Usp22 Cas9-CKO Strategy

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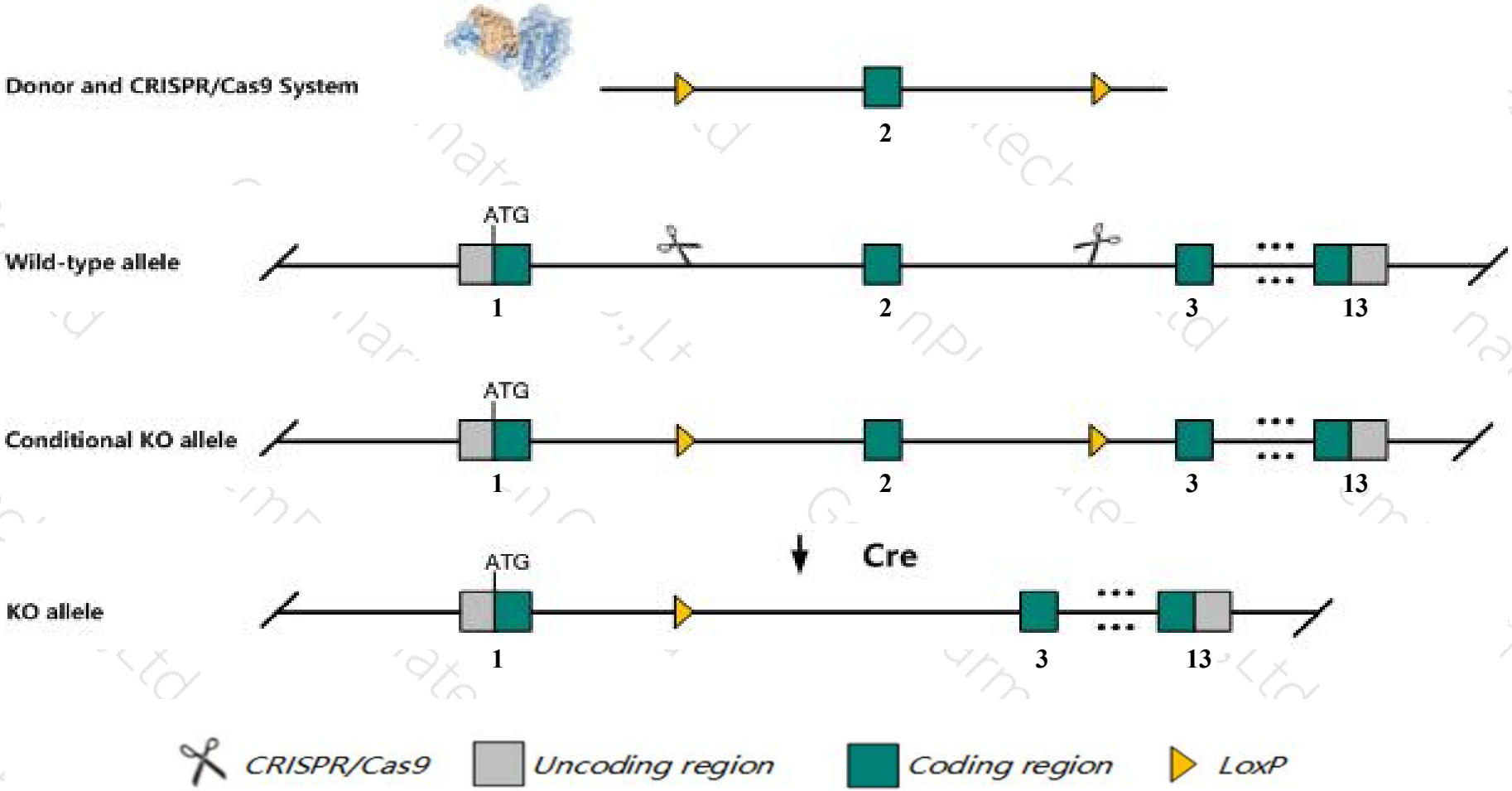
Project Overview

Project Name	***Usp22***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Usp22* gene. The schematic diagram is as follows:



Technical routes

- The *Usp22* gene has 5 transcripts. According to the structure of *Usp22* gene, exon2 of *Usp22-201* (ENSMUST00000041683.8) transcript is recommended as the knockout region.The region contains 133bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Usp22* 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,Mice homozygous for a null allele exhibit embryonic lethality, embryonic growth retardation, and increased apoptosis in mouse embryonic fibroblasts. Homozygotes for a hypomorphic allele are viable but show postnatal growth retardation, and impaired cell differentiation in the small intestine and brain.

- The *Usp22* gene is located on the Chr11. 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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Usp22 ubiquitin specific peptidase 22 [Mus musculus (house mouse)]

Gene ID: 216825, updated on 2-Apr-2019

Summary

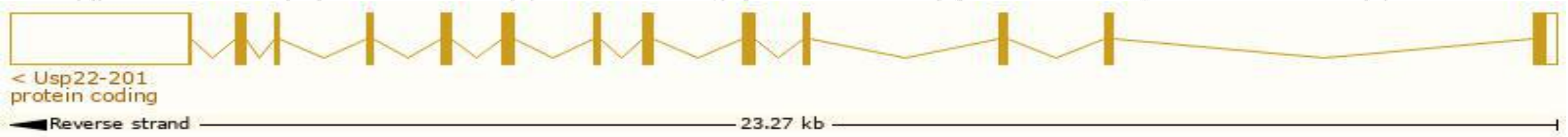
Official Symbol	Usp22 provided by MGI
Official Full Name	ubiquitin specific peptidase 22 provided by MGI
Primary source	MGI:MGI:2144157
See related	Ensembl:ENSMUSG00000042506
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	AI427806
Expression	Broad expression in CNS E18 (RPKM 112.1), whole brain E14.5 (RPKM 101.1) and 27 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

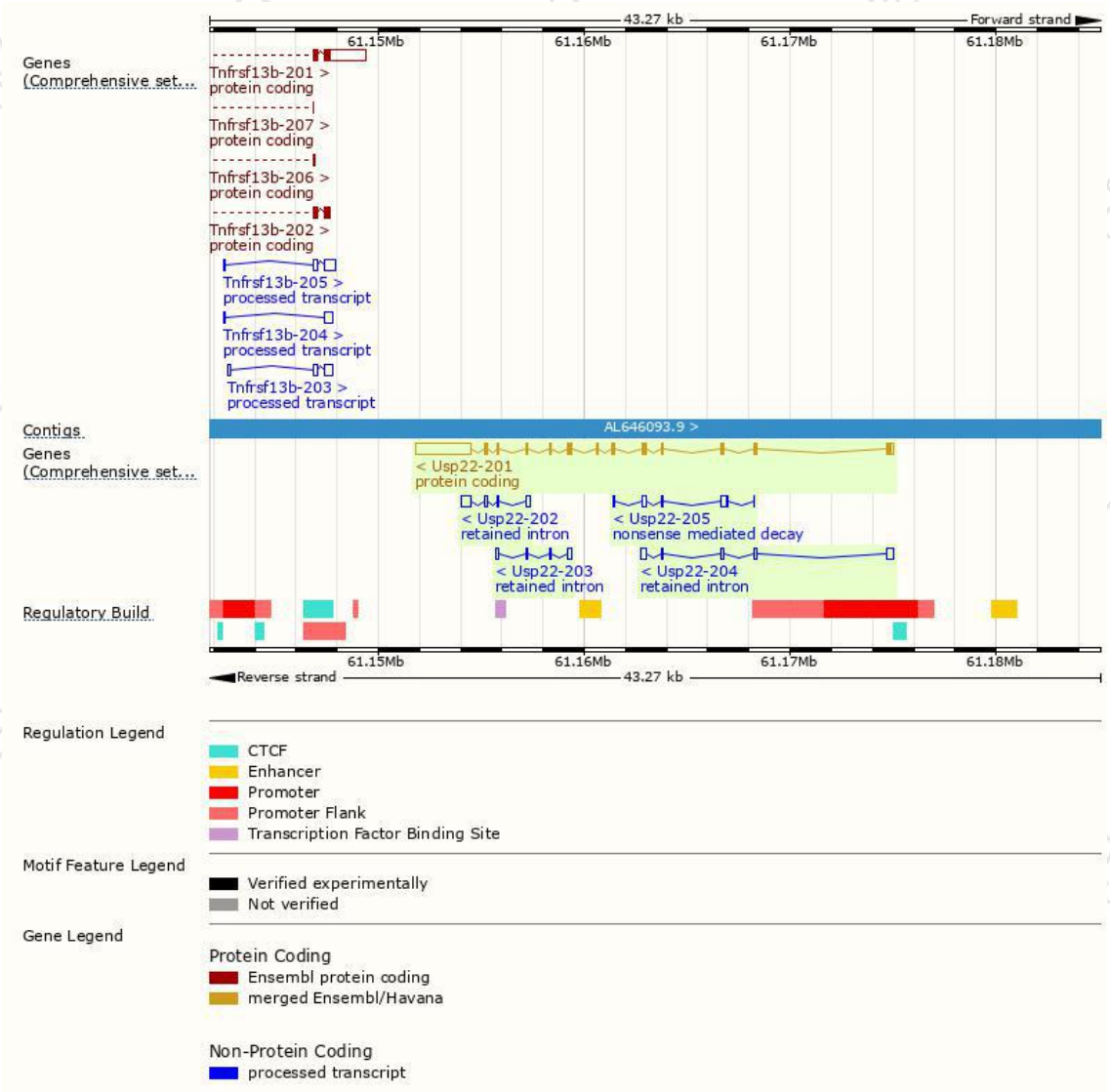
The gene has 5 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Usp22-201	ENSMUST00000041683.8	4434	525aa	Protein coding	CCDS24807	Q5DU02	TSL:1 GENCODE basic APPRIS P1
Usp22-205	ENSMUST00000174301.7	657	21aa	Nonsense mediated decay	-	H3BLQ1	CDS 5' incomplete TSL:5
Usp22-202	ENSMUST00000173525.1	930	No protein	Retained intron	-	-	TSL:3
Usp22-204	ENSMUST00000174220.1	889	No protein	Retained intron	-	-	TSL:1
Usp22-203	ENSMUST00000174035.1	520	No protein	Retained intron	-	-	TSL:3

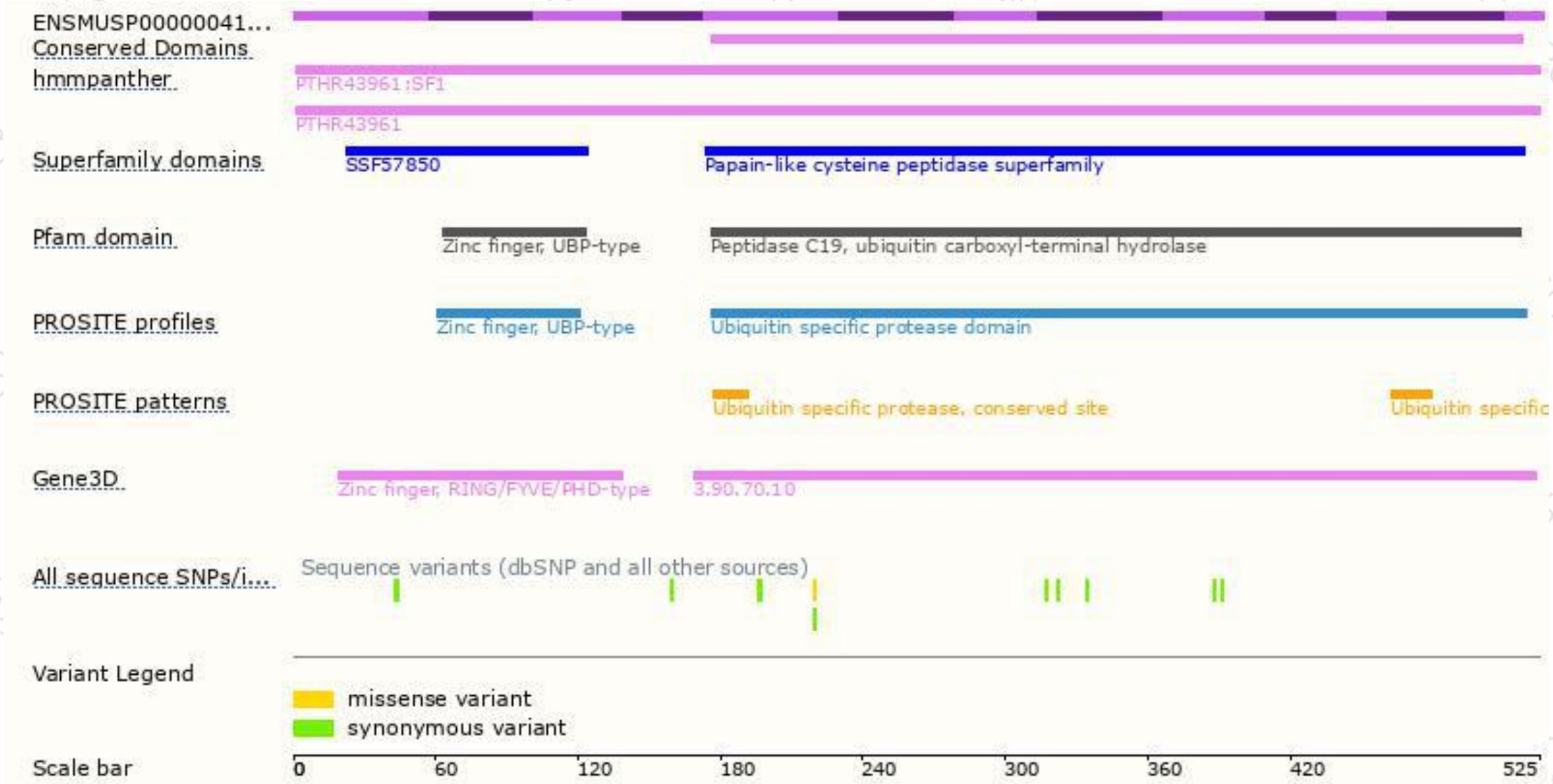
The strategy is based on the design of *Usp22-201* transcript,The transcription is shown below



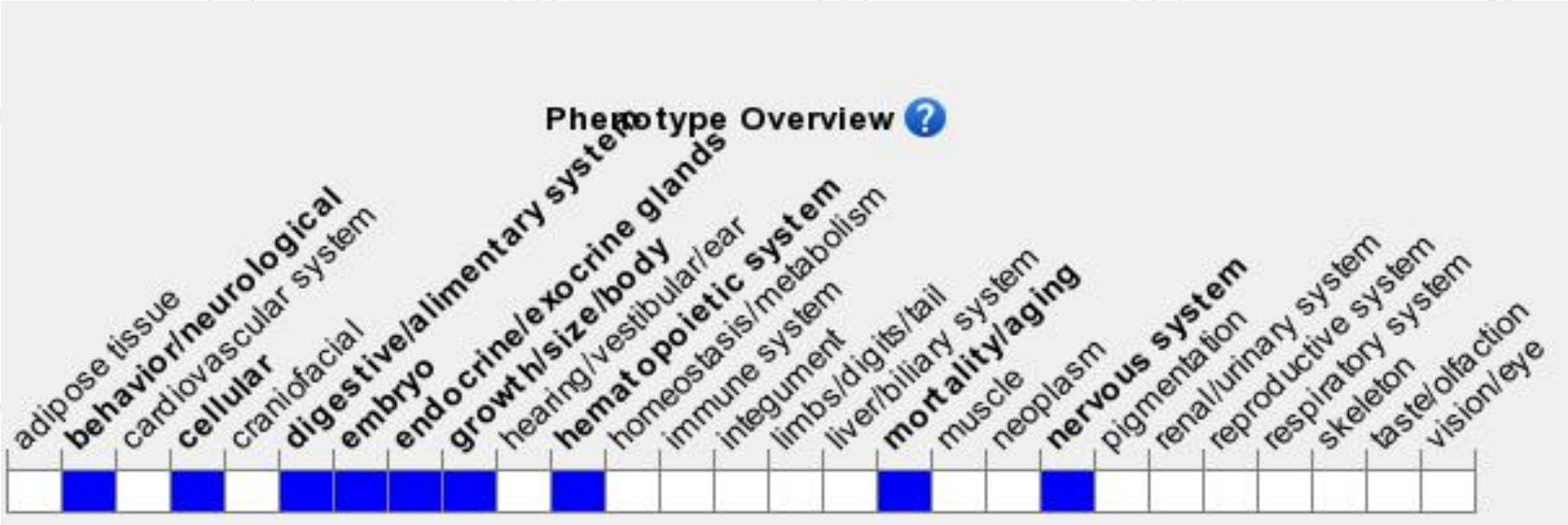
Genomic location distribution



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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