

***Fkbp5* Cas9-CKO Strategy**

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Reviewer: Yanhua Shen

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Project Overview

Project Name

Fkbp5

Project type

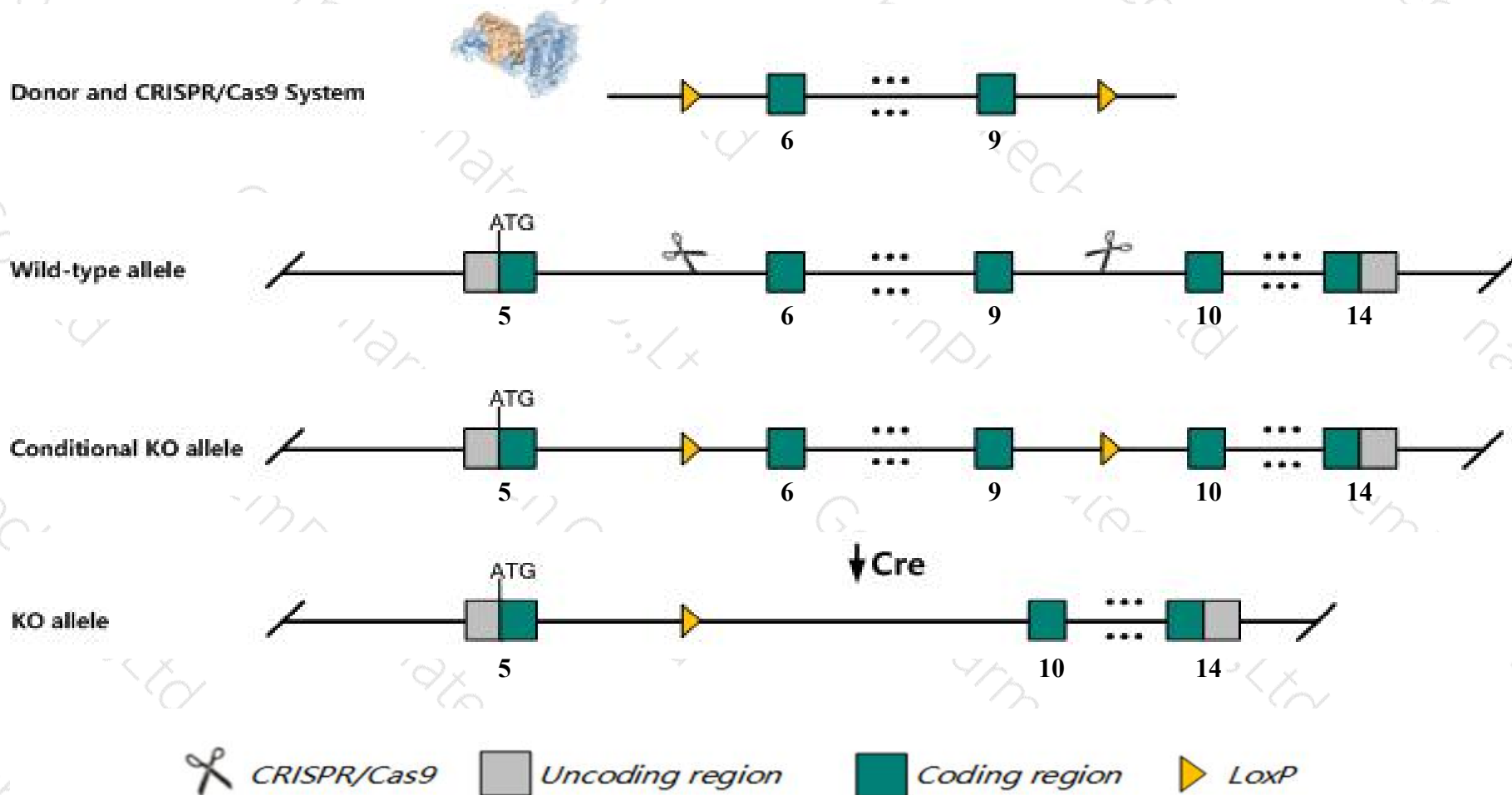
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Fkbp5* gene. The schematic diagram is as follows:



Technical routes

- The *Fkbp5* gene has 15 transcripts. According to the structure of *Fkbp5* gene, exon6-exon9 of *Fkbp5*-202 (ENSMUST00000114792.7) transcript is recommended as the knockout region. The region contains 560bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Fkbp5* 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, Mice homozygous for a null allele are normal and fertile. Mice homozygous for another knock-out allele exhibit decreased depression-related behavior and increased anxiety-related behavior.
- Transcript *Fkbp5*-204&207&215 may not be affected.
- *Gm49838* gene will be deleted together in this strategy.
- The *Fkbp5* gene is located on the Chr17. 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)

Fkbp5 FK506 binding protein 5 [*Mus musculus* (house mouse)]

Gene ID: 14229, updated on 24-Sep-2019

Summary

Official Symbol Fkbp5 provided by [MGI](#)
Official Full Name FK506 binding protein 5 provided by [MGI](#)
Primary source [MGI:MGI:104670](#)
See related [Ensembl:ENSMUSG00000024222](#)
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 Dit1; FKBP-5; FKBP51; D17Etd592e
Expression Broad expression in ovary adult (RPKM 58.3), genital fat pad adult (RPKM 40.8) and 21 other tissues [See more](#)
Orthologs [human](#) [all](#)

Genomic context

Location: 17 A3.3; 17 14.66 cM

See Fkbp5 in [Genome Data Viewer](#)

Exon count: 11

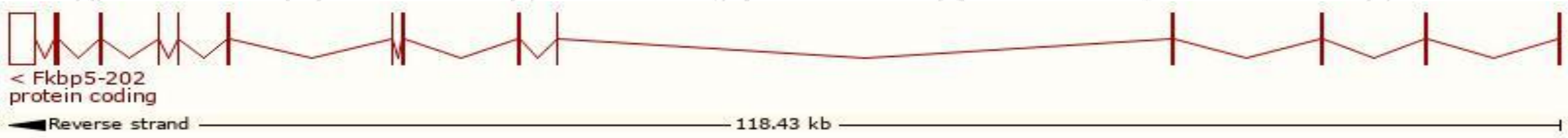
Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	17	NC_000083.6 (28398753..28486149, complement)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	17	NC_000083.5 (28536040..28578001, complement)

Transcript information (Ensembl)

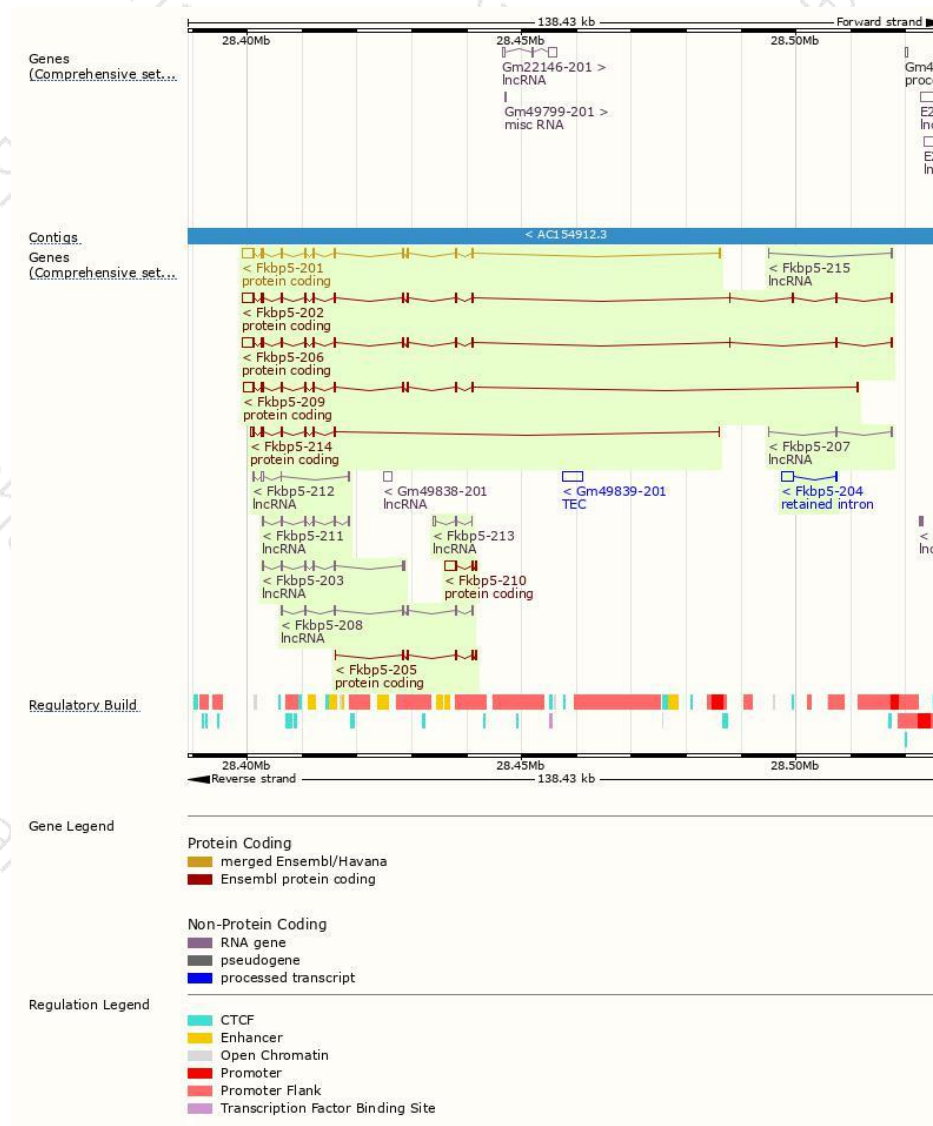
The gene has 15 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Fkbp5-202	ENSMUST00000114792.7	3858	456aa	Protein coding	CCDS37528	Q4FJN2_Q64378	TSL:2 GENCODE basic APPRIS P1
Fkbp5-206	ENSMUST00000177939.7	3844	456aa	Protein coding	CCDS37528	Q4FJN2_Q64378	TSL:5 GENCODE basic APPRIS P1
Fkbp5-201	ENSMUST00000079413.10	3543	456aa	Protein coding	CCDS37528	Q4FJN2_Q64378	TSL:1 GENCODE basic APPRIS P1
Fkbp5-209	ENSMUST00000233102.1	3486	456aa	Protein coding	CCDS37528	Q4FJN2_Q64378	GENCODE basic APPRIS P1
Fkbp5-210	ENSMUST00000233291.1	2431	93aa	Protein coding	-	A0A3B2WCL4	GENCODE basic
Fkbp5-214	ENSMUST00000233870.1	1414	248aa	Protein coding	-	A0A3B2WBD2	GENCODE basic
Fkbp5-205	ENSMUST00000153744.1	777	191aa	Protein coding	-	B8JJC2	CDS 3' incomplete TSL:5
Fkbp5-204	ENSMUST00000147716.1	2247	No protein	Retained intron	-	-	TSL:1
Fkbp5-208	ENSMUST00000232939.1	956	No protein	lncRNA	-	-	
Fkbp5-203	ENSMUST00000143685.2	838	No protein	lncRNA	-	-	TSL:3
Fkbp5-211	ENSMUST00000233307.1	817	No protein	lncRNA	-	-	
Fkbp5-213	ENSMUST00000233747.1	749	No protein	lncRNA	-	-	
Fkbp5-212	ENSMUST00000233372.1	615	No protein	lncRNA	-	-	
Fkbp5-207	ENSMUST00000232690.1	436	No protein	lncRNA	-	-	
Fkbp5-215	ENSMUST00000233917.1	309	No protein	lncRNA	-	-	

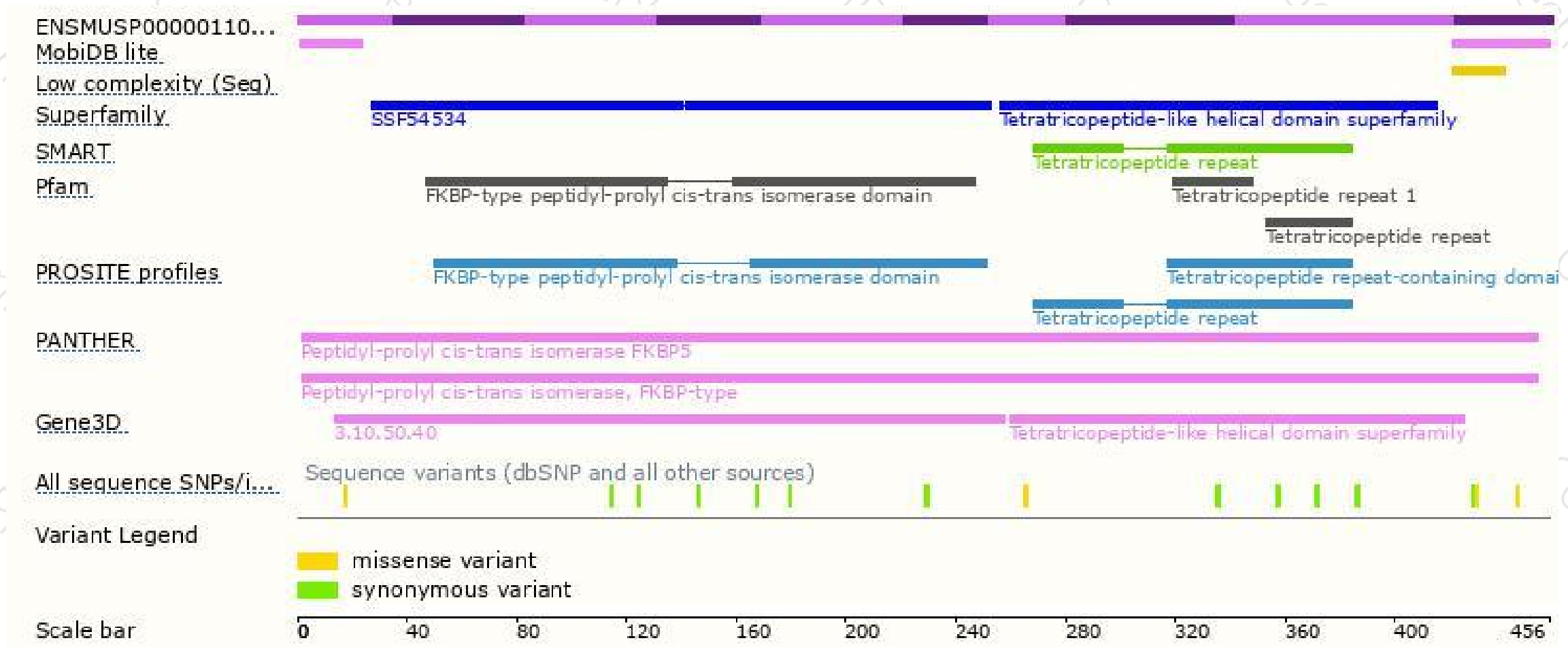
The strategy is based on the design of *Fkbp5-202* transcript,The transcription is shown below



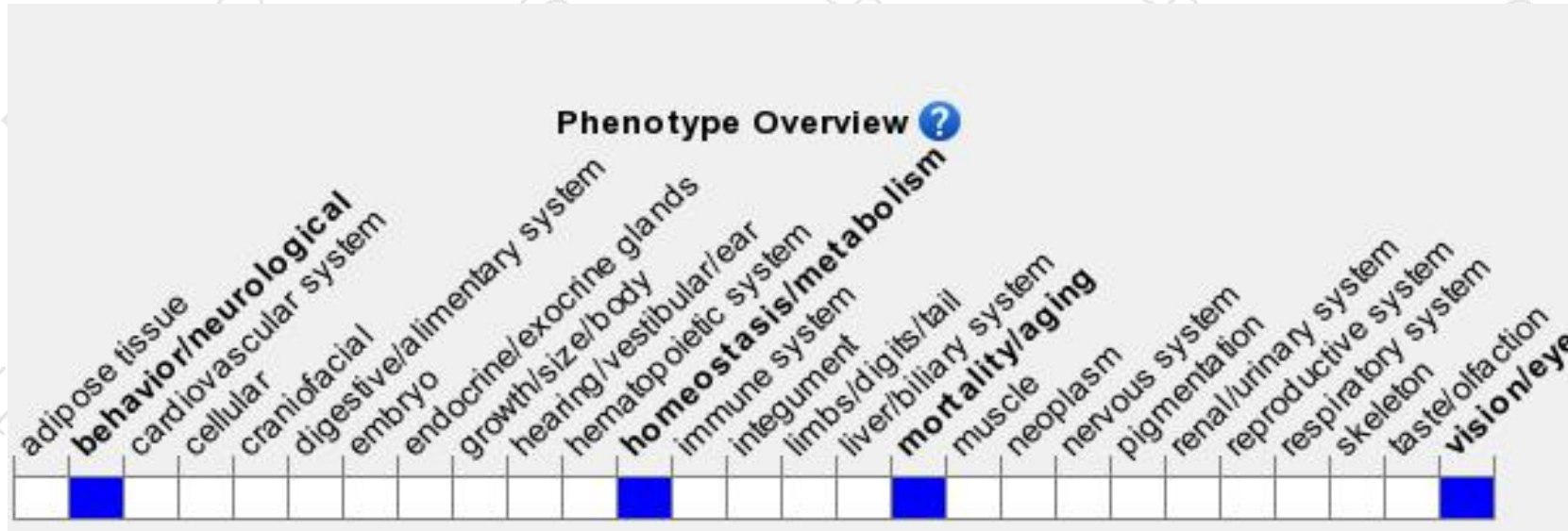
Genomic location distribution



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 a null allele are normal and fertile. Mice homozygous for another knock-out allele exhibit decreased depression-related behavior and increased anxiety-related behavior.

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

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