

Sh2d3c Cas9-CKO Strategy

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Project Overview

Project Name

Sh2d3c

Project type

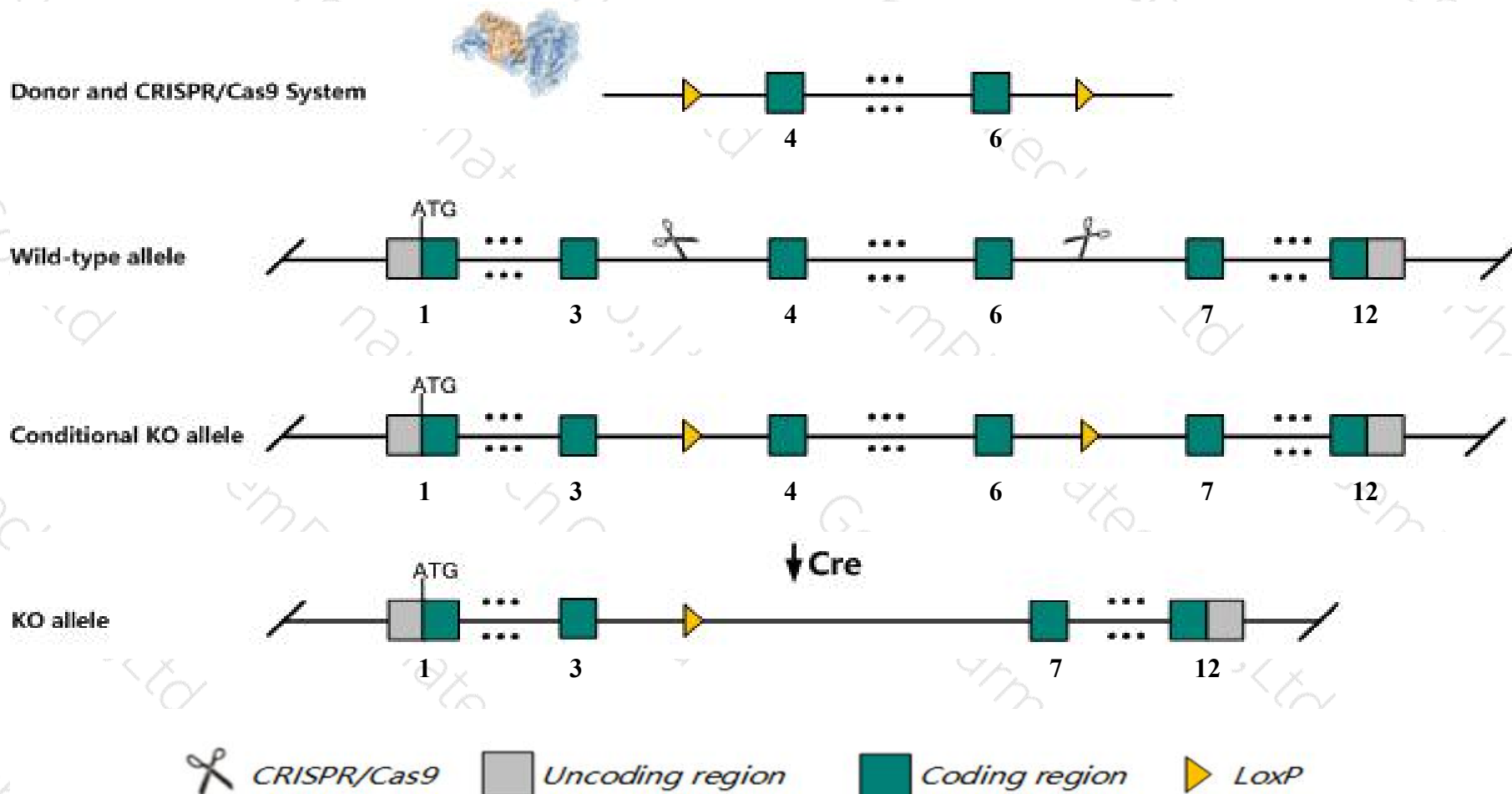
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Sh2d3c* gene. The schematic diagram is as follows:



Technical routes

- The *Sh2d3c* gene has 6 transcripts. According to the structure of *Sh2d3c* gene, exon4-exon6 of *Sh2d3c-201*(ENSMUST00000074248.10) transcript is recommended as the knockout region. The region contains 709bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Sh2d3c* 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.

- According to the existing MGI data, mice homozygous for a knock-out allele exhibit neonatal lethality with absence of gastric milk. Surviving mice exhibit abnormal olfactory bulb innervation, fewer gonadotrophin positive cells in the hypothalamus, and decreased testes size.
- Some amino acids will remain at the N-terminus and some functions may be retained.
- The flox region is about 3 kb away from the 5th end of the 6330409D20Rik gene, which may affect the regulation of this gene.
- The *Sh2d3c* gene is located on the Chr2. 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)

Sh2d3c SH2 domain containing 3C [Mus musculus (house mouse)]

Gene ID: 27387, updated on 13-Mar-2020

Summary



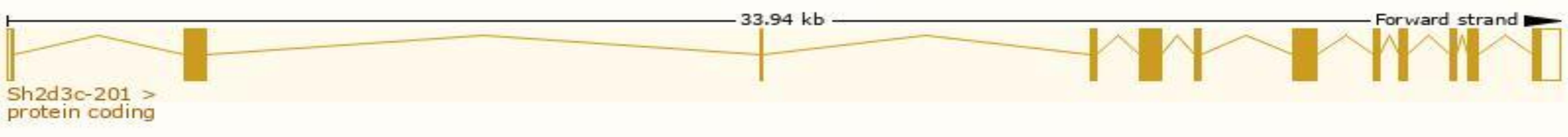
Official Symbol	Sh2d3c provided by MGI
Official Full Name	SH2 domain containing 3C provided by MGI
Primary source	MGI:MGI:1351631
See related	Ensembl:ENSMUSG00000059013
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Chat, Nsp3, Shep1
Expression	Broad expression in lung adult (RPKM 40.4), spleen adult (RPKM 34.7) and 24 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

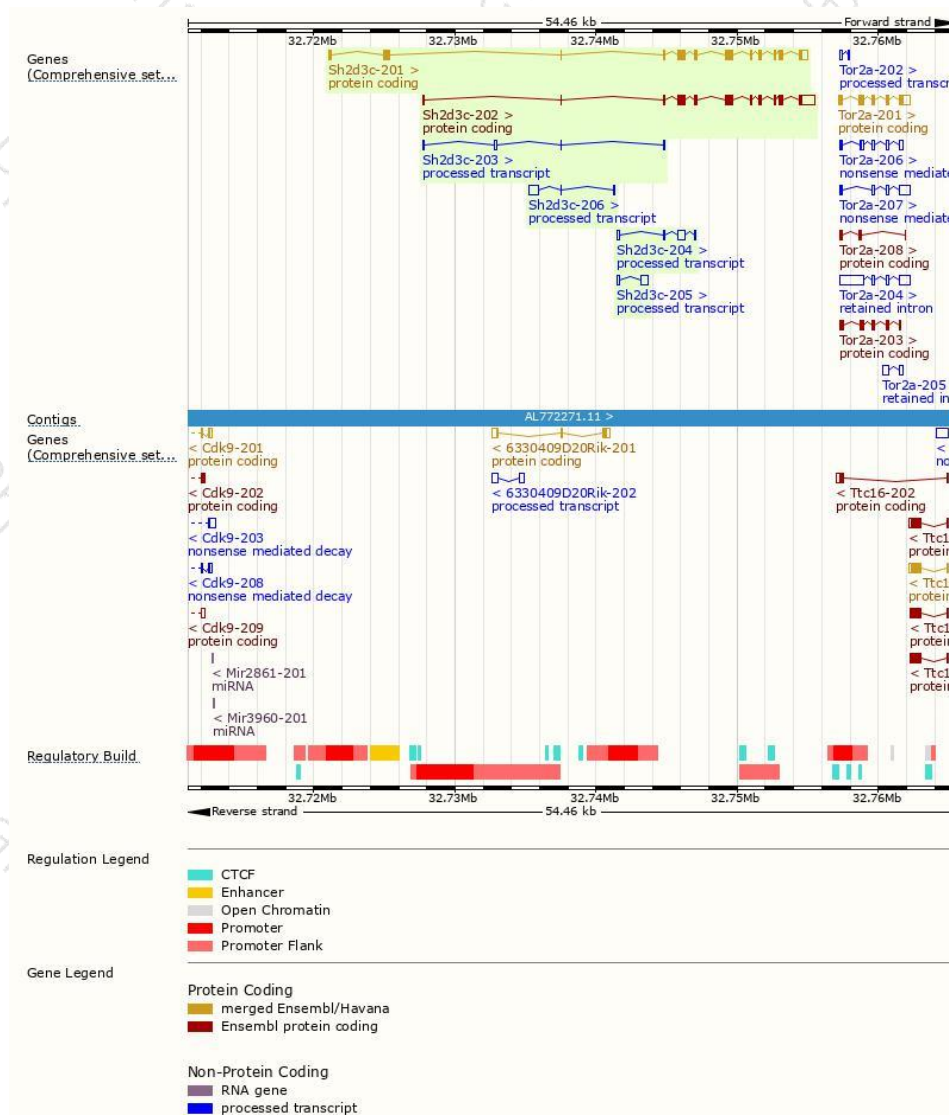
The gene has 6 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Sh2d3c-202	ENSMUST00000113242.4	3107	702aa	Protein coding	CCDS57168	Q9QZS8	TSL:1 GENCODE basic APPRIS P1
Sh2d3c-201	ENSMUST00000074248.10	3092	854aa	Protein coding	CCDS15928	Q9QZS8	TSL:1 GENCODE basic
Sh2d3c-204	ENSMUST00000131101.2	805	No protein	Processed transcript	-	-	TSL:5
Sh2d3c-206	ENSMUST00000141670.1	794	No protein	Processed transcript	-	-	TSL:3
Sh2d3c-205	ENSMUST00000139563.1	632	No protein	Processed transcript	-	-	TSL:3
Sh2d3c-203	ENSMUST00000124133.7	369	No protein	Processed transcript	-	-	TSL:3

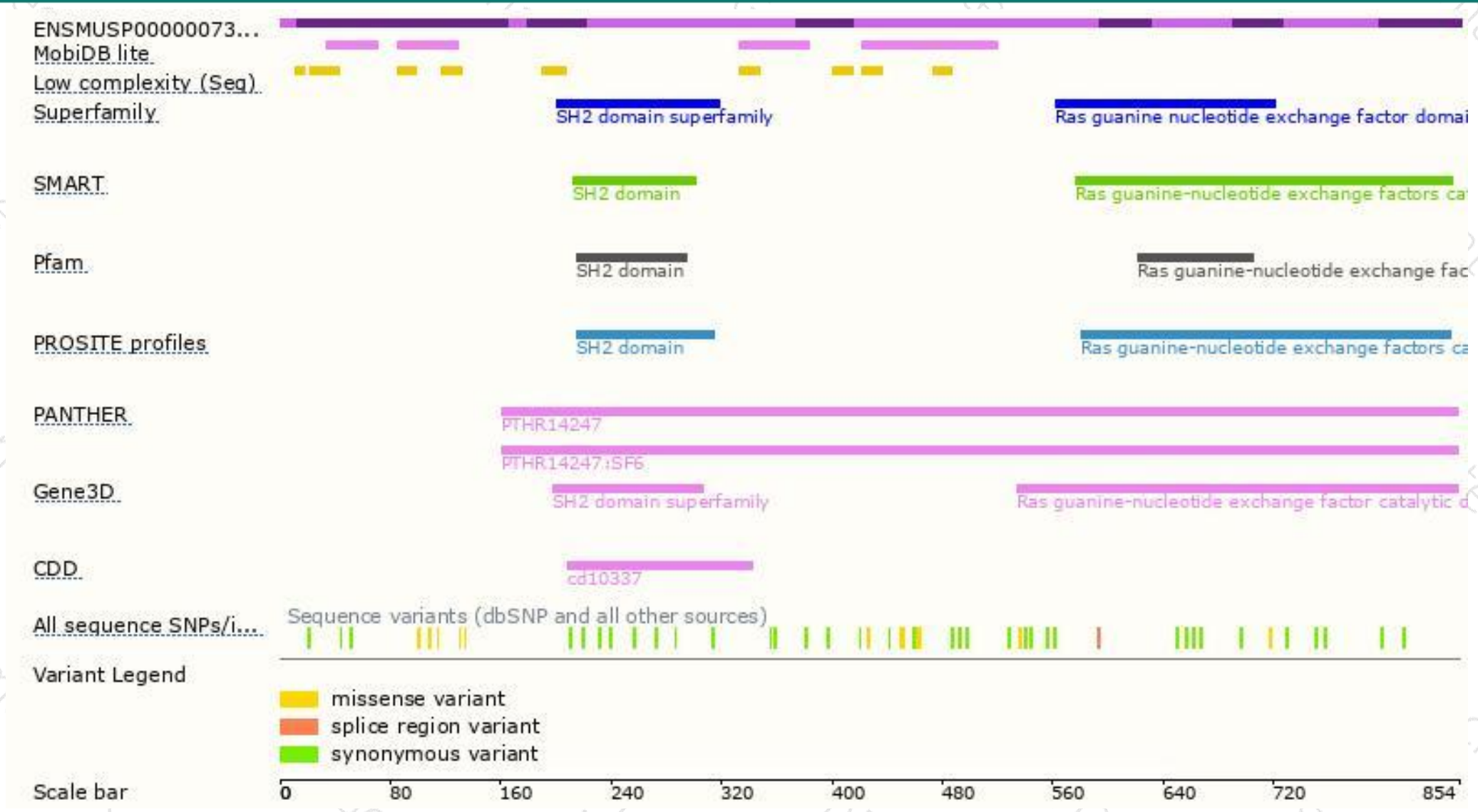
The strategy is based on the design of *Sh2d3c-201* transcript,the transcription is shown below:



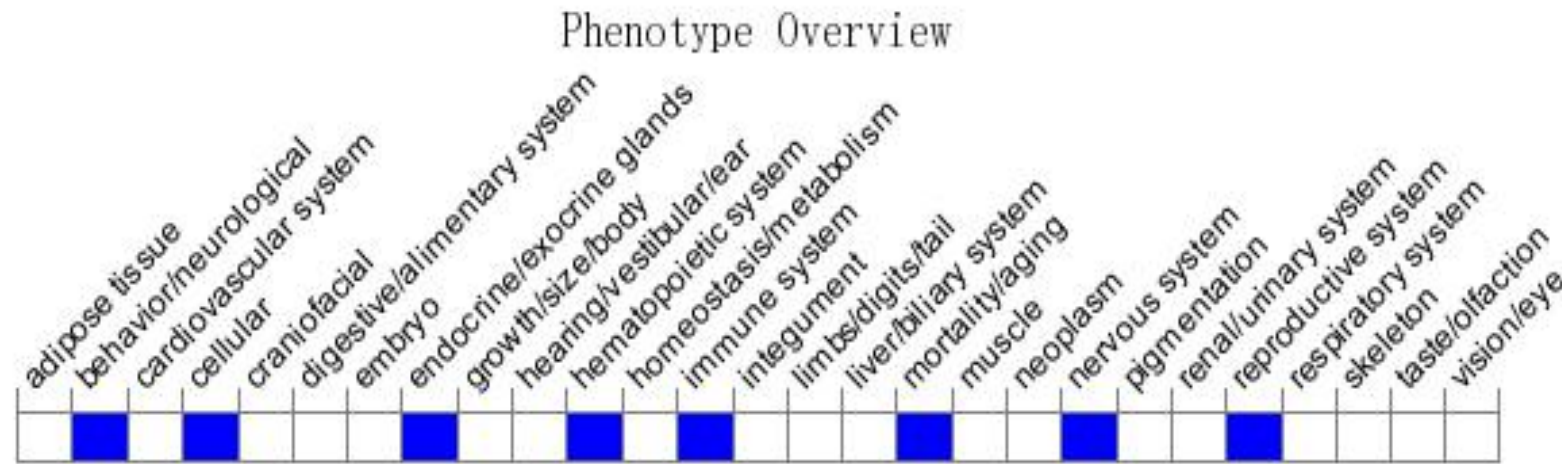
Genomic location distribution



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 knock-out allele exhibit neonatal lethality with absence of gastric milk. Surviving mice exhibit abnormal olfactory bulb innervation, fewer gonadotrophin positive cells in the hypothalamus, and decreased testes size.

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

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