

Usp2 Cas9-CKO Strategy

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Project Overview

Project Name

Usp2

Project type

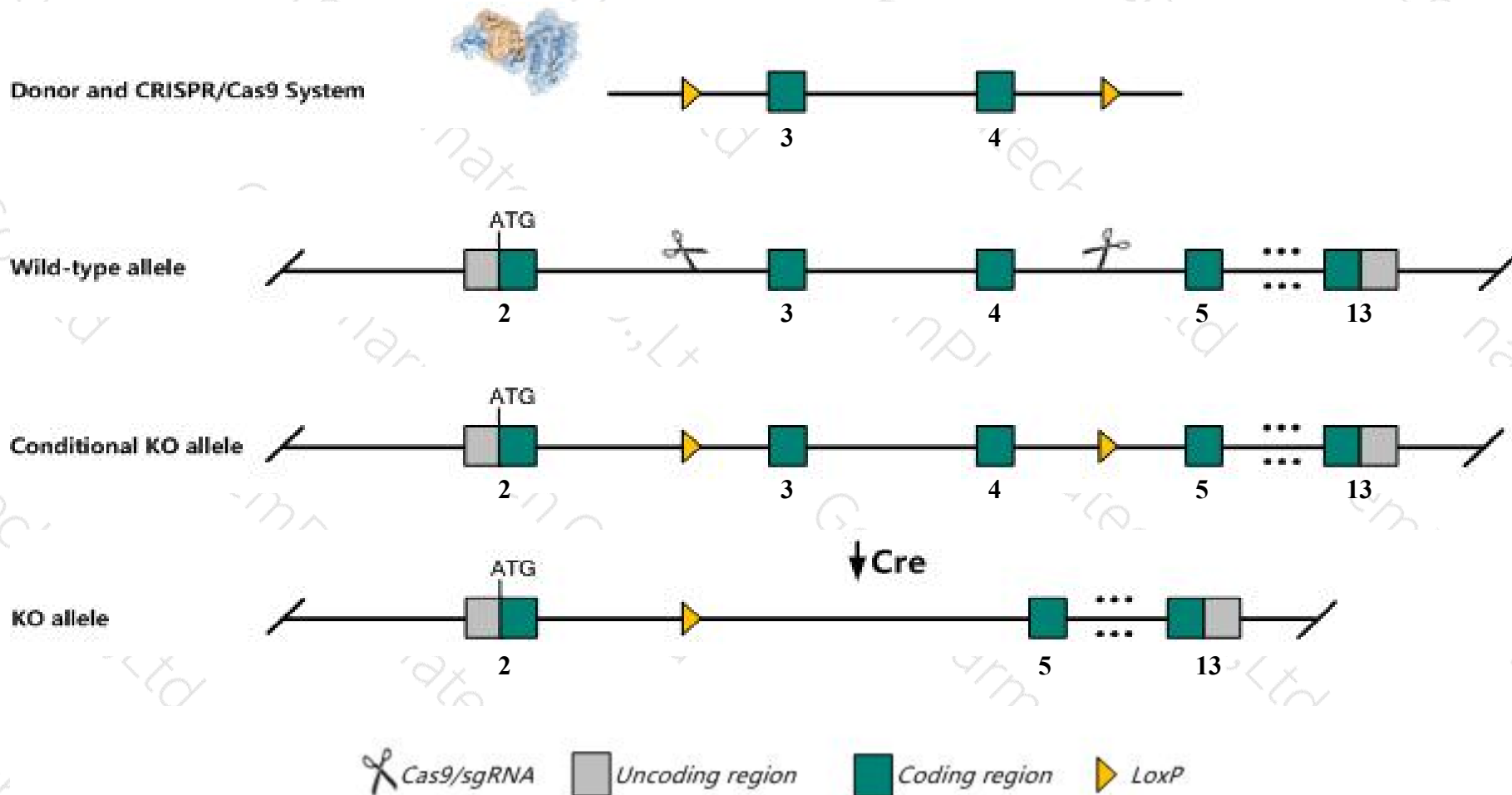
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Usp2* gene. The schematic diagram is as follows:



- The *Usp2* gene has 9 transcripts. According to the structure of *Usp2* gene, exon3-exon4 of *Usp2-201* (ENSMUST00000034508.13) transcript is recommended as the knockout region. The region contains 175bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Usp2* gene. The brief process is as follows: sgRNA was transcribed in vitro, donor vector was constructed. Cas9, sgRNA 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 was 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 mutation display severely reduced male fertility with defects in sperm motility.
- Transcript *Usp2*-205&209 may not be affected.
- The partial intron of *Gm49380* gene will be deleted together in this strategy.
- The *Usp2* gene is located on the Chr9. 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)

Usp2 ubiquitin specific peptidase 2 [Mus musculus (house mouse)]

Gene ID: 53376, updated on 31-Jan-2019

Summary



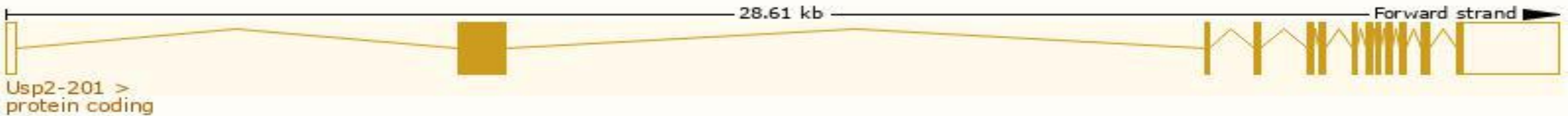
Official Symbol	Usp2 provided by MGI
Official Full Name	ubiquitin specific peptidase 2 provided by MGI
Primary source	MGI:MGI:1858178
See related	Ensembl:ENSMUSG00000032010
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	B930035K21Rik, Ubp41
Expression	Biased expression in testis adult (RPKM 55.3), heart adult (RPKM 6.4) and 5 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

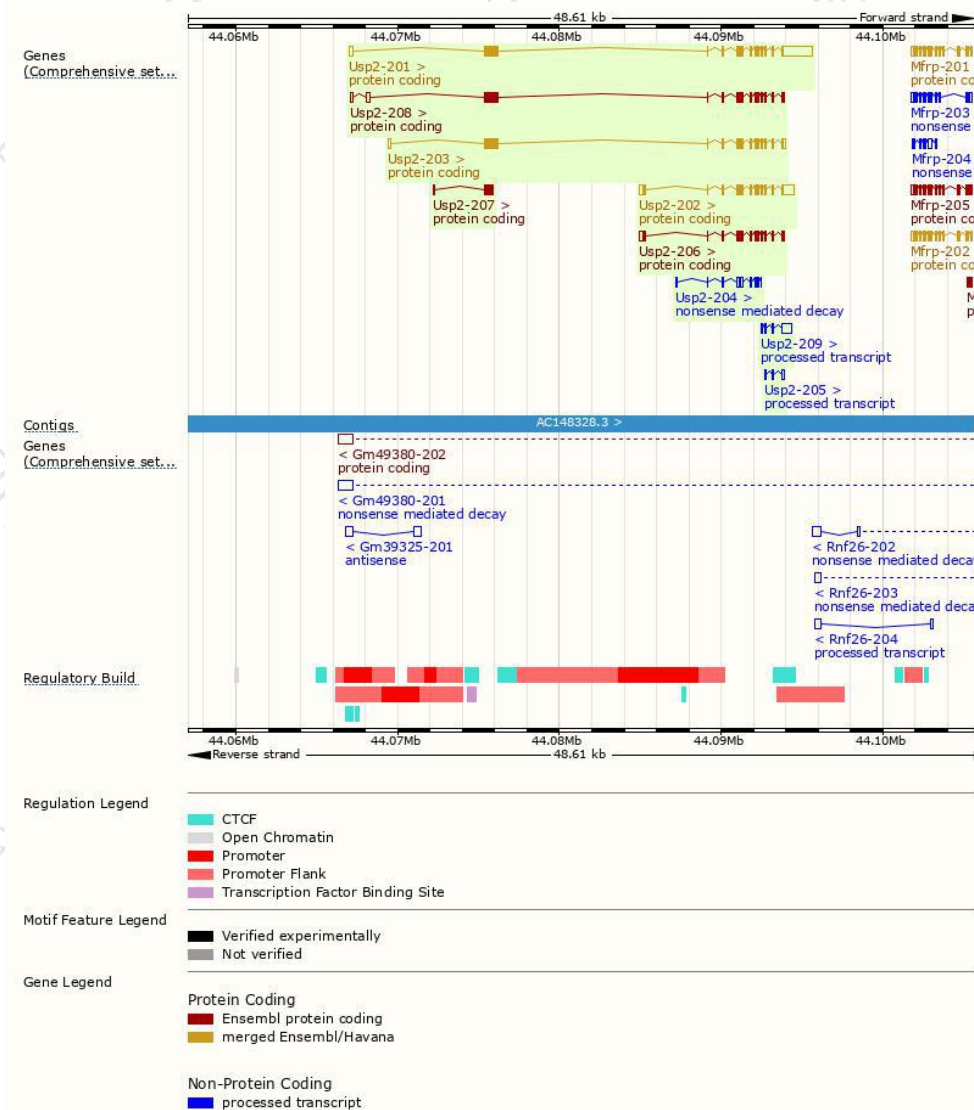
The gene has 9 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Usp2-201	ENSMUST00000034508.13	3867	619aa	Protein coding	CCDS23094	O88623	TSL:1 GENCODE basic
Usp2-208	ENSMUST00000177054.7	2370	619aa	Protein coding	CCDS23094	O88623	TSL:1 GENCODE basic
Usp2-203	ENSMUST00000114830.8	2122	619aa	Protein coding	CCDS23094	O88623	TSL:1 GENCODE basic
Usp2-202	ENSMUST00000065461.8	2057	396aa	Protein coding	CCDS23095	O88623	TSL:1 GENCODE basic APPRIS P2
Usp2-206	ENSMUST00000176416.7	1486	393aa	Protein coding	-	O88623	TSL:1 GENCODE basic APPRIS ALT 1
Usp2-207	ENSMUST00000176671.1	659	174aa	Protein coding	-	H3BLN9	CDS 3' incomplete TSL:3
Usp2-204	ENSMUST00000175816.1	748	43aa	Nonsense mediated decay	-	H3BLH3	TSL:3
Usp2-209	ENSMUST00000177422.7	908	No protein	Processed transcript	-	-	TSL:2
Usp2-205	ENSMUST00000176022.1	417	No protein	Processed transcript	-	-	TSL:2

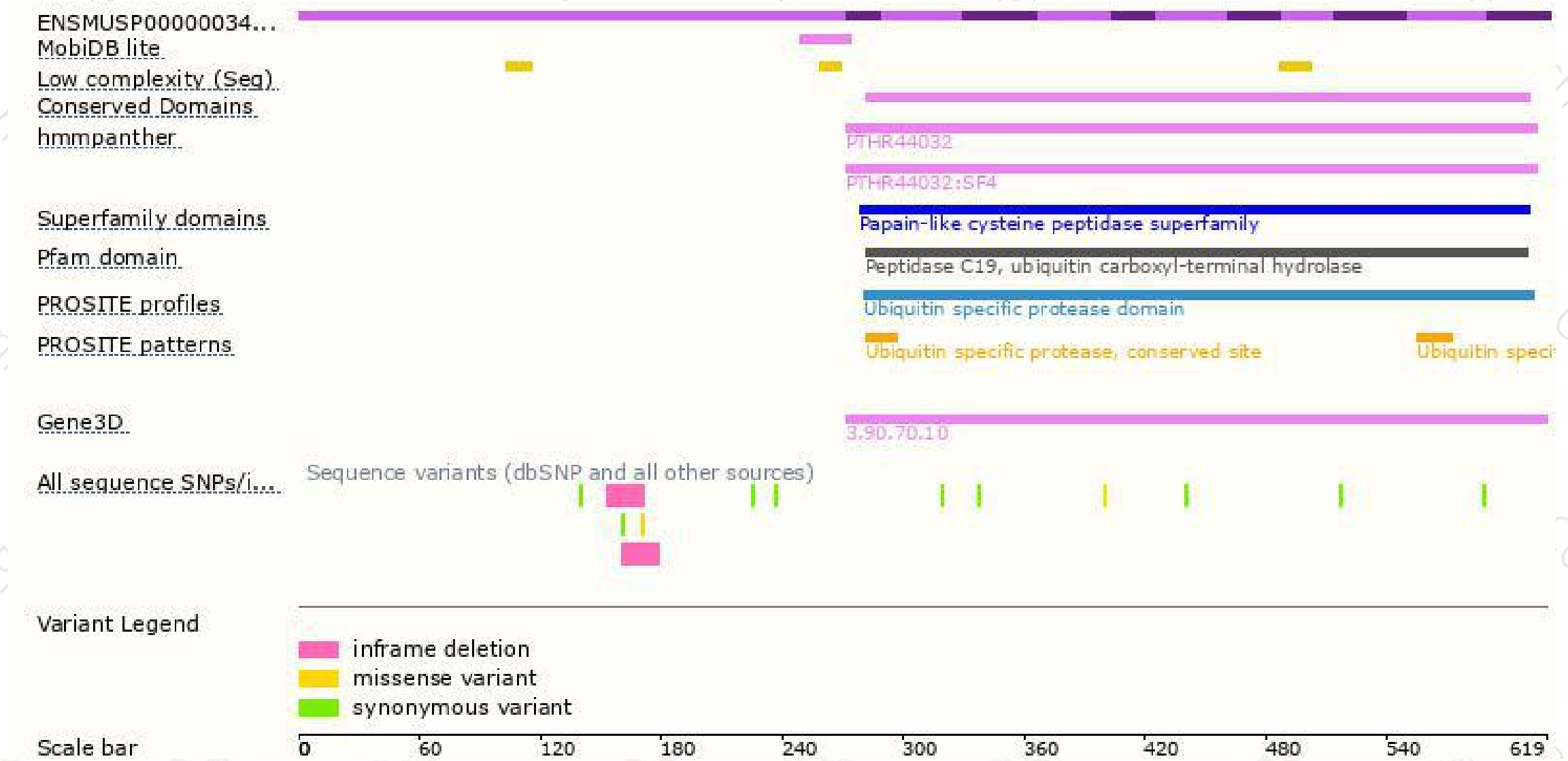
The strategy is based on the design of *Usp2-201* transcript,The transcription is shown below



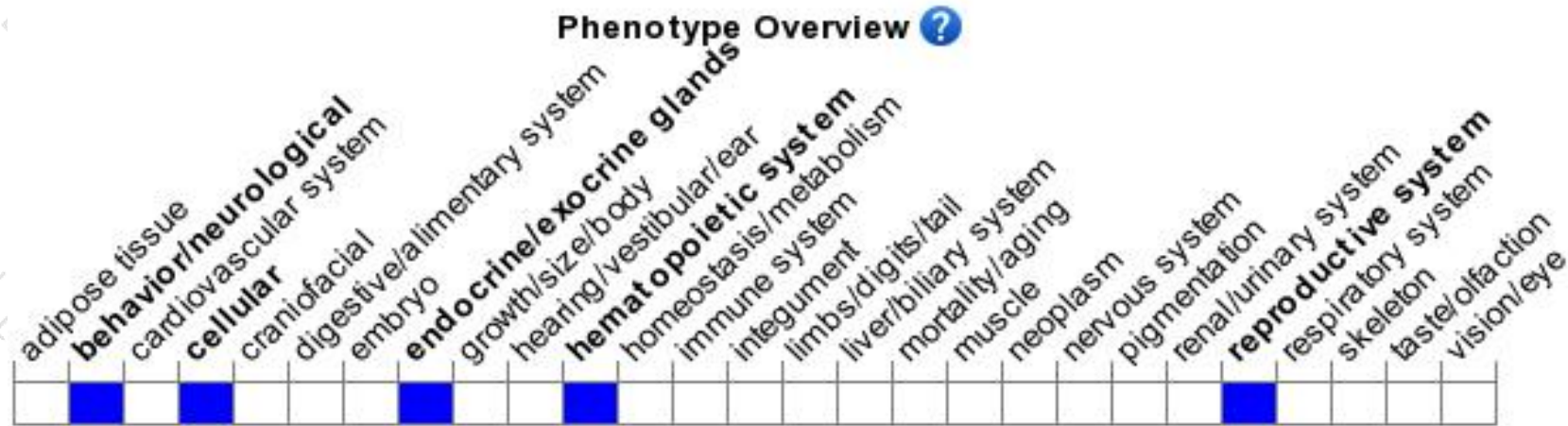
Genomic location distribution



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 a null mutation display severely reduced male fertility with defects in sperm motility.

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

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