Fev Cas9-CKO Strategy

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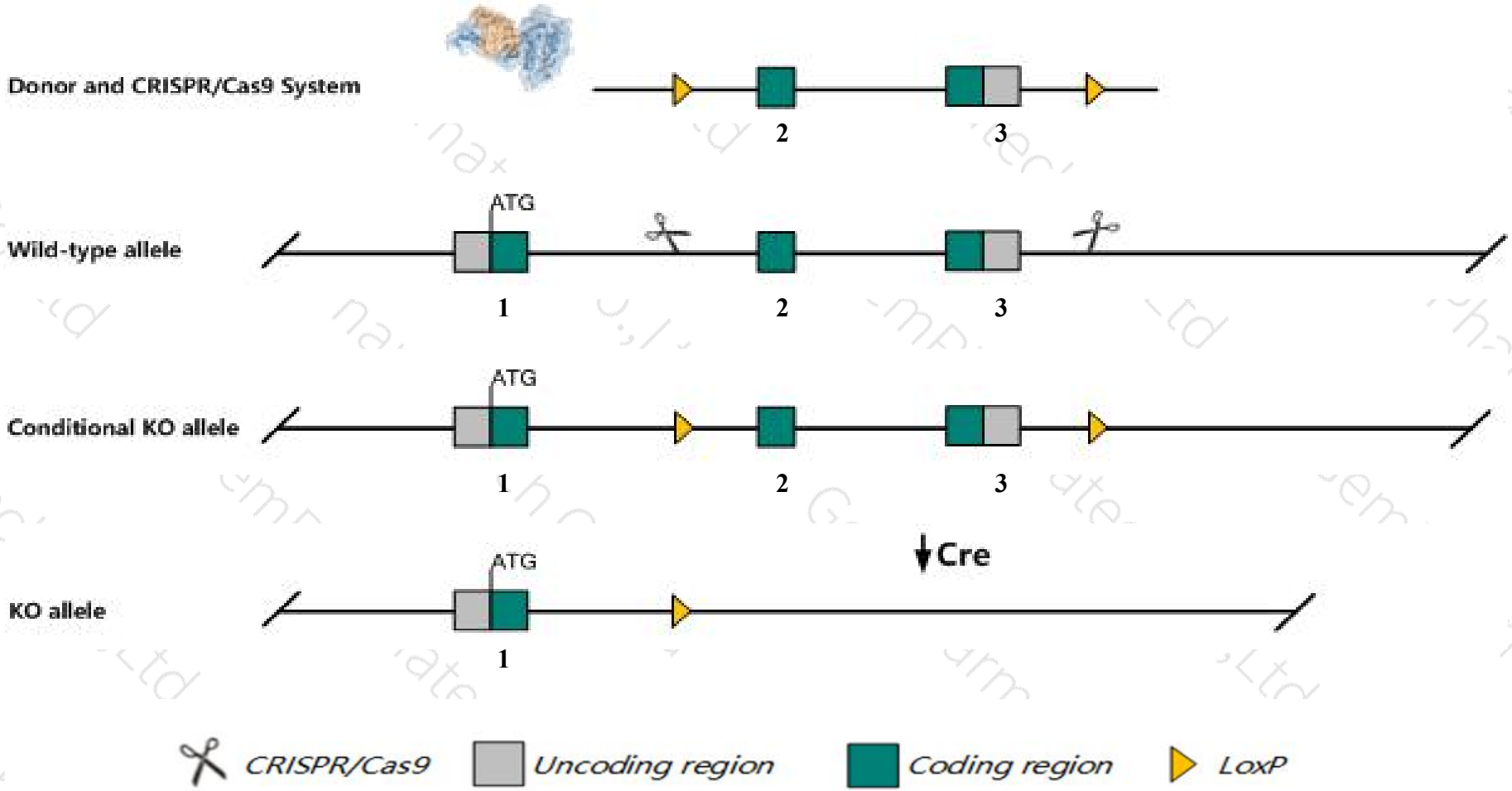
Project Overview

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

Conditional Knockout strategy

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



Technical routes

- The *Fev* gene has 3 transcripts. According to the structure of *Fev* gene, exon2-exon3 of *Fev-201* (ENSMUST00000068631.3) transcript is recommended as the knockout region.The region contains most 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 *Fev* 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,homozygous inactivation of this gene leads to partial lethality within the first week of life, causes impaired serotonergic neuron development, and results in increased anxiety-like and aggressive behavior in adulthood.
- The floxed region is near to the C-terminal of *Gm16582* gene,this strategy may influence the regulatory function of the C-terminal of *Gm16582* gene.
- The *Fev* gene is located on the Chr1. 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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Fev FEV transcription factor, ETS family member [Mus musculus (house mouse)]

Gene ID: 260298, updated on 13-Mar-2020

Summary

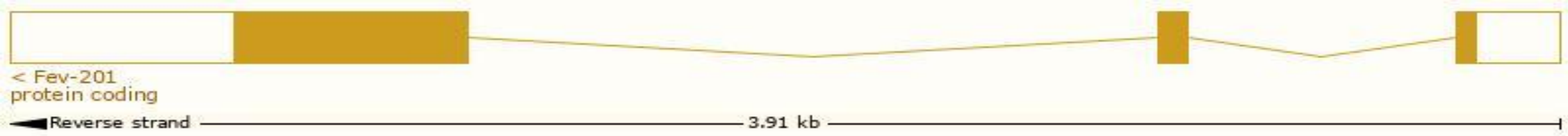
Official Symbol	Fev provided by MGI
Official Full Name	FEV transcription factor, ETS family member provided by MGI
Primary source	MGI:MGI:2449712
See related	Ensembl:ENSMUSG00000055197
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Pet-1, Pet1, Pex1, mPet-1
Expression	Biased expression in duodenum adult (RPKM 1.0), testis adult (RPKM 1.0) and 10 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

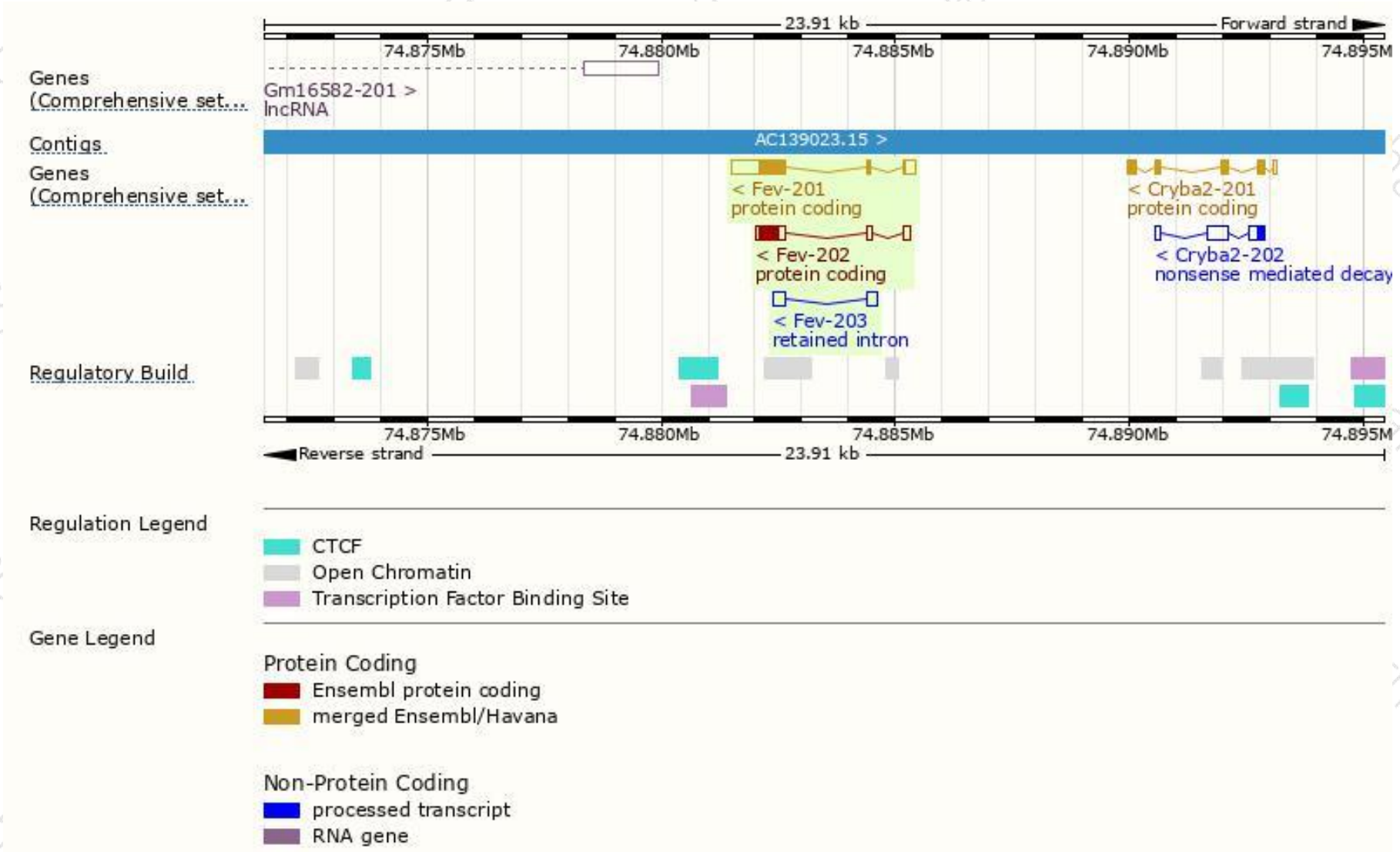
The gene has 3 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Fev-201	ENSMUST00000068631.3	1490	237aa	Protein coding	CCDS15058	Q8QZW2	TSL:1 GENCODE basic APPRIS P1
Fev-202	ENSMUST00000159232.1	928	142aa	Protein coding	-	E0CXR7	TSL:1 GENCODE basic
Fev-203	ENSMUST00000162938.1	458	No protein	Retained intron	-	-	TSL:2

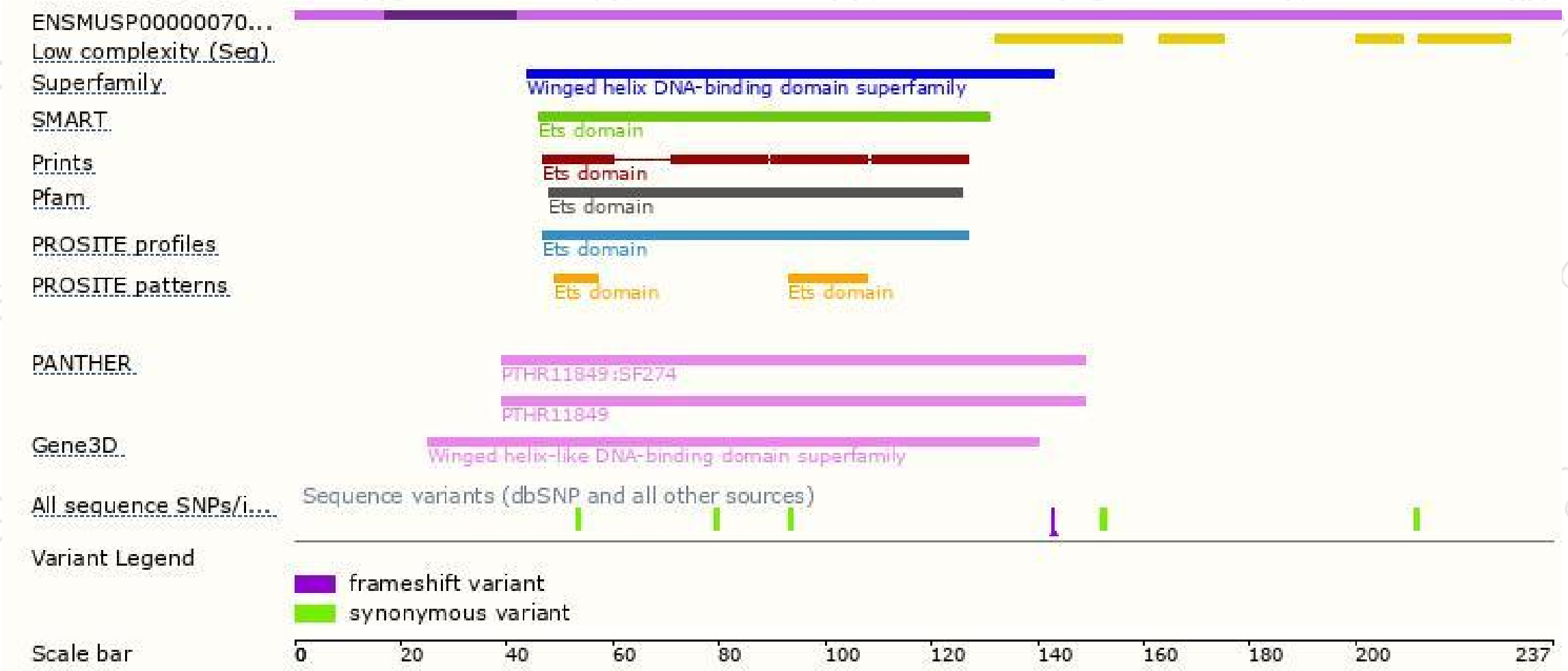
The strategy is based on the design of *Fev-201* transcript,the transcription is shown below:



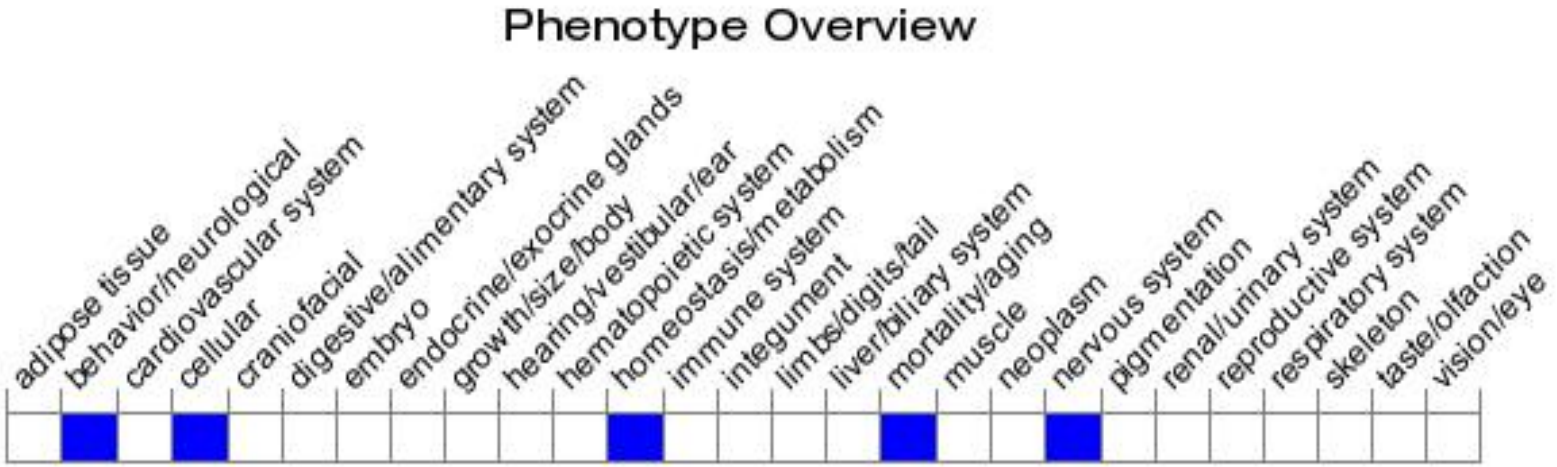
Genomic location distribution



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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