

Gbx1 Cas9-KO Strategy

Designer: JiaYu

Reviewer: Xiaojing Li

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Project Overview



Project Name

Gbx1

Project type

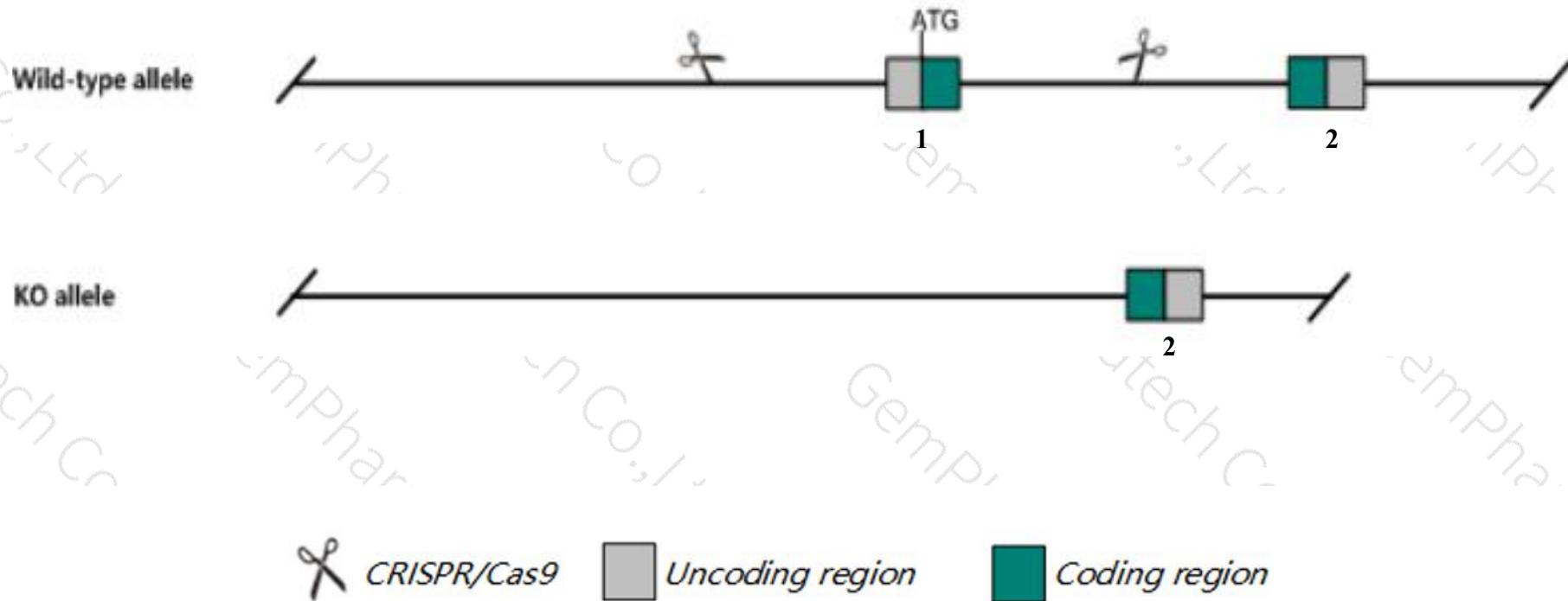
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Gbx1* gene. The schematic diagram is as follows:



- The *Gbx1* gene has 1 transcript. According to the structure of *Gbx1* gene, exon1 of *Gbx1-201*(ENSMUST00000088311.5) transcript is recommended as the knockout region. The region contains start codon ATG. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Gbx1* gene. The brief process is as follows: CRISPR/Cas9 system 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.

- According to the existing MGI data, mice homozygous for null alleles exhibit abnormal locomotor behavior affecting hindlimbs and neuron abnormalities. Neuronal abnormalities have been reported in some mice for motor neurons and GABAergic neurons and for proprioceptive sensory axons.
- The flox region is about 5.3 kb away from the 3' end of the *Asb10* gene, which may affect the regulation of this gene.
- The *Gbx1* gene is located on the Chr5. 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)

Gbx1 gastrulation brain homeobox 1 [Mus musculus (house mouse)]

Gene ID: 231044, updated on 13-Mar-2020

Summary



Official Symbol Gbx1 provided by [MGI](#)

Official Full Name gastrulation brain homeobox 1 provided by [MGI](#)

Primary source [MGI:MGI:95667](#)

See related [Ensembl:ENSMUSG00000067724](#)

Gene type protein coding

RefSeq status PROVISIONAL

Organism [Mus musculus](#)

Lineage Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus

Also known as Gbx-1

Expression Biased expression in CNS E14 (RPKM 1.1), whole brain E14.5 (RPKM 1.0) and 5 other tissues [See more](#)

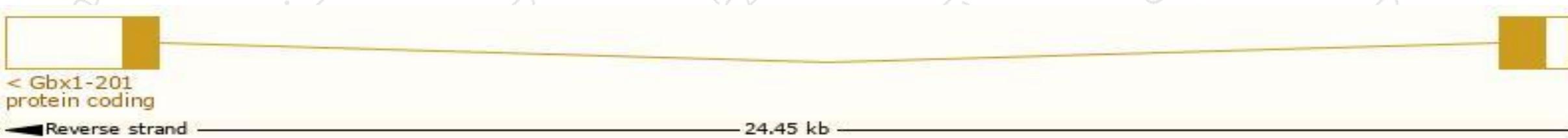
Orthologs [human all](#)

Transcript information (Ensembl)

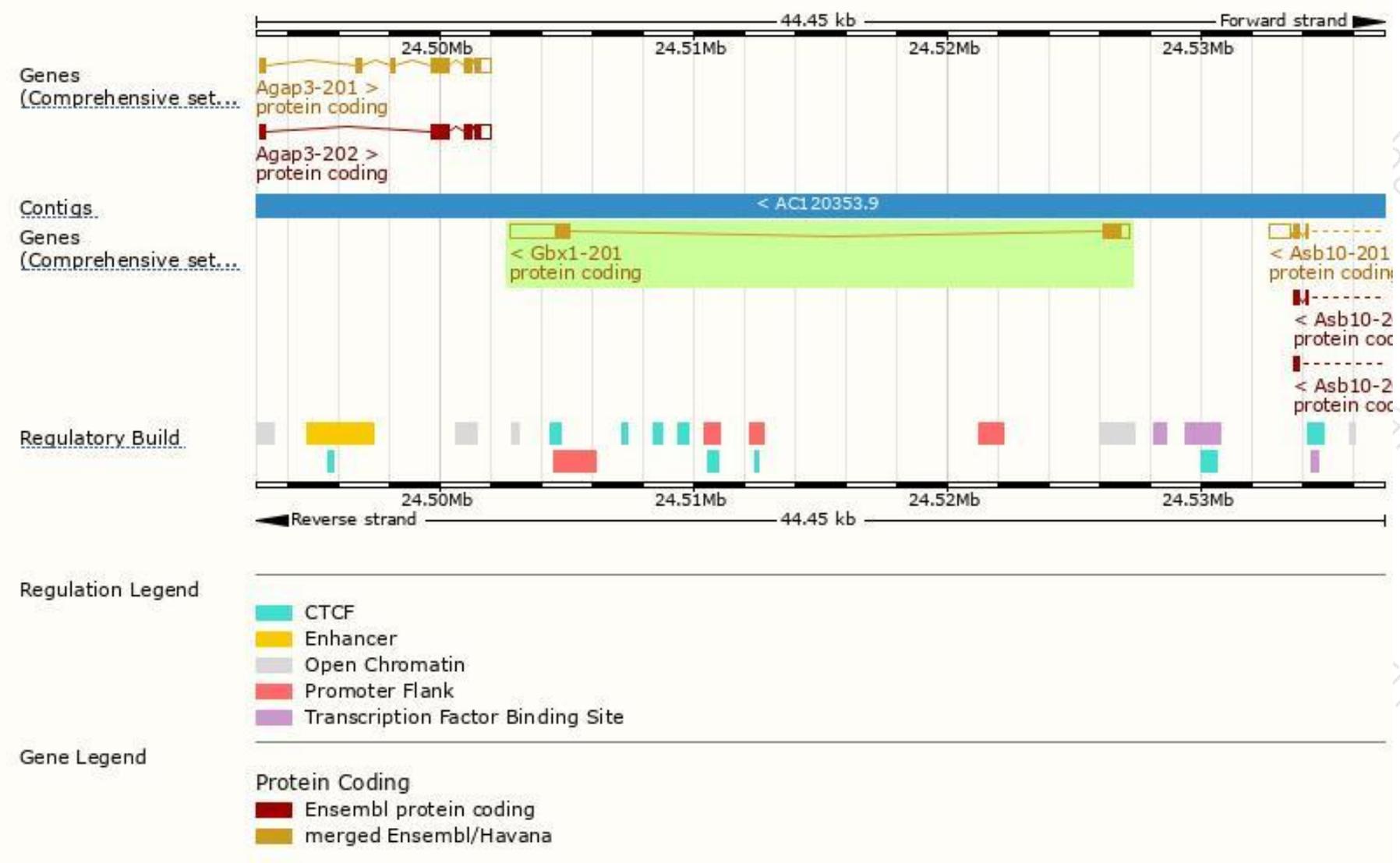
The gene has 1 transcript, and the transcript is shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Gbx1-201	ENSMUST00000088311.5	3475	418aa	Protein coding	CCDS19123	P82976	TSL:1 GENCODE basic APPRIS P1

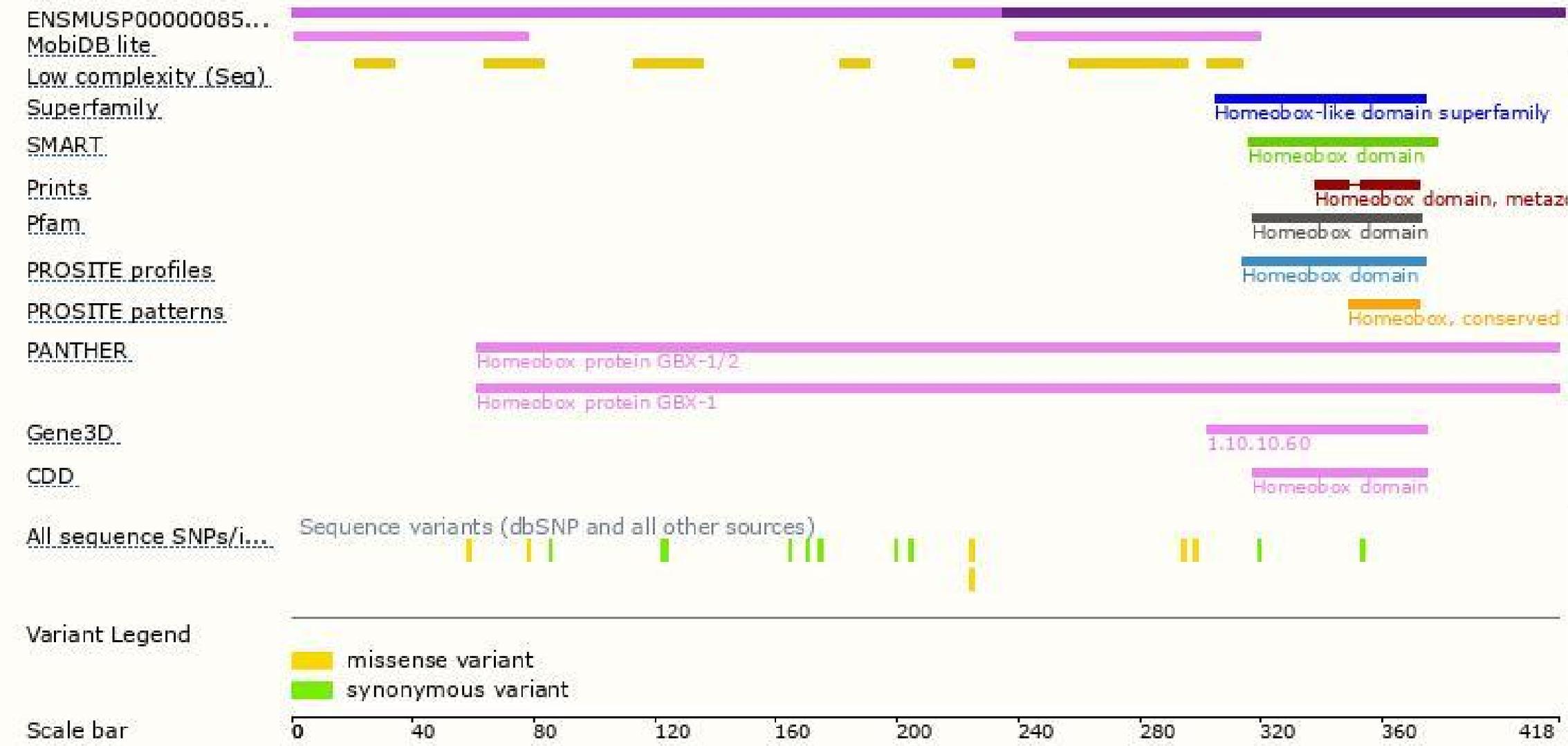
The strategy is based on the design of *Gbx1-201* transcript, the transcription is shown below:



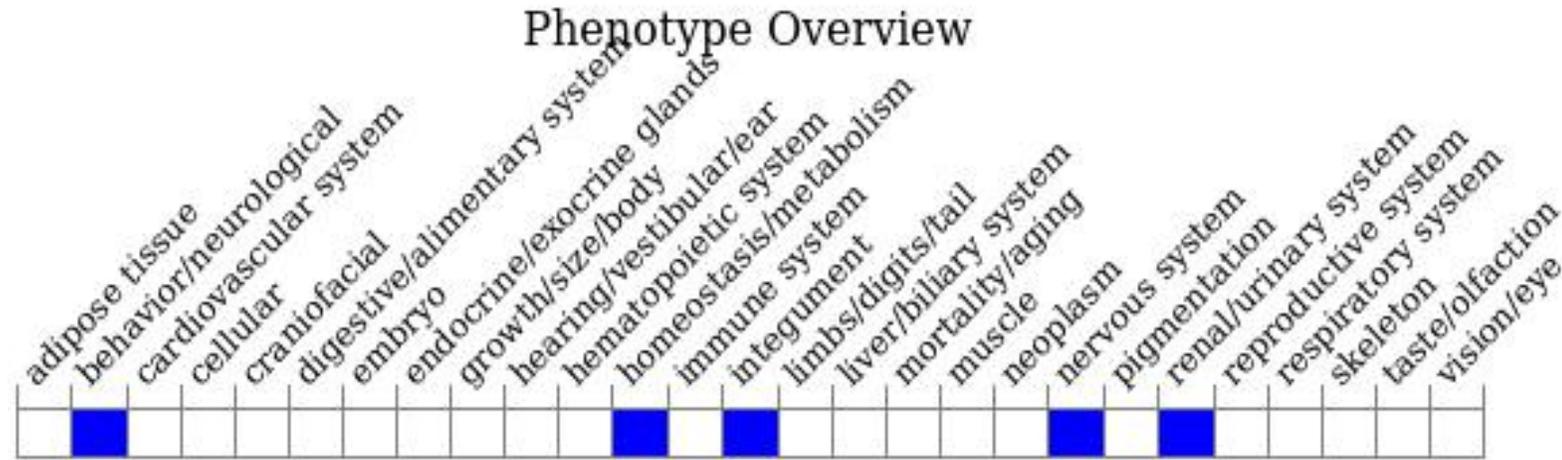
Genomic location distribution



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, mice homozygous for null alleles exhibit abnormal locomotor behavior affecting hindlimbs and neuron abnormalities. Neuronal abnormalities have been reported in some mice for motor neurons and GABAergic neurons and for proprioceptive sensory axons.

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

Tel: 400-9660890

