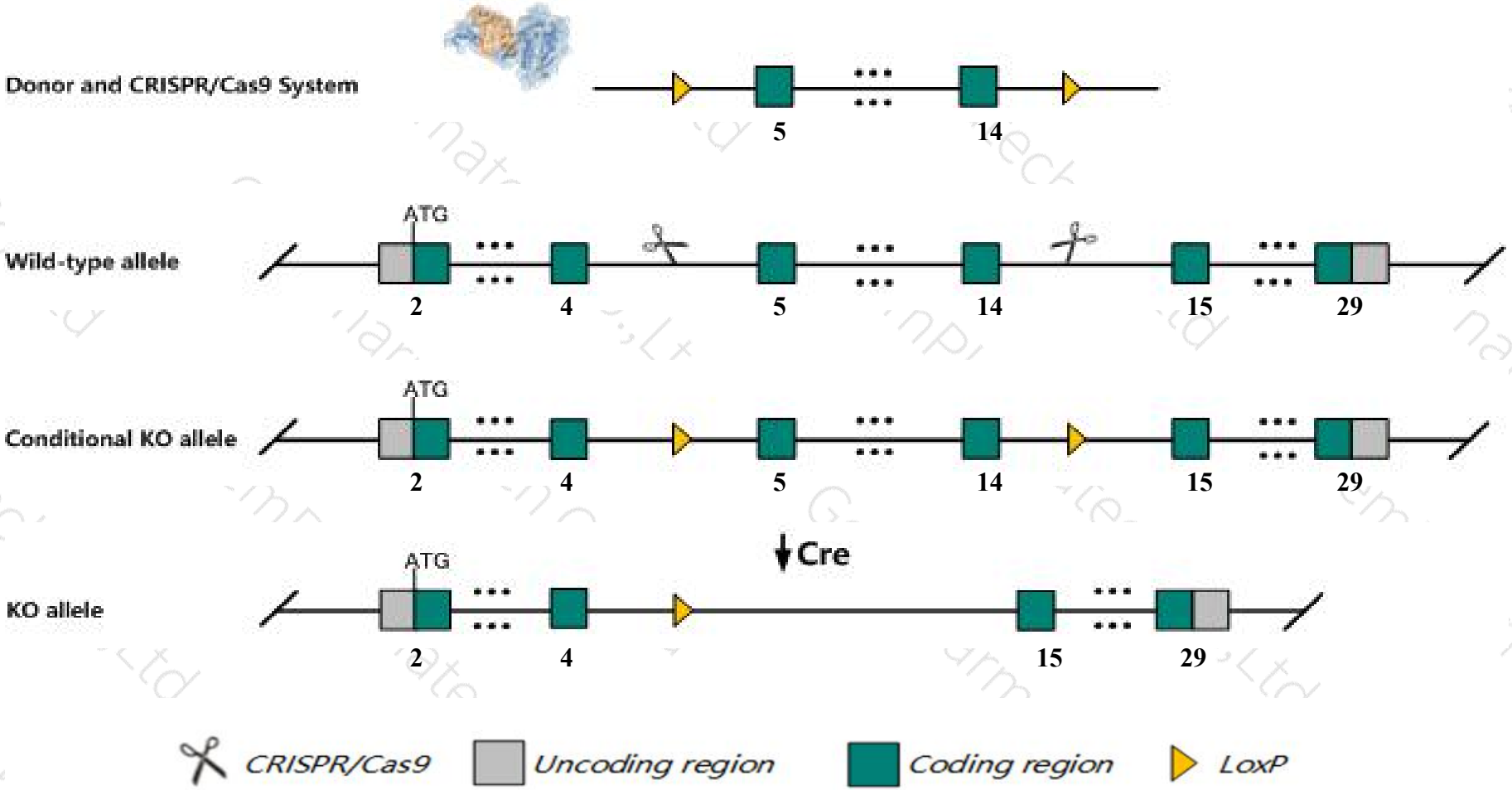
Project Overview

Project Name	***Hdac6***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Hdac6* gene. The schematic diagram is as follows:



Technical routes

- The *Hdac6* gene has 10 transcripts. According to the structure of *Hdac6* gene, exon5-exon14 of *Hdac6-201* (ENSMUST00000033501.14) transcript is recommended as the knockout region.The region contains 838bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Hdac6* 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,Although mice homozygous for a knock-out allele exhibit global tubulin hyperacetylation, they are viable and fertile and display only a moderately impaired immune response and a minor increase in cancellous bone mineral density.

➢ The *Hdac6* gene is located on the ChrX. 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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Hdac6 histone deacetylase 6 [Mus musculus (house mouse)]

Gene ID: 15185, updated on 9-Apr-2019

Summary

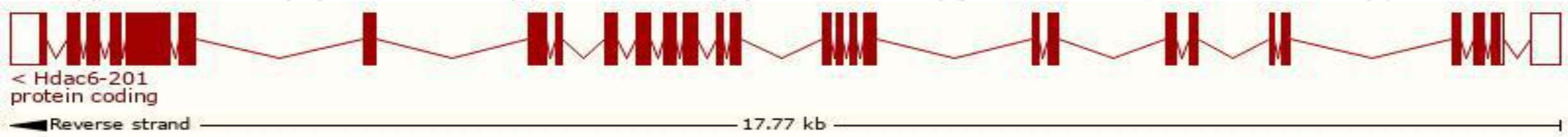
Official Symbol	Hdac6 provided by MGI
Official Full Name	histone deacetylase 6 provided by MGI
Primary source	MGI:MGI:1333752
See related	Ensembl:ENSMUSG00000031161
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Hd6, Hdac5, Sfc6, mHDA2
Expression	Ubiquitous expression in genital fat pad adult (RPKM 65.5), whole brain E14.5 (RPKM 26.3) and 27 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

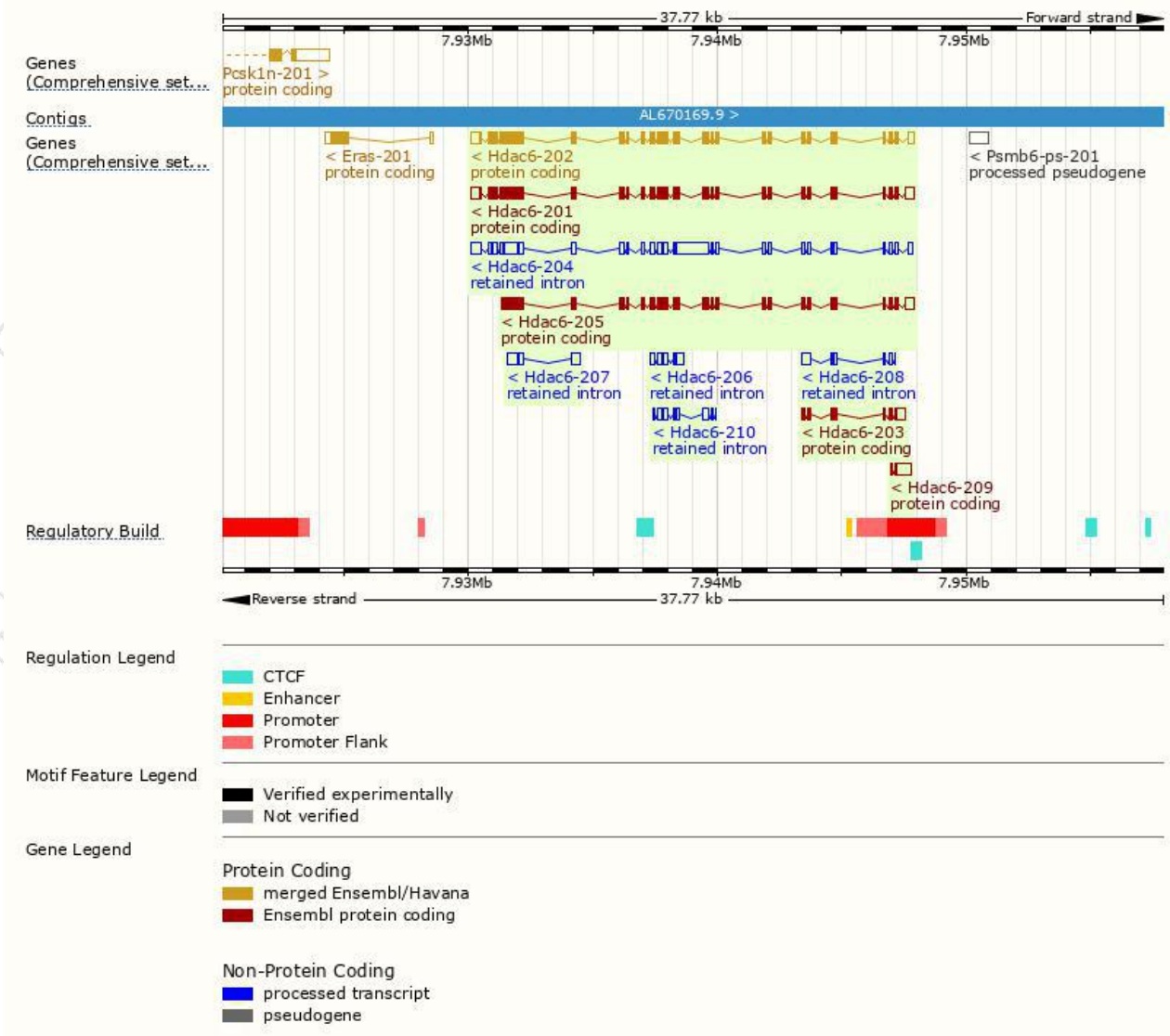
The gene has 10 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Hdac6-201	ENSMUST00000033501.14	4142	1149aa	Protein coding	CCDS40845	Q9Z2V5	TSL:5 GENCODE basic APPRIS P1
Hdac6-202	ENSMUST00000115642.7	4069	1149aa	Protein coding	CCDS40845	Q9Z2V5	TSL:1 GENCODE basic APPRIS P1
Hdac6-205	ENSMUST00000145675.7	3371	1008aa	Protein coding	-	A0A1B0GX25	CDS 3' incomplete TSL:1
Hdac6-203	ENSMUST00000133349.1	932	197aa	Protein coding	-	B1AUA8	CDS 3' incomplete TSL:3
Hdac6-209	ENSMUST00000154244.1	678	41aa	Protein coding	-	B1AUA9	CDS 3' incomplete TSL:3
Hdac6-204	ENSMUST00000137499.7	5037	No protein	Retained intron	-	-	TSL:2
Hdac6-207	ENSMUST00000153788.1	894	No protein	Retained intron	-	-	TSL:5
Hdac6-210	ENSMUST00000156127.1	853	No protein	Retained intron	-	-	TSL:5
Hdac6-206	ENSMUST00000151916.7	804	No protein	Retained intron	-	-	TSL:5
Hdac6-208	ENSMUST00000154200.1	718	No protein	Retained intron	-	-	TSL:2

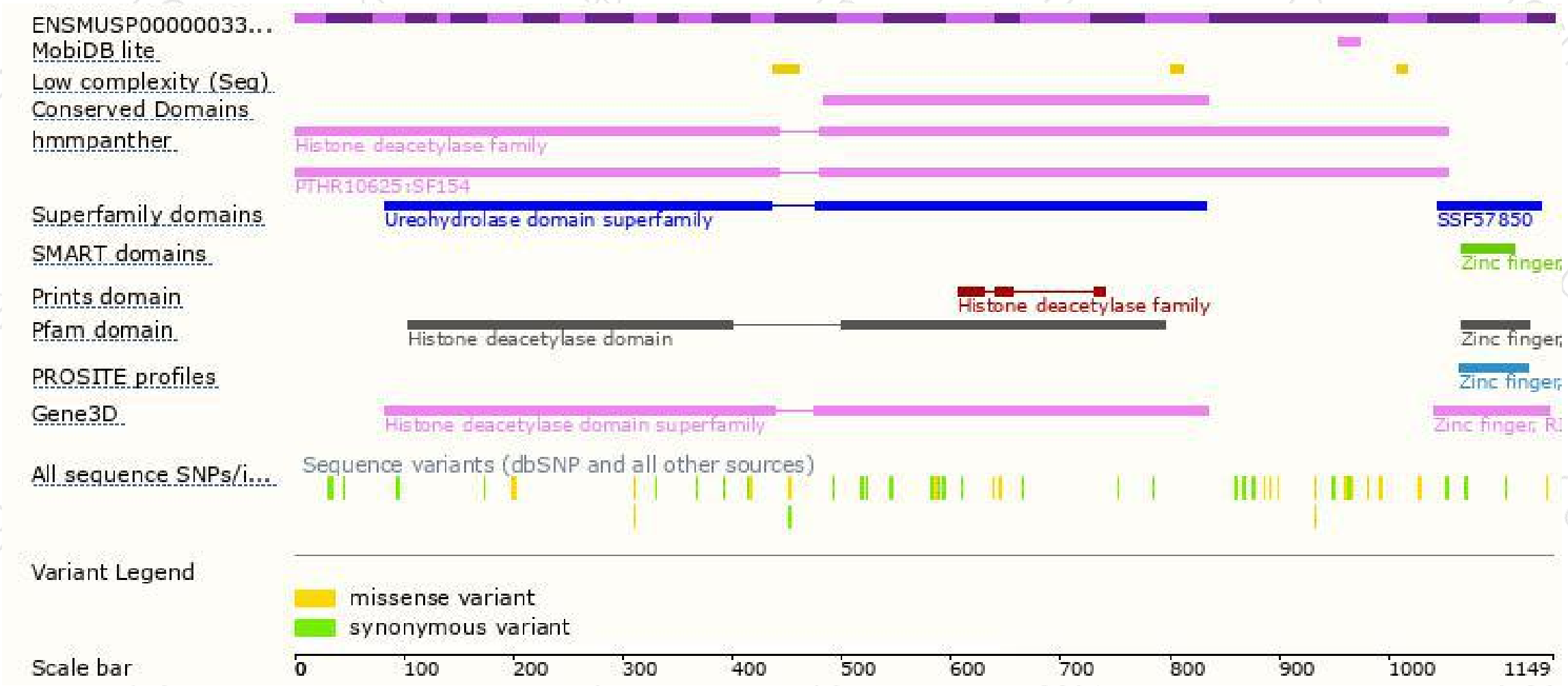
The strategy is based on the design of *Hdac6-201* transcript,The transcription is shown below



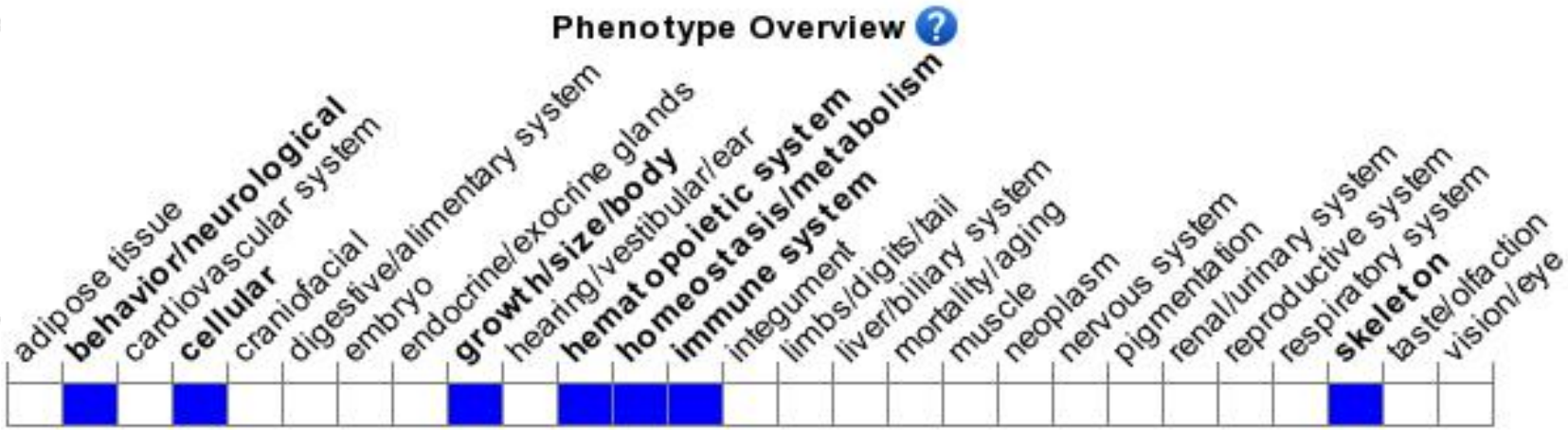
Genomic location distribution



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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