

***Hrh1* Cas9-CKO Strategy**

Designer:

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Design Date:

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Project Overview

Project Name

Hrh1

Project type

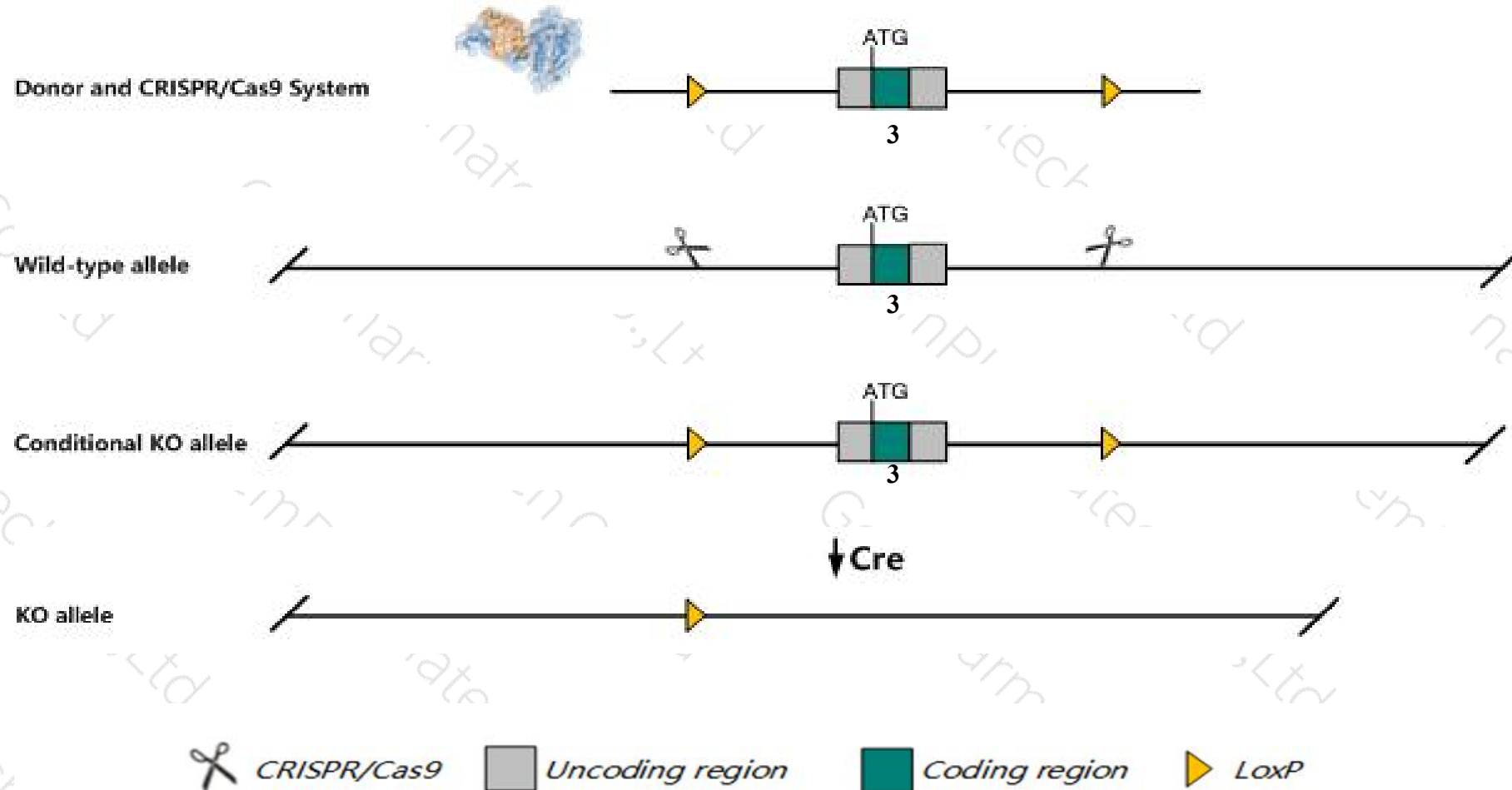
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Hrh1* gene. The schematic diagram is as follows:



Technical routes

- The *Hrh1* gene has 5 transcripts. According to the structure of *Hrh1* gene, exon3 of *Hrh1-201* (ENSMUST00000088987.2) transcript is recommended as the knockout region. The region contains all of the coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Hrh1* 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 null mutants show decrease in exploratory behavior, diurnal activity, aggression, anxiety, serotonin release, respiratory reaction to temperature and leptin response. Natural variants affect B. pertussis induced vasoactive amine sensitization.
- The *Hrh1* gene is located on the Chr6. 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)

Hrh1 histamine receptor H1 [Mus musculus (house mouse)]

Gene ID: 15465, updated on 19-Mar-2019

Summary



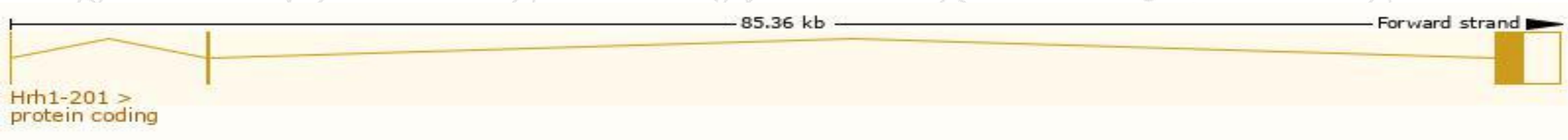
Official Symbol	Hrh1 provided by MGI
Official Full Name	histamine receptor H1 provided by MGI
Primary source	MGI:MGI:107619
See related	Ensembl:ENSMUSG00000053004
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Bphs, H1R, HH1R, Hir
Expression	Biased expression in cortex adult (RPKM 2.2), colon adult (RPKM 1.7) and 14 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

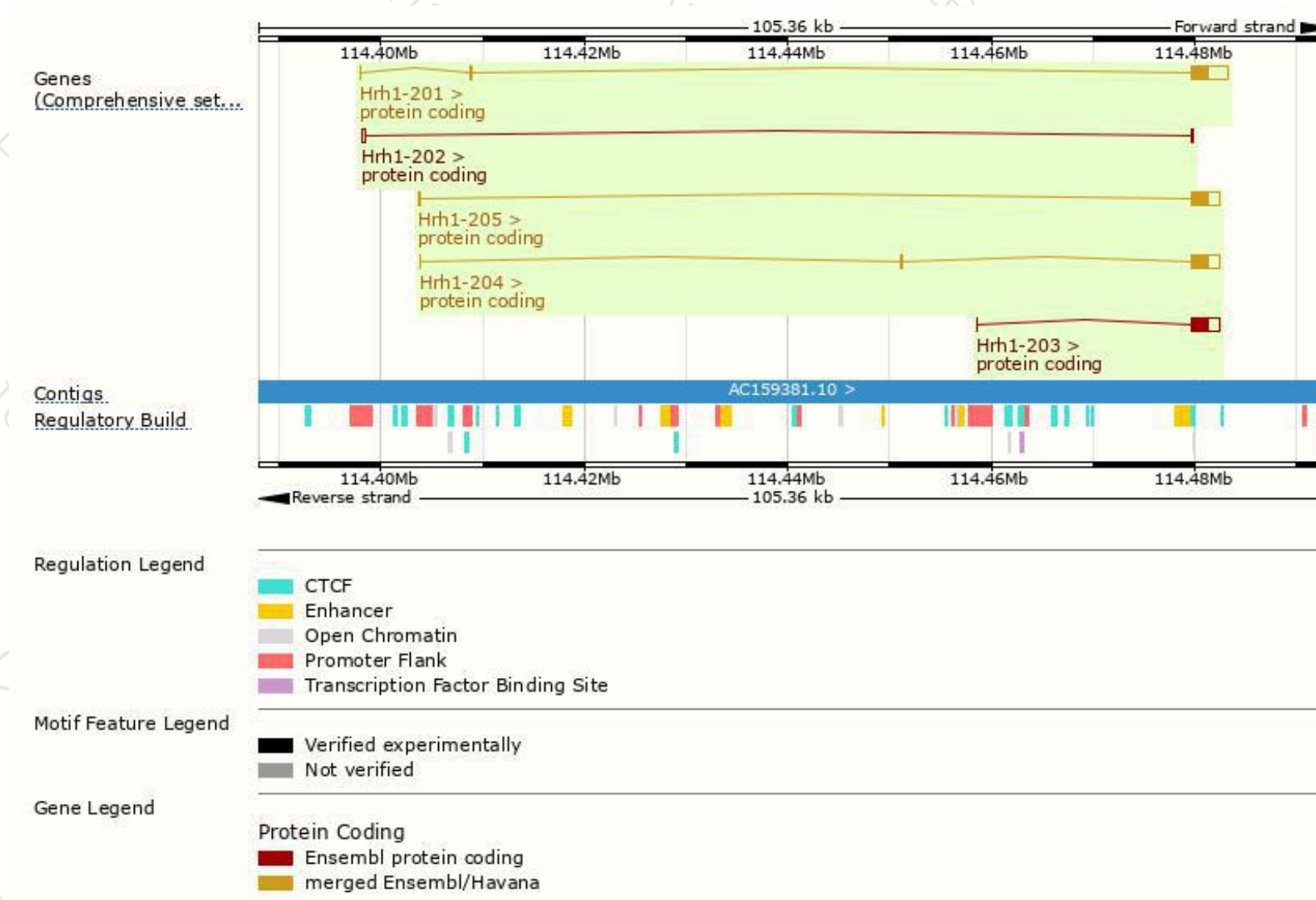
The gene has 5 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Hrh1-201	ENSMUST00000088987.2	3782	488aa	Protein coding	CCDS20435	B3Y5T0 P70174	TSL:1 GENCODE basic APPRIS P1
Hrh1-205	ENSMUST00000161650.2	2978	488aa	Protein coding	CCDS20435	B3Y5T0 P70174	TSL:1 GENCODE basic APPRIS P1
Hrh1-204	ENSMUST00000161220.1	2817	488aa	Protein coding	CCDS20435	B3Y5T0 P70174	TSL:1 GENCODE basic APPRIS P1
Hrh1-203	ENSMUST00000160780.1	2782	488aa	Protein coding	CCDS20435	B3Y5T0 P70174	TSL:5 GENCODE basic APPRIS P1
Hrh1-202	ENSMUST00000160212.1	476	35aa	Protein coding	-	E0CXH0	CDS 3' incomplete TSL:2

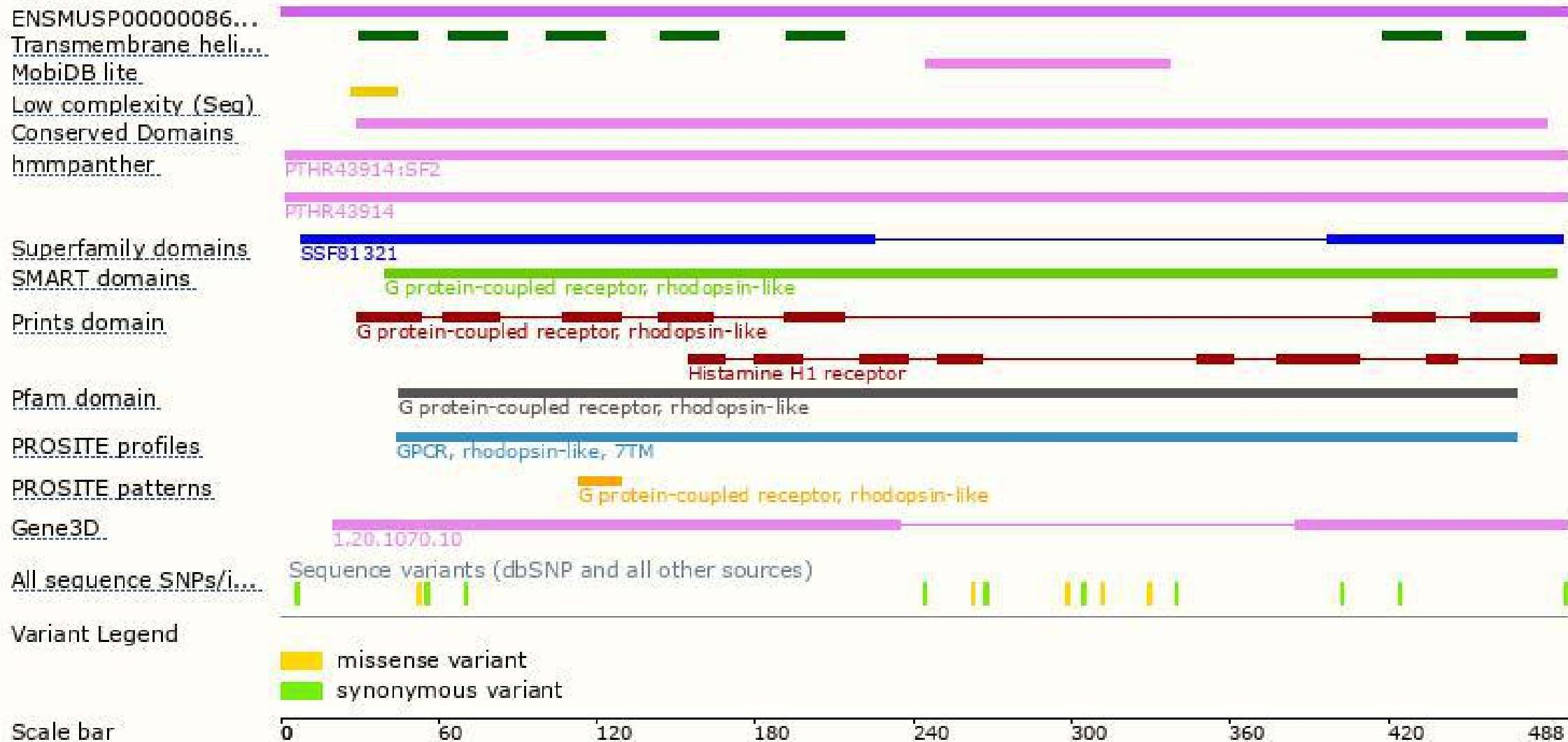
The strategy is based on the design of *Hrh1-201* transcript,The transcription is shown below



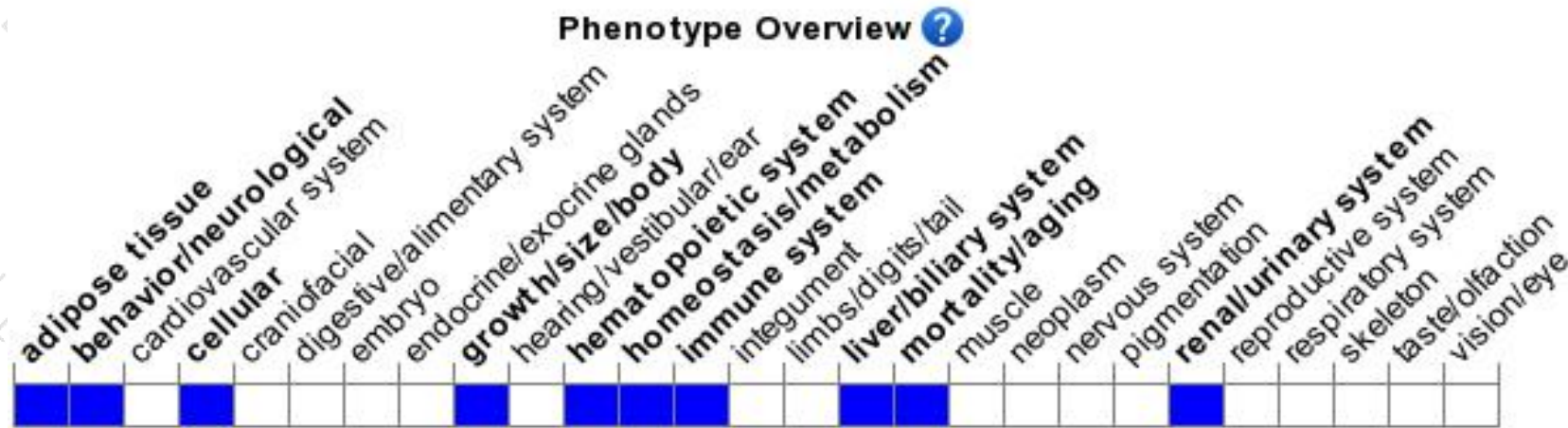
Genomic location distribution



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/>).

According to the existing MGI data, Homozygous null mutants show decrease in exploratory behavior, diurnal activity, aggression, anxiety, serotonin release, respiratory reaction to temperature and leptin response. Natural variants affect B. pertussis induced vasoactive amine sensitization.

If you have any questions, you are welcome to inquire.

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