Prdx1 Cas9-CKO Strategy

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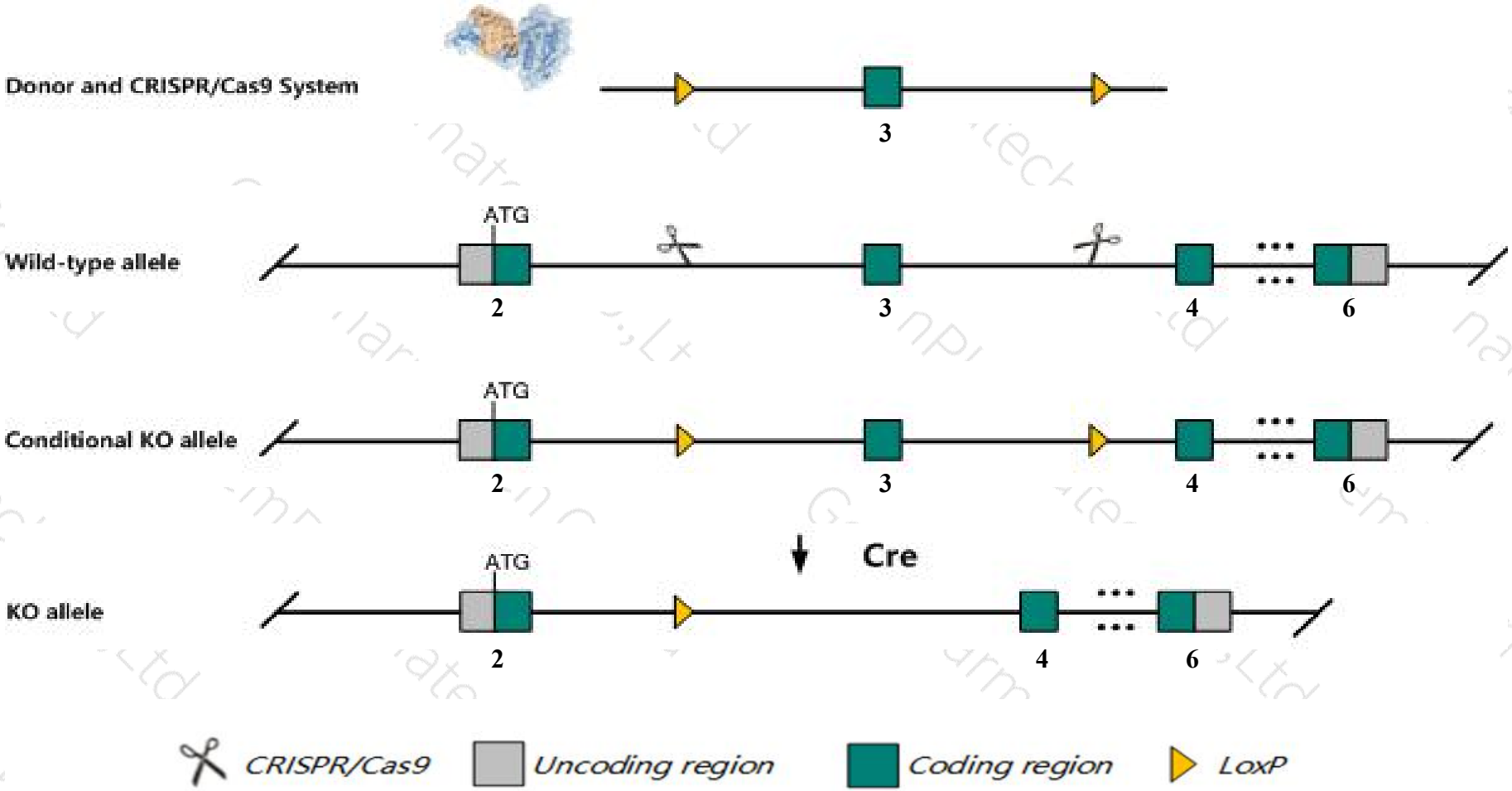
Project Overview

Project Name	***Prdx1***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Prdx1* gene. The schematic diagram is as follows:



Technical routes

- The *Prdx1* gene has 6 transcripts. According to the structure of *Prdx1* gene, exon3 of *Prdx1-204* (ENSMUST00000135573.7) transcript is recommended as the knockout region.The region contains 154bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Prdx1* 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,Mutant mice exhibit defects in antioxidant defense that manifest as hemolytic anemia and malignancies. The phenotype is more severe in homozygous mutant mice which die prematurely.

- The *Prdx1* gene is located on the Chr4. 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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Prdx1 peroxiredoxin 1 [Mus musculus (house mouse)]

Gene ID: 18477, updated on 7-Apr-2019

Summary

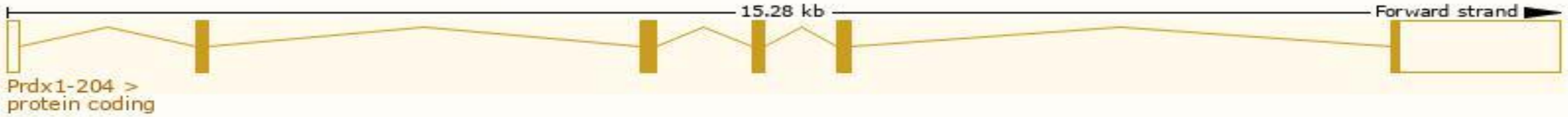
Official Symbol	Prdx1 provided by MGI
Official Full Name	peroxiredoxin 1 provided byMGI
Primary source	MGI:MGI:99523
See related	Ensembl:ENSMUSG00000028691
Gene type	protein coding
RefSeq status	PROVISIONAL
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	MSP23, NkefA, OSF-3, OSF3, PAG, Paga, Prdxl, Prxl, TDX2, TPxA, Tdpx2, prx1
Expression	Ubiquitous expression in liver E18 (RPKM 260.9), placenta adult (RPKM 195.3) and 27 other tissuesSee more
Orthologs	human all

Transcript information（Ensembl）

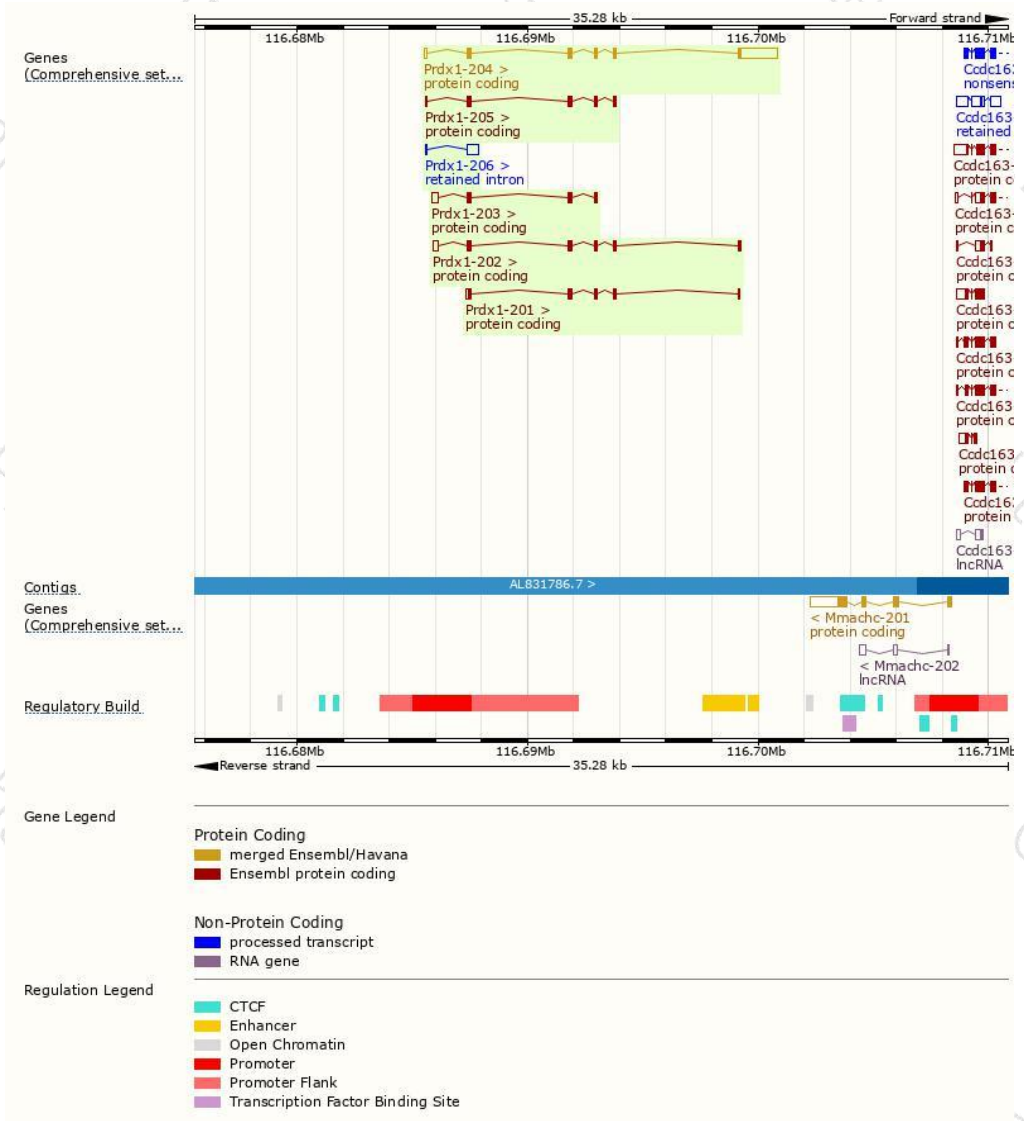
The gene has 6 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Prdx1-204	ENSMUST00000135573.7	2294	199aa	Protein coding	CCDS18515	P35700	TSL:1 GENCODE basic APPRIS P1
Prdx1-202	ENSMUST00000106470.7	877	199aa	Protein coding	CCDS18515	P35700	TSL:5 GENCODE basic APPRIS P1
Prdx1-203	ENSMUST00000129315.7	661	123aa	Protein coding	-	B1AXW4	CDS 3' incomplete TSL:3
Prdx1-201	ENSMUST00000030454.5	636	176aa	Protein coding	-	B1AXW6	CDS 3' incomplete TSL:2
Prdx1-205	ENSMUST00000151129.7	611	169aa	Protein coding	-	B1AXW5	CDS 3' incomplete TSL:3
Prdx1-206	ENSMUST00000156145.6	553	No protein	Retained intron	-	-	TSL:2

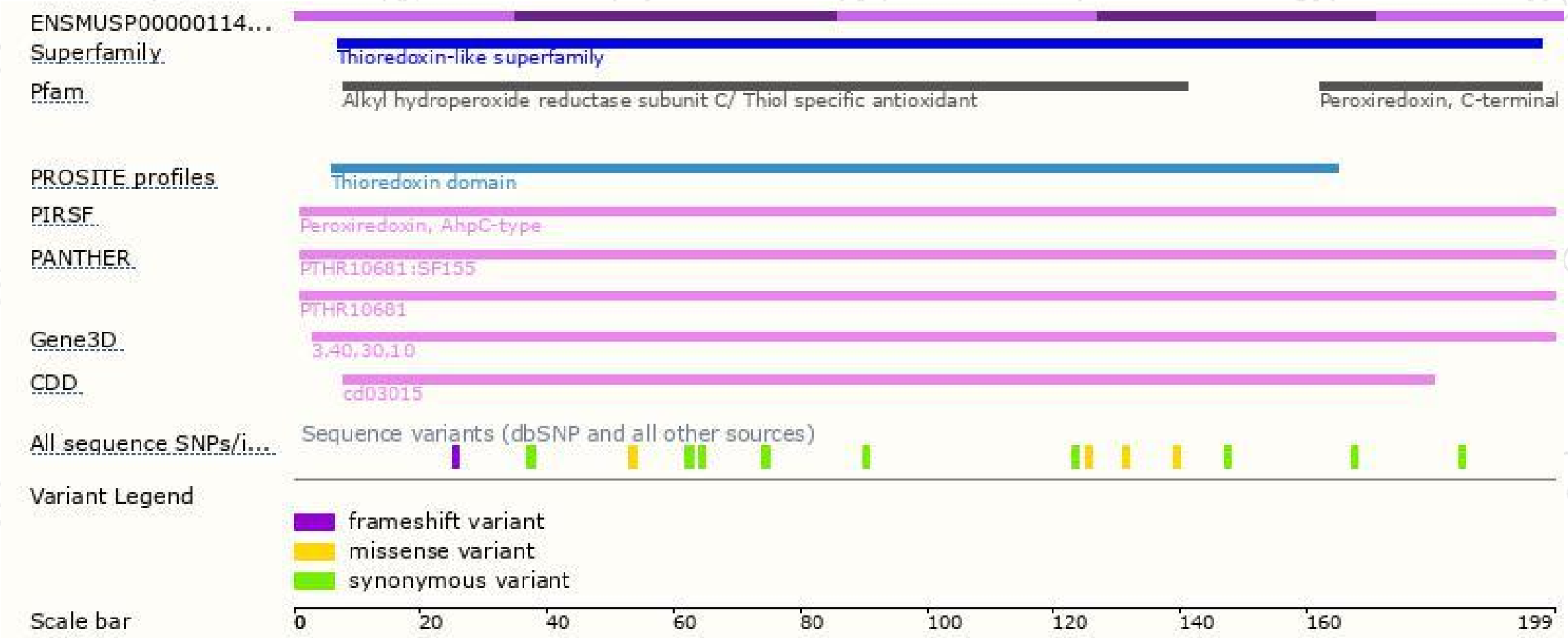
The strategy is based on the design of *Prdx1-204* transcript,The transcription is shown below



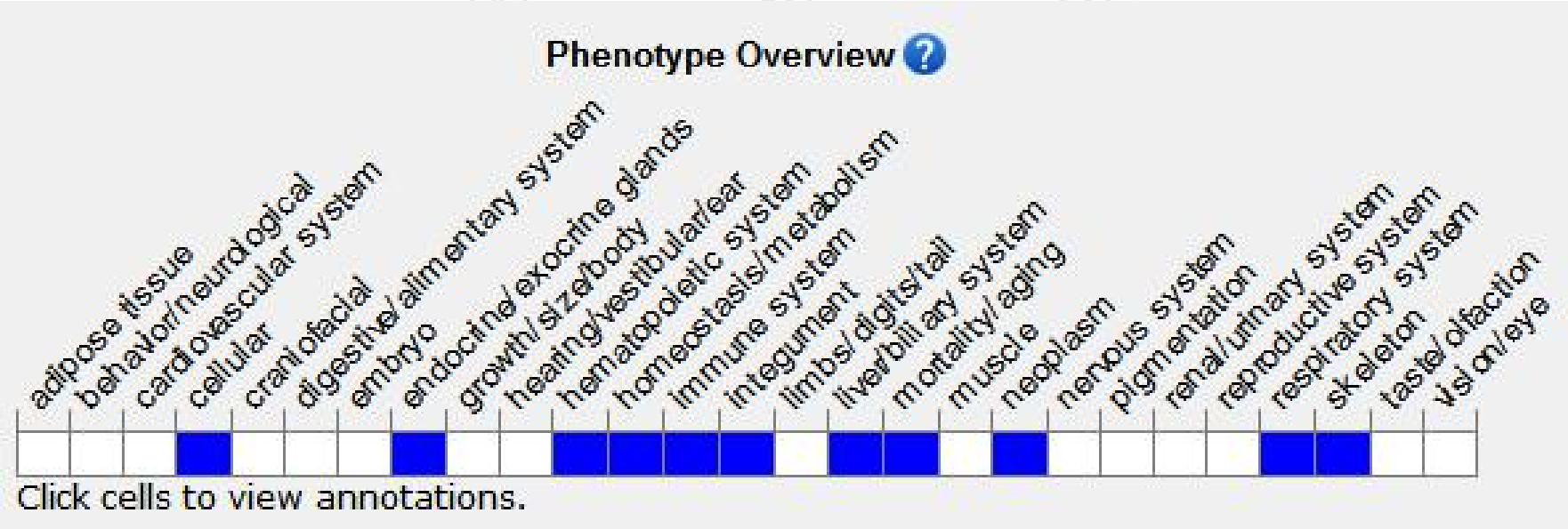
Genomic location distribution



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,Mutant mice exhibit defects in antioxidant defense that manifest as hemolytic anemia and malignancies. The phenotype is more severe in homozygous mutant mice which die prematurely.

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

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