Spns2 Cas9-CKO Strategy

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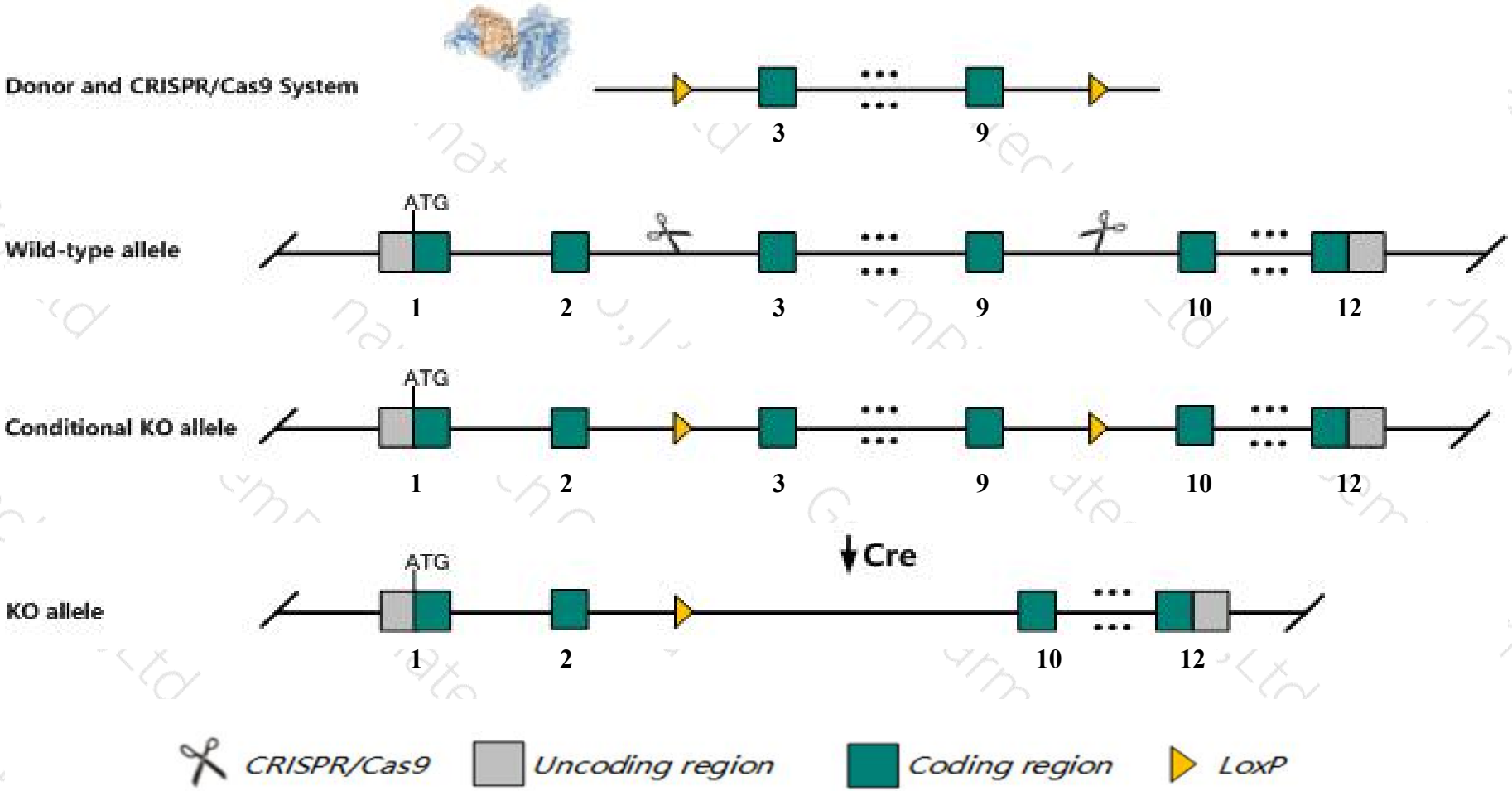
Design Date: 2020-3-6

Project Overview

Project Name	***Spns2***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Spns2* gene. The schematic diagram is as follows:



Technical routes

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- The *Spns2* gene has 6 transcripts. According to the structure of *Spns2* gene, exon3-exon9 of *Spns2-201* (ENSMUST00000045303.9) transcript is recommended as the knockout region.The region contains 908bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Spns2* 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 knock-out allele exhibit symblepharon and impaired egress of T and B cells from the thymus and bone marrow, respectively. Mice homozygous for a different knock-out allele exhibit abnormal immune system, abnormal eye morphology and absent pinna reflex.

➢ The *Spns2* 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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Spns2 spinster homolog 2 [Mus musculus (house mouse)]

Gene ID: 216892, updated on 19-Mar-2019

Summary

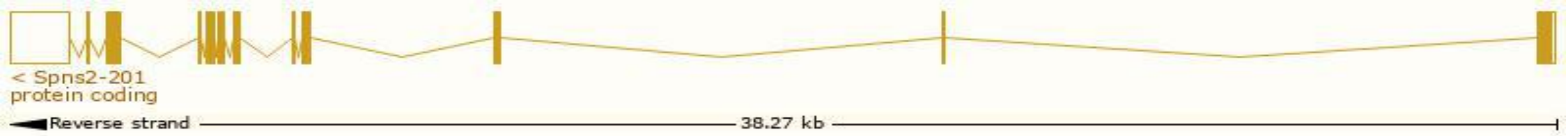
Official Symbol	Spns2 provided by MGI
Official Full Name	spinster homolog 2 provided by MGI
Primary source	MGI:MGI:2384936
See related	Ensembl:ENSMUSG00000040447
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Expression	Ubiquitous expression in lung adult (RPKM 39.6), kidney adult (RPKM 31.5) and 28 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

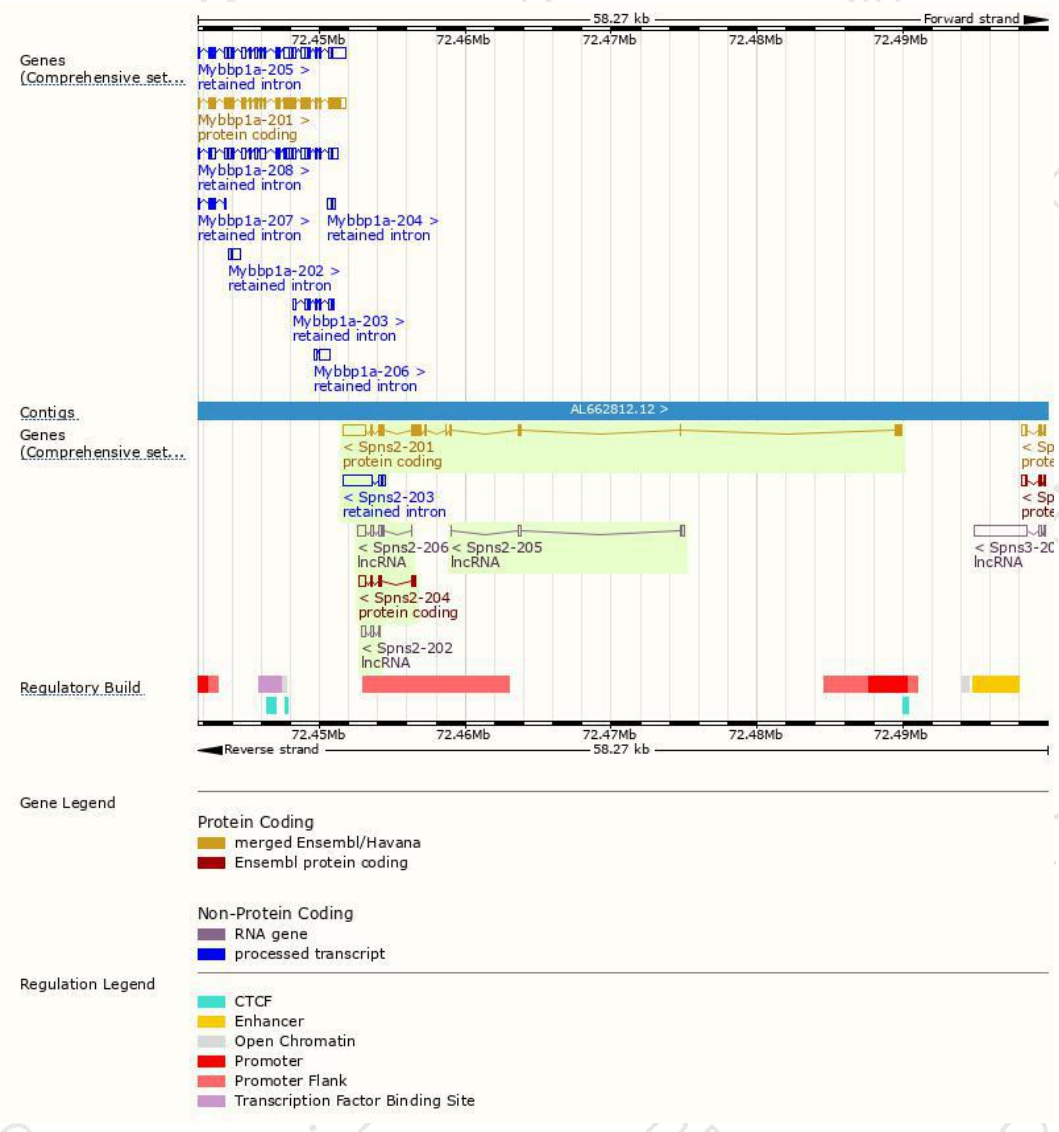
The gene has 6 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Spns2-201	ENSMUST00000045303.9	3241	549aa	Protein coding	CCDS48841	Q91VM4	TSL:1 GENCODE basic APPRIS P1
Spns2-204	ENSMUST00000144940.1	783	131aa	Protein coding	-	F6WK70	CDS 5' incomplete TSL:3
Spns2-203	ENSMUST00000129274.7	2365	No protein	Retained intron	-	-	TSL:1
Spns2-206	ENSMUST00000150491.1	980	No protein	lncRNA	-	-	TSL:5
Spns2-202	ENSMUST00000126452.1	489	No protein	lncRNA	-	-	TSL:5
Spns2-205	ENSMUST00000147418.1	375	No protein	lncRNA	-	-	TSL:3

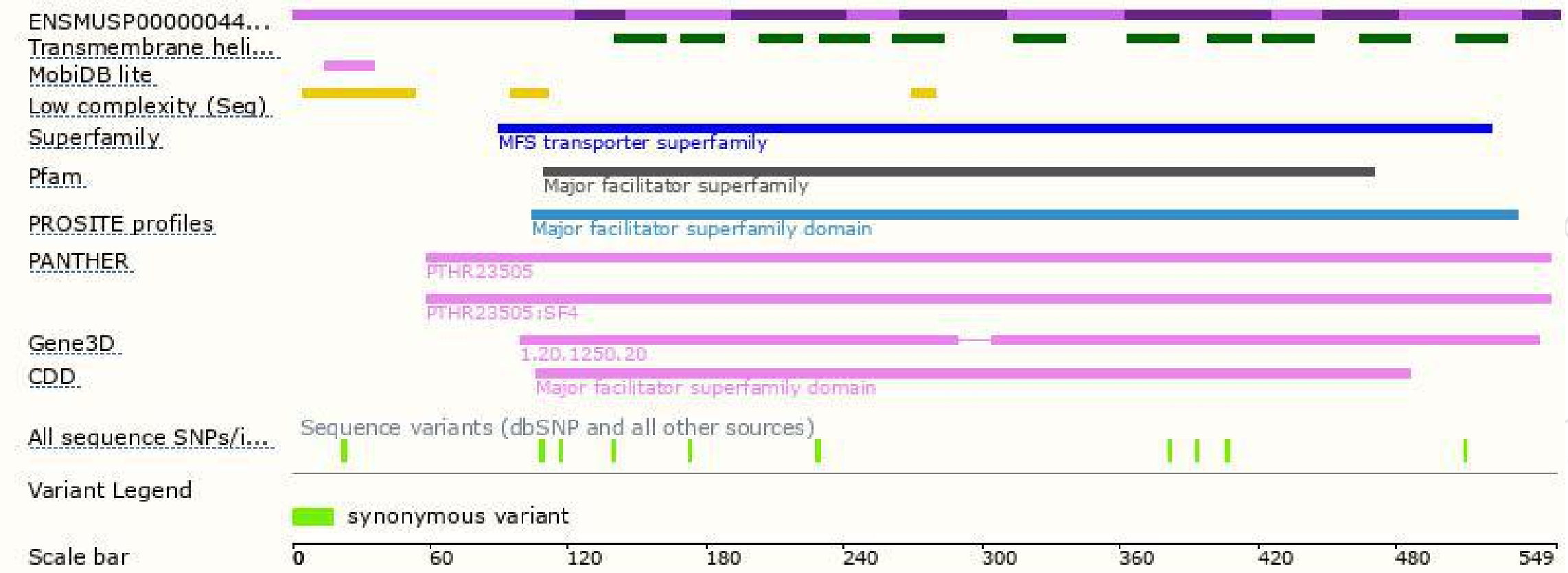
The strategy is based on the design of *Spns2-201* transcript,The transcription is shown below



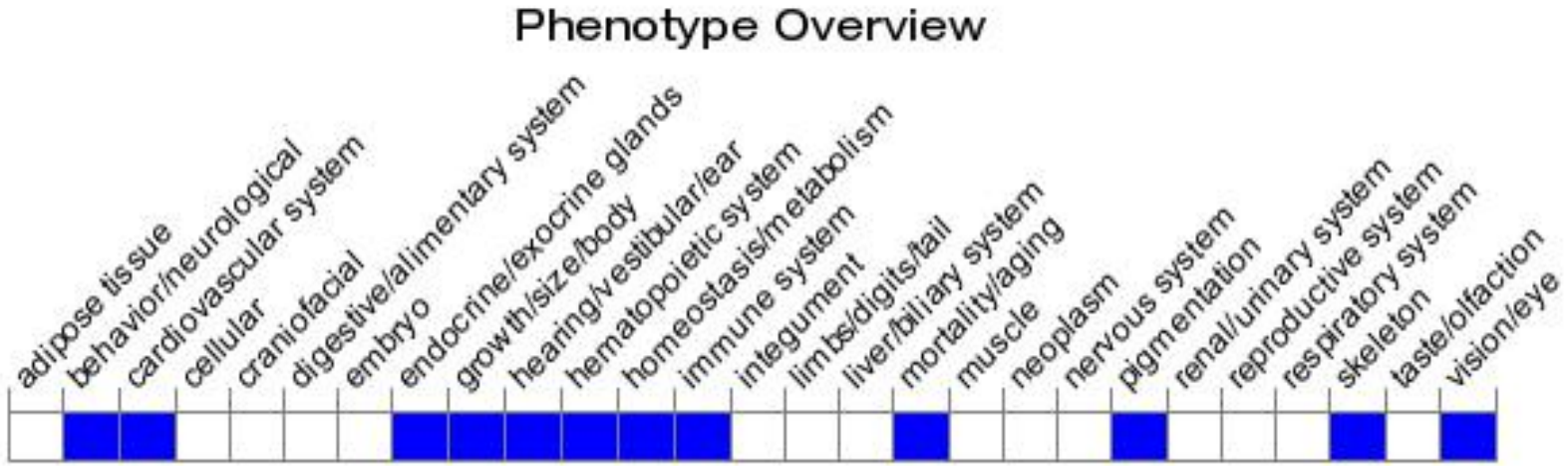
Genomic location distribution



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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