

***Smc4* Cas9-CKO Strategy**

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Project Overview

Project Name

Smc4

Project type

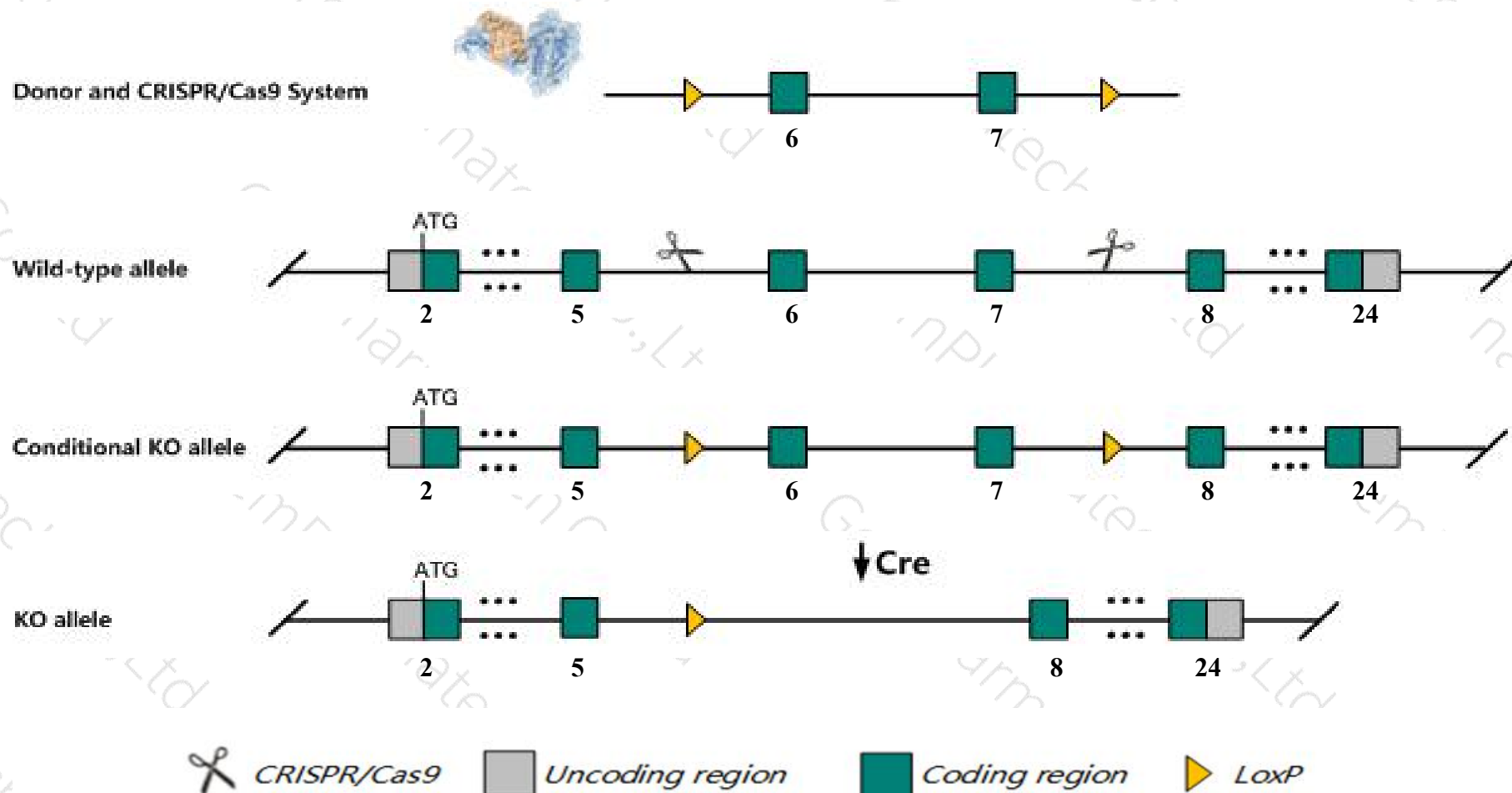
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Smc4* gene. The schematic diagram is as follows:



Technical routes

- The *Smc4* gene has 11 transcripts. According to the structure of *Smc4* gene, exon6-exon7 of *Smc4-201* (ENSMUST00000042901.14) transcript is recommended as the knockout region. The region contains 293bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Smc4* 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.

- The *Smc4* gene is located on the Chr3. 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.
- Transcript *Smc4*-204&208&209&210 may not be affected .
- The N-terminal of *Smc4* gene will remain 227aa,it may remain the partial function of *Smc4* gene.
- 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)

Smc4 structural maintenance of chromosomes 4 [Mus musculus (house mouse)]

Gene ID: 70099, updated on 31-Jan-2019

Summary



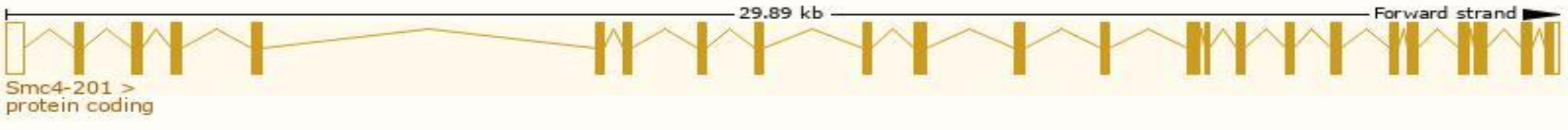
Official Symbol	Smc4 provided by MGI
Official Full Name	structural maintenance of chromosomes 4 provided by MGI
Primary source	MGI:MGI:1917349
See related	Ensembl:ENSMUSG00000034349
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	2500002A22Rik, C79747, SMC-4, Smc4l1
Expression	Broad expression in liver E14 (RPKM 30.9), CNS E11.5 (RPKM 28.6) and 16 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

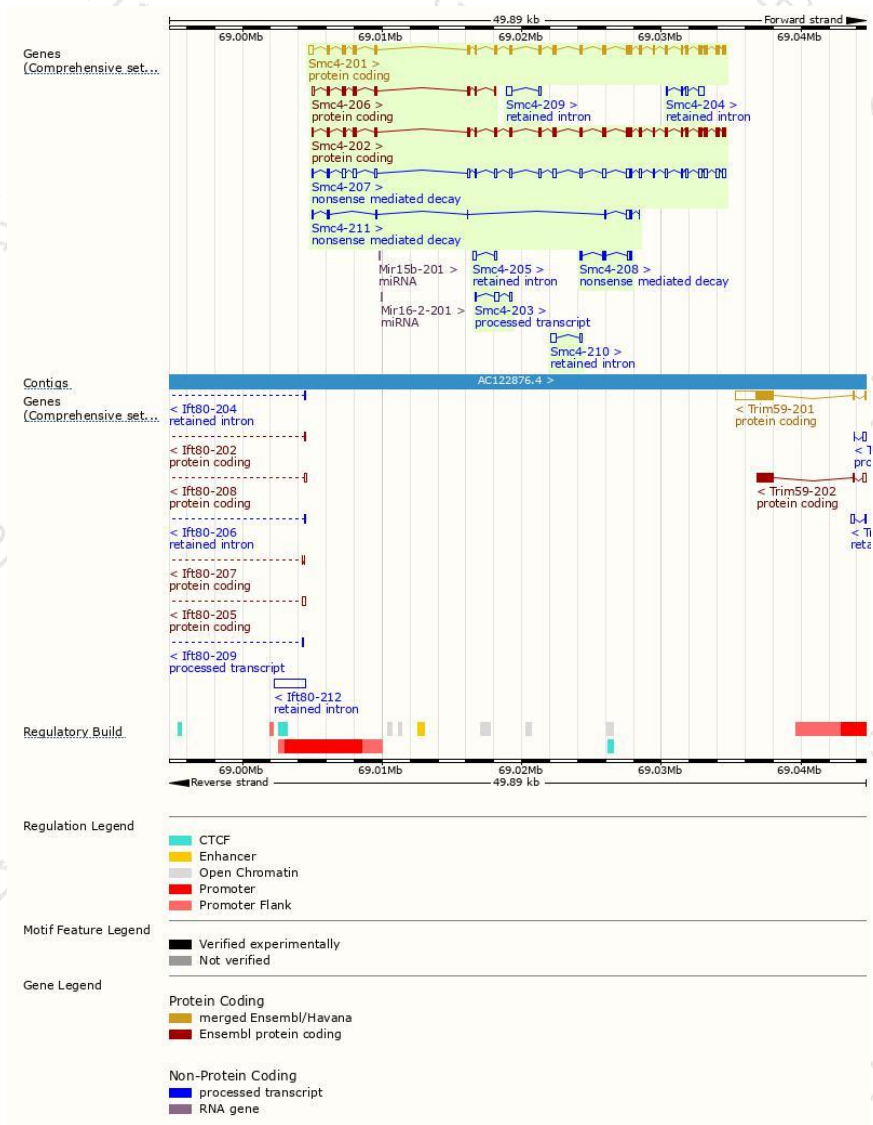
The gene has 11 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Smc4-201	ENSMUST00000042901.14	4316	1286aa	Protein coding	CCDS17401	Q8CG47	TSL:1 GENCODE basic APPRIS P1
Smc4-202	ENSMUST00000107803.6	3983	1261aa	Protein coding	-	E9Q2X6	TSL:5 GENCODE basic
Smc4-206	ENSMUST00000136502.7	1163	337aa	Protein coding	-	Q3U763	CDS 3' incomplete TSL:1
Smc4-207	ENSMUST00000148385.7	4057	46aa	Nonsense mediated decay	-	D6RCX2	TSL:1
Smc4-211	ENSMUST00000195525.1	784	56aa	Nonsense mediated decay	-	A0A0A6YX07	TSL:5
Smc4-208	ENSMUST00000149174.2	557	109aa	Nonsense mediated decay	-	A0A0A6YXY3	CDS 5' incomplete TSL:3
Smc4-203	ENSMUST00000124983.1	496	No protein	Processed transcript	-	-	TSL:5
Smc4-204	ENSMUST00000128118.1	756	No protein	Retained intron	-	-	TSL:2
Smc4-209	ENSMUST00000156354.1	576	No protein	Retained intron	-	-	TSL:2
Smc4-210	ENSMUST00000194693.1	549	No protein	Retained intron	-	-	TSL:2
Smc4-205	ENSMUST00000128134.1	393	No protein	Retained intron	-	-	TSL:2

The strategy is based on the design of *Smc4-201* transcript,The transcription is shown below



Genomic location distribution



Protein domain



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

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