Smyd4 Cas9-CKO Strategy

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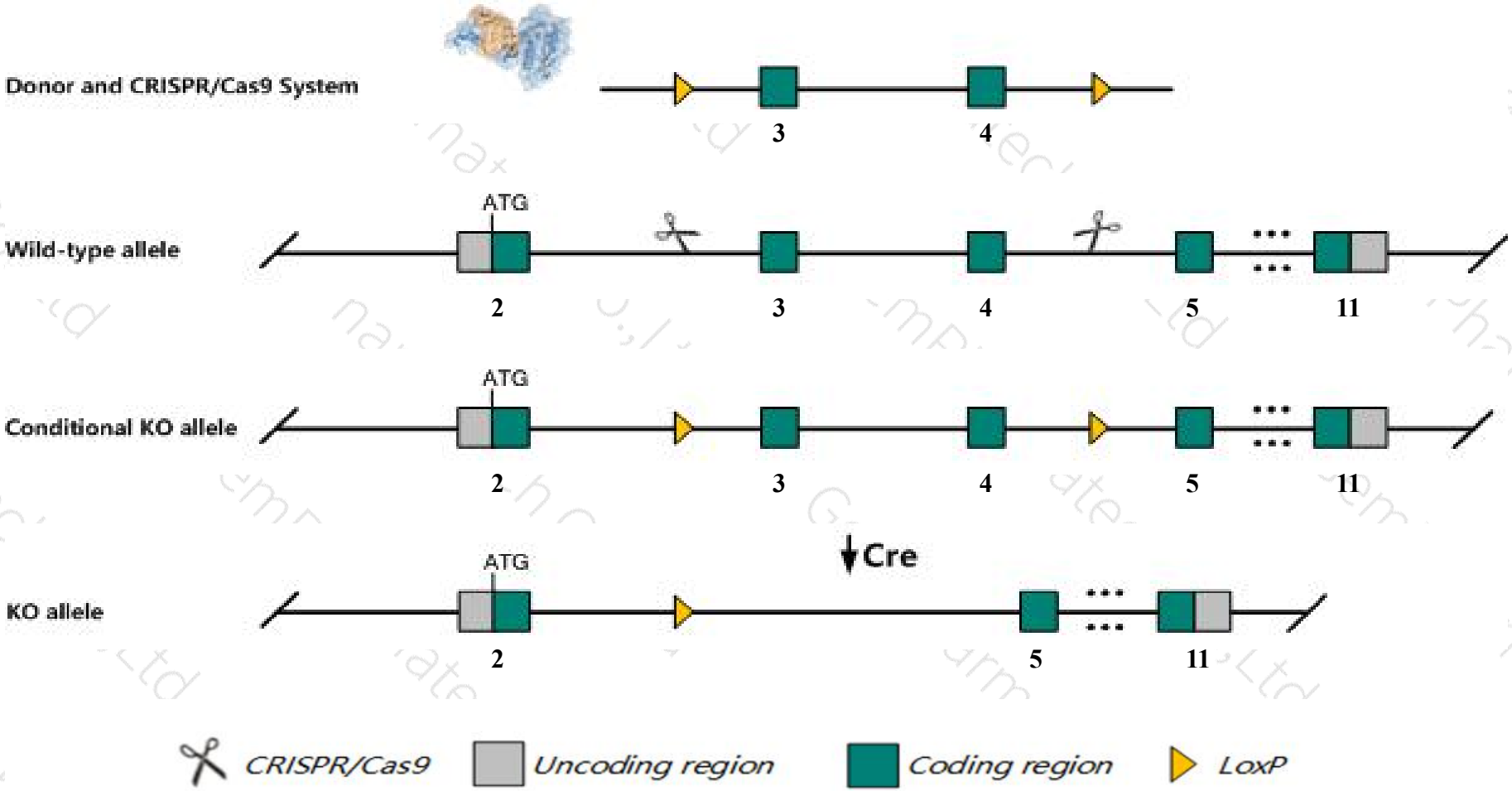
Project Overview

Project Name	***Smyd4***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Smyd4* gene. The schematic diagram is as follows:



Technical routes

- The *Smyd4* gene has 4 transcripts. According to the structure of *Smyd4* gene, exon3-exon4 of *Smyd4-201* (ENSMUST00000044530.2) transcript is recommended as the knockout region.The region contains 235bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Smyd4* 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 testicular degeneration and atrophy.
- Transcript *Smyd4*-202 may not be affected.
- The *Smyd4* 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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Smyd4 SET and MYND domain containing 4 [Mus musculus (house mouse)]

Gene ID: 319822, updated on 13-Mar-2020

Summary

Official Symbol	Smyd4 provided by MGI
Official Full Name	SET and MYND domain containing 4 provided by MGI
Primary source	MGI:MGI:2442796
See related	Ensembl:ENSMUSG00000018809
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	G430029E23Rik
Expression	Ubiquitous expression in CNS E18 (RPKM 2.8), kidney adult (RPKM 2.7) and 28 other tissues See more
Orthologs	human all

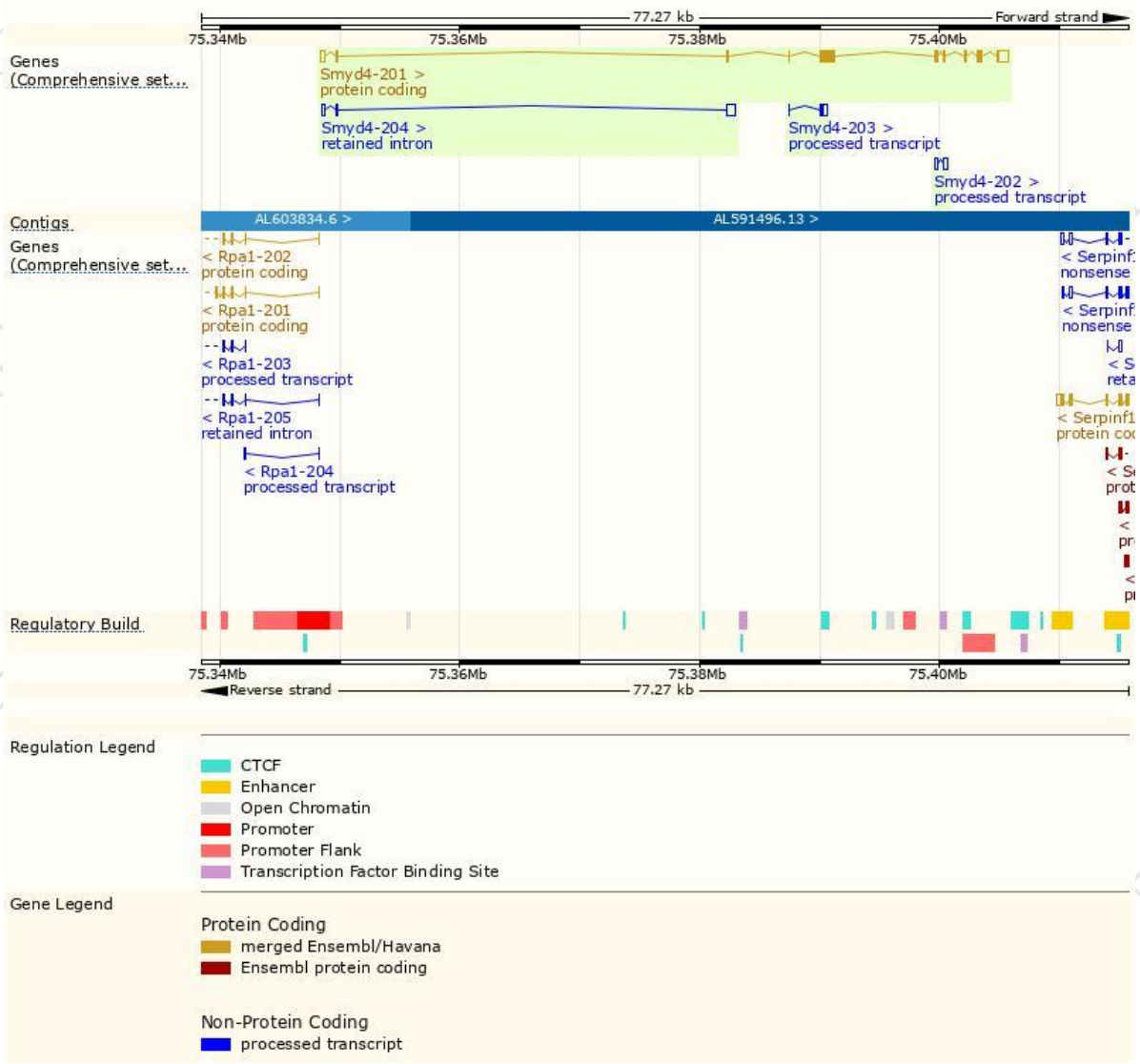
Transcript information（Ensembl）

The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Smyd4-201	ENSMUST00000044530.2	3517	799aa	Protein coding	CCDS48848	Q8BTK5	TSL:1 GENCODE basic APPRIS P1
Smyd4-202	ENSMUST00000135774.1	527	No protein	Processed transcript	-	-	TSL:2
Smyd4-203	ENSMUST00000145888.1	516	No protein	Processed transcript	-	-	TSL:5
Smyd4-204	ENSMUST00000157055.1	1172	No protein	Retained intron	-	-	TSL:1

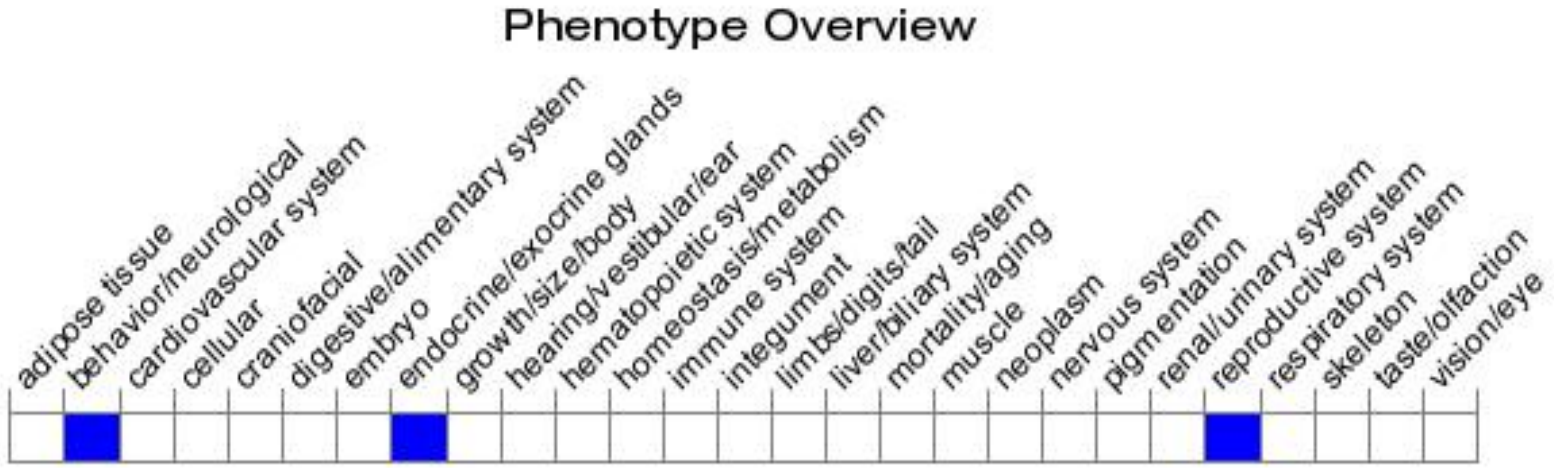
The strategy is based on the design of *Smyd4-201* transcript,the transcription is shown below:

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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