Prdx2 Cas9-CKO Strategy

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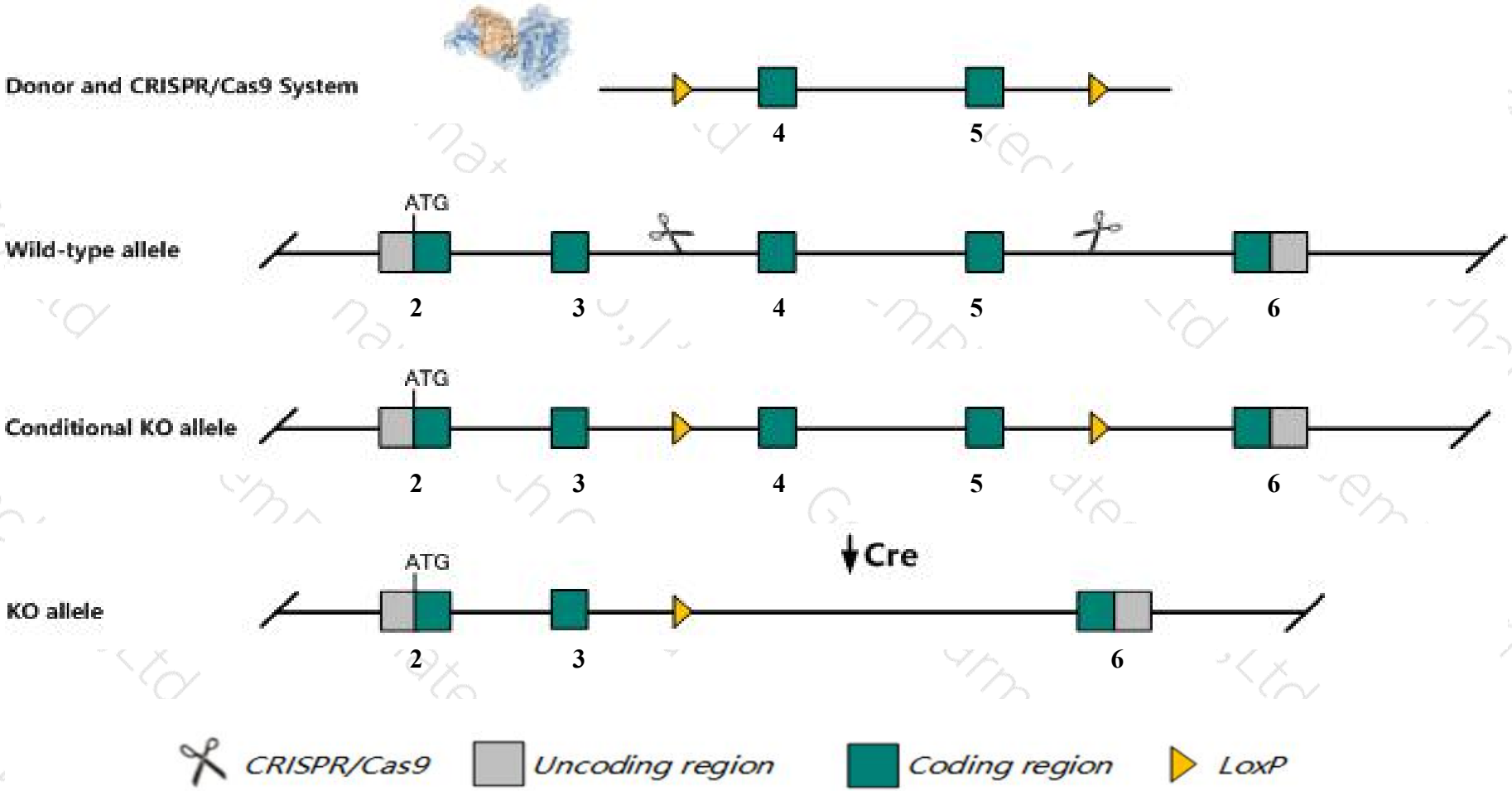
Project Overview

Project Name	***Prdx2***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Prdx2* gene. The schematic diagram is as follows:



Technical routes

➢ The *Prdx2* gene has 8 transcripts. According to the structure of *Prdx2* gene, exon4-exon5 of *Prdx2-203*(ENSMUST00000109734.7) transcript is recommended as the knockout region.The region contains 254bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Prdx2* 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 null mice have hemolytic anemia and exhibit enlarged spleens due to congestion of the red pulp.

➢ The floxed region is about 1.4 kb from the N-terminus of Rnaseh2a gene and Gm49661 gene, which may affect the regulation of the N-terminus of Rnaseh2a gene and Gm49661 gene.

➢ Some amino acids will remain at the N-terminus and some functions may be retained.

➢ The *Prdx2* gene is located on the Chr8. 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）

Prdx2 peroxiredoxin 2 [Mus musculus (house mouse)]

Gene ID: 21672, updated on 13-Mar-2020

Summary

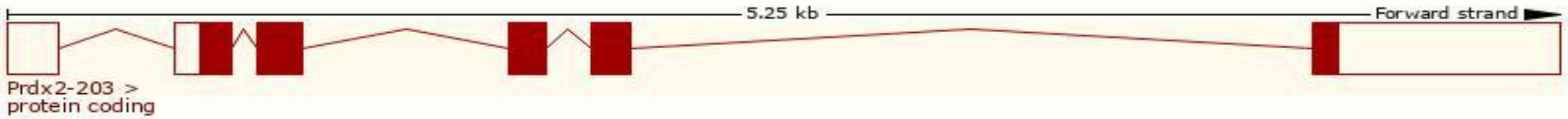
Official Symbol	Prdx2 provided by MGI
Official Full Name	peroxiredoxin 2 provided byMGI
Primary source	MGI:MGI:109486
See related	Ensembl:ENSMUSG00000005161
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	AL022839, Band-8, NkefB, PRP, PrxII, TDX1, TPx, TPx-B, TR, TSA, Tdpx1, Torin
Expression	Broad expression in liver E14 (RPKM 507.8), liver E14.5 (RPKM 504.3) and 27 other tissuesSee more
Orthologs	human all

Transcript information（Ensembl）

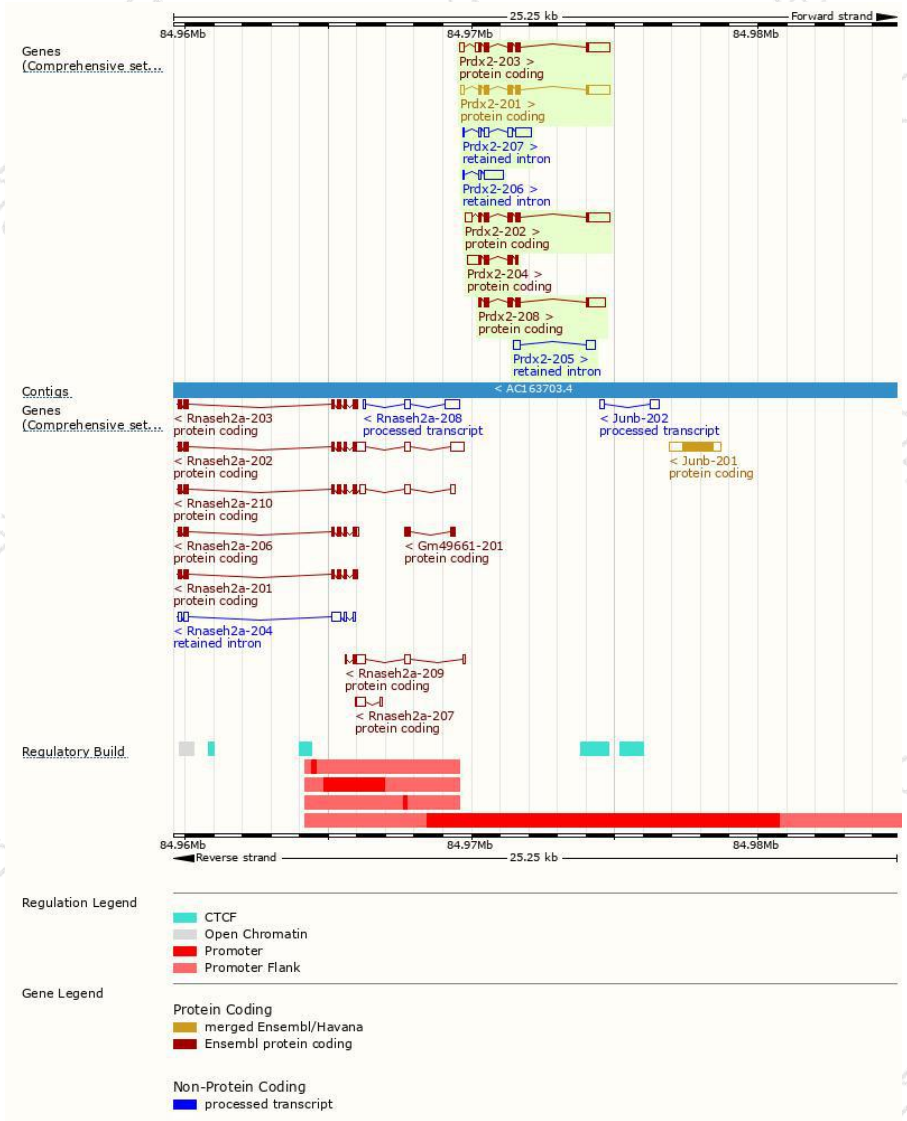
The gene has 8 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Prdx2-203	ENSMUST00000109734.7	1612	198aa	Protein coding	CCDS40416	Q61171	TSL:2 GENCODE basic APPRIS P1
Prdx2-202	ENSMUST00000109733.7	1590	198aa	Protein coding	CCDS40416	Q61171	TSL:2 GENCODE basic APPRIS P1
Prdx2-201	ENSMUST00000005292.14	1500	198aa	Protein coding	CCDS40416	Q61171	TSL:1 GENCODE basic APPRIS P1
Prdx2-208	ENSMUST00000164807.1	1175	198aa	Protein coding	CCDS40416	Q61171	TSL:1 GENCODE basic APPRIS P1
Prdx2-204	ENSMUST00000125893.7	825	146aa	Protein coding	-	D3Z4A4	CDS 3' incomplete TSL:1
Prdx2-207	ENSMUST00000143402.2	993	No protein	Retained intron	-	-	TSL:2
Prdx2-206	ENSMUST00000138748.6	864	No protein	Retained intron	-	-	TSL:2
Prdx2-205	ENSMUST00000127215.1	549	No protein	Retained intron	-	-	TSL:2

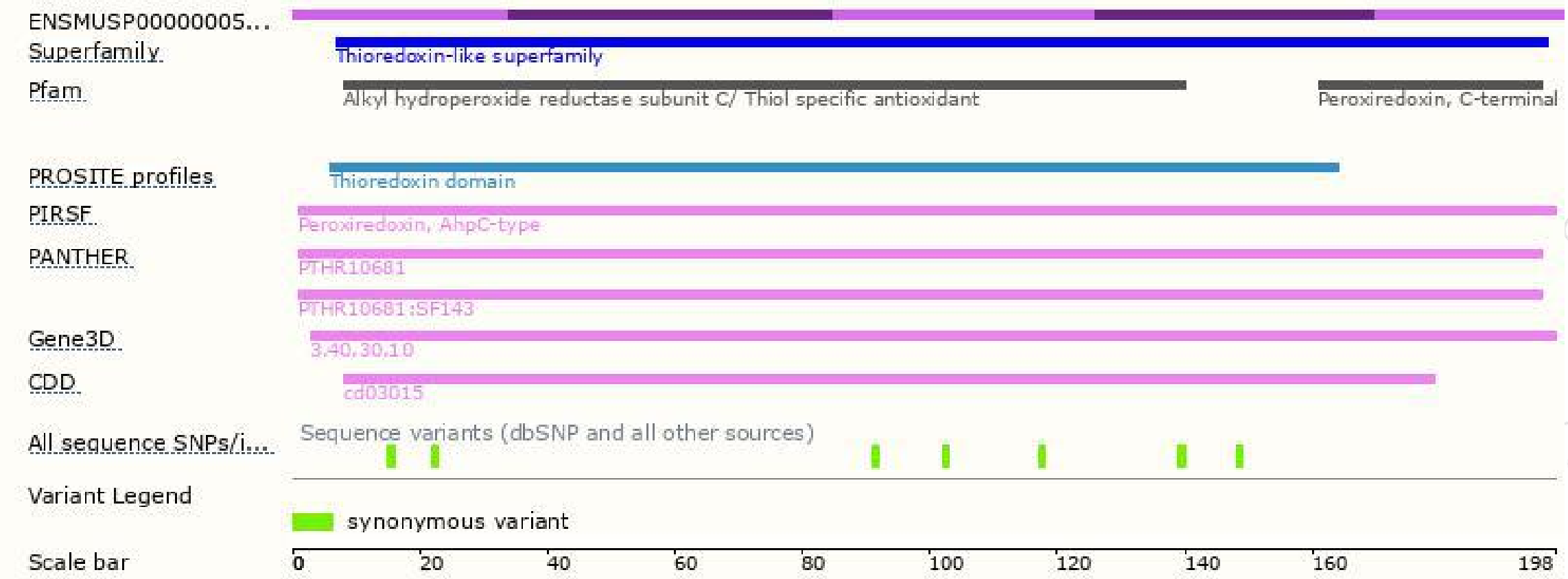
The strategy is based on the design of *Prdx2-203* transcript,the transcription is shown below:



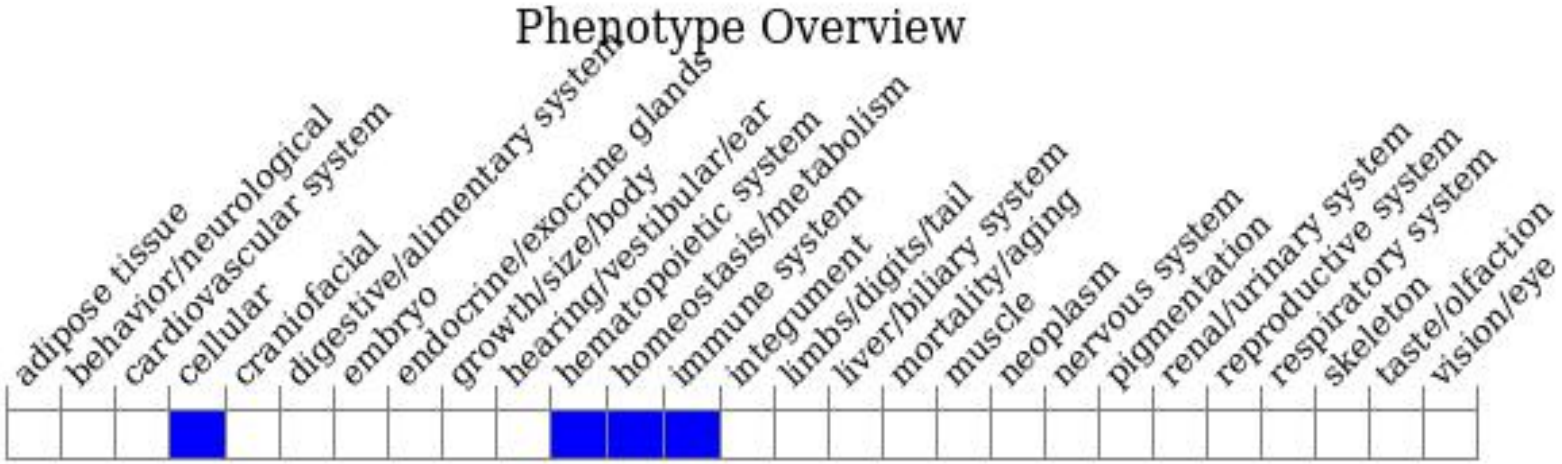
Genomic location distribution



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,homozygous null mice have hemolytic anemia and exhibit enlarged spleens due to congestion of the red pulp.

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

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