Smarcc2 Cas9-CKO Strategy

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Overview

Target Gene Name
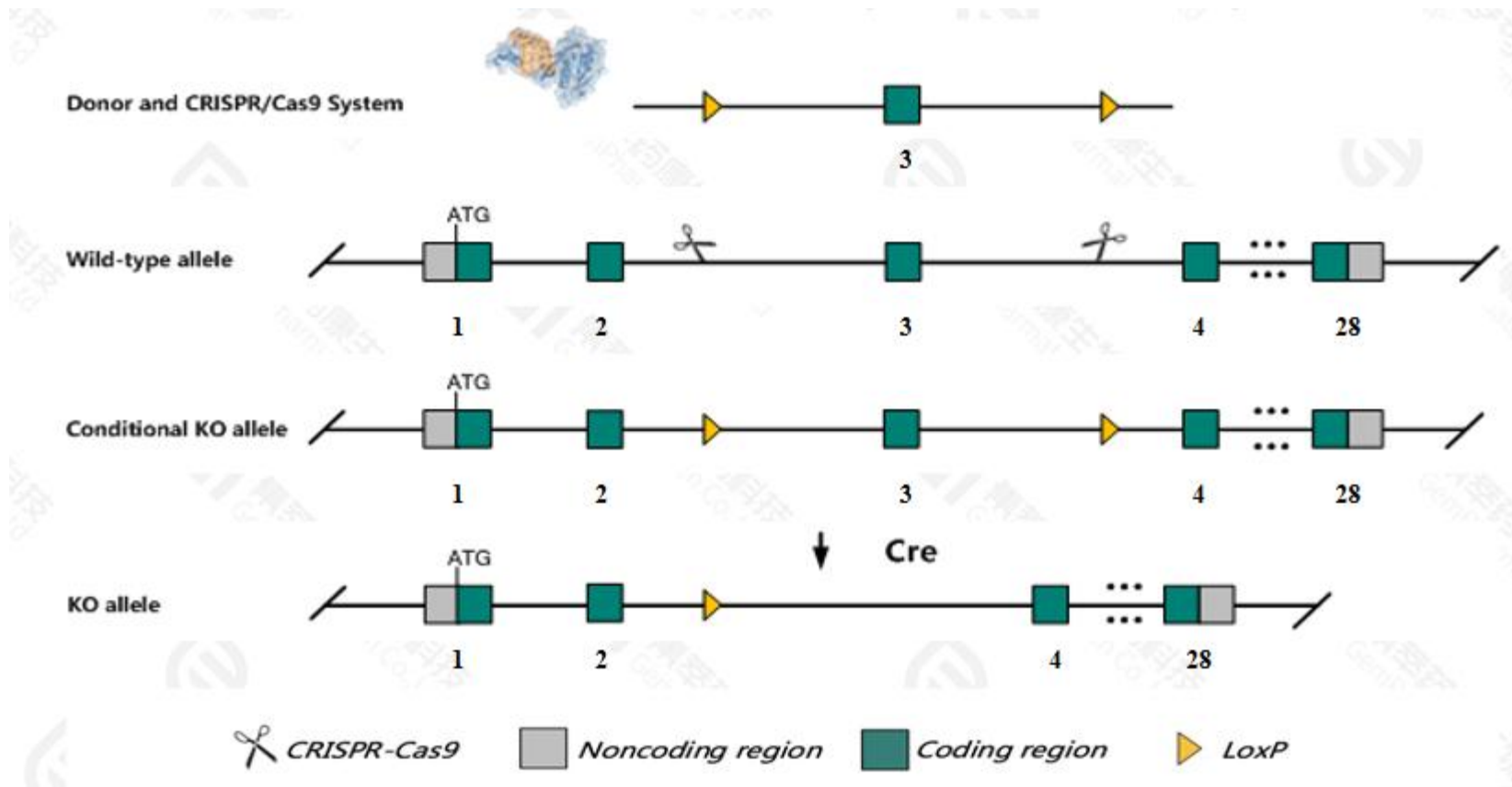
- Smarcc2

Project Type

- Cas9-CKO

Genetic Background

- C57BL/6JGpt

Strain Strategy

Schematic representation of CRISPR-Cas9 engineering used to edit the *Smarcc2* gene.

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Technical Information

- The *Smarcc2* gene has 6 transcripts. According to the structure of *Smarcc2* gene,exon3 of *Smarcc2-203*(ENSMUST00000105235.10) transcript is recommended as the knockout region. The region contains 86bp of coding sequences. Knocking out the region will result in disruption of protein function.

- In this project we use CRISPR-Cas9 technology to modify *Smarcc2* 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 on-target amplicon sequencing. A stable F1-generation mouse strain was obtained by mating positive F0-generation mice with C57BL/6JGpt mice and confirmation of the desired mutant allele was carried out by PCR and on-target amplicon sequencing.

- 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.

Gene Information

Smarcc2 SWI/SNF related, matrix associated, actin dependent regulator of chromatin, subfamily c, member 2 [*Mus musculus* (house mouse)]

Gene ID: 68094, updated on 8-Jan-2023

⬇ **Download Datasets**

🔺 **Summary**   ⌃ ?

Official Symbol	Smarcc2 provided by MGI
Official Full Name	SWI/SNF related, matrix associated, actin dependent regulator of chromatin, subfamily c, member 2 provided by MGI
Primary source	MGI:MGI:1915344
See related	Ensembl:ENSMUSG00000025369 AllianceGenome:MGI:1915344
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	5930405J04Rik
Summary	Enables chromatin binding activity. Acts upstream of or within negative regulation of transcription by RNA polymerase II. Part of SWI/SNF complex; nBAF complex; and npBAF complex. Is expressed in cranial ganglion; genitourinary system; and inner ear. Orthologous to human SMARCC2 (SWI/SNF related, matrix associated, actin dependent regulator of chromatin subfamily c member 2). [provided by Alliance of Genome Resources, Apr 2022]
Expression	Ubiquitous expression in CNS E14 (RPKM 85.9), whole brain E14.5 (RPKM 78.9) and 28 other tissues See more
Orthologs	human all
NEW	Try the new Gene table Try the new Transcript table

🔺 **Genomic context**   ⌃ ?

Location:	10; 10 D3
Exon count:	29

See Smarcc2 in Genome Data Viewer

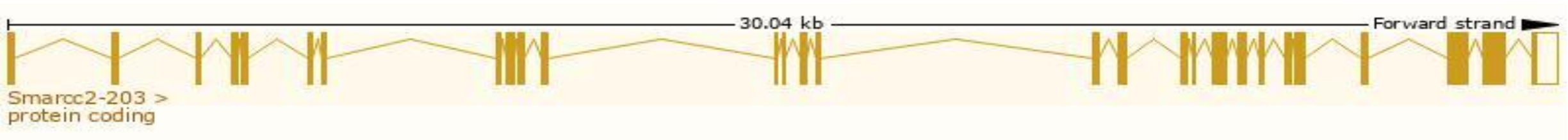Source: https://www.ncbi.nlm.nih.gov/

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Transcript Information

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

Transcript ID	Name	bp	Protein	Biotype	CCDS	UniProt Match	Flags
ENSMUST00000105235.10	Smarcc2-203	4032	1213aa	Protein coding	CCDS48727	Q6PDG5-1	Ensembl Canonical GENCODE basic APPRIS ALT2 TSL:1
ENSMUST00000099131.11	Smarcc2-202	4562	1130aa	Protein coding	CCDS48726	Q3UID0	GENCODE basic APPRIS P2 TSL:1
ENSMUST00000026433.9	Smarcc2-201	4533	1099aa	Protein coding	CCDS24278	Q6PDG5-2	GENCODE basic APPRIS ALT2 TSL:1
ENSMUST00000218228.2	Smarcc2-205	603	142aa	Protein coding		A0A1W2P6N7	GENCODE basic TSL:5
ENSMUST00000220384.2	Smarcc2-206	735	No protein	Protein coding CDS not defined		-	TSL:3
ENSMUST00000217751.2	Smarcc2-204	865	No protein	Retained intron		-	TSL:5

The strategy is based on the design of *Smarcc2*-203 transcript, the transcription is shown below:
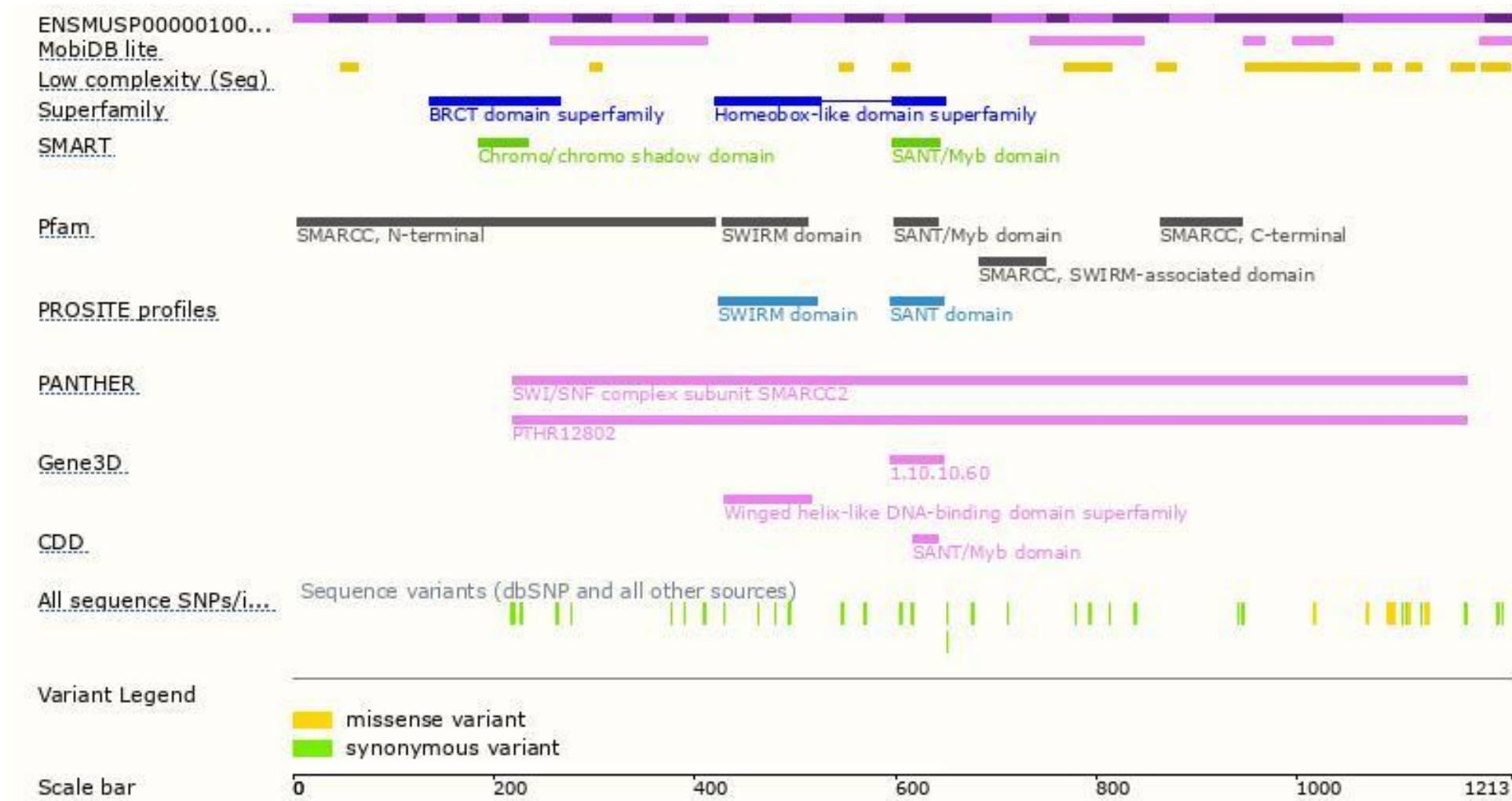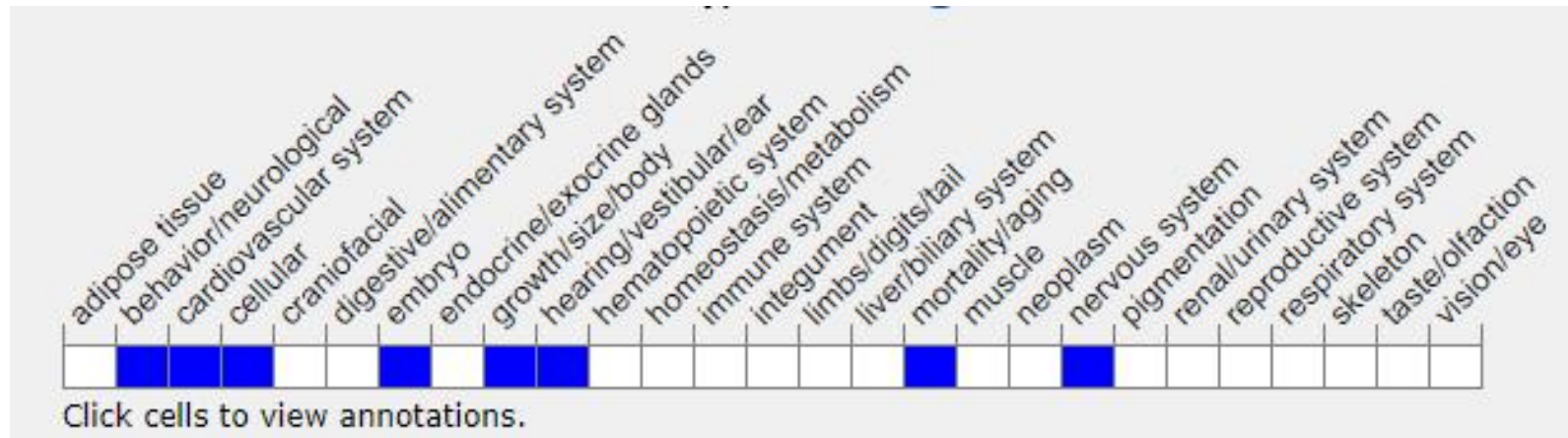

Source: https://www.ensembl.org

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Genomic Information

Source: : https://www.ensembl.org

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Protein Information

Source: : https://www.ensembl.org

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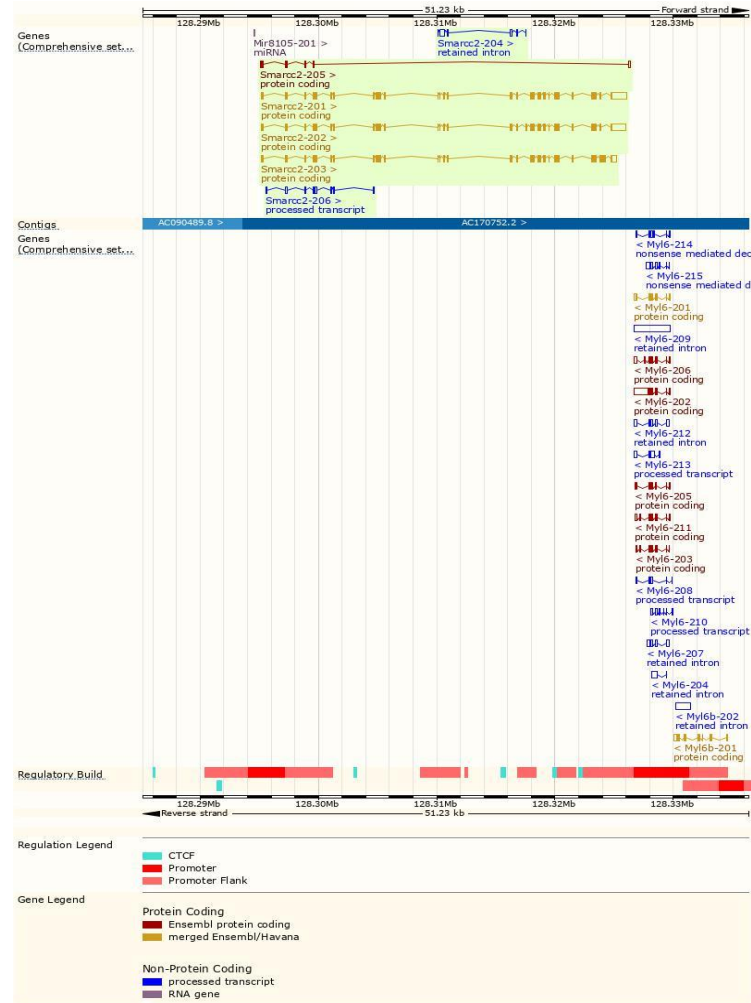
Mouse Phenotype Information (MGI)

Click cells to view annotations.

- Phenotypes affected by the mutations of *Smarcc2* gene are marked in blue. According to the existing MGI data,mice homozygous for a targeted allele exhibit a slight increase in embryo weight at E13.5 and die shortly after birth (P0-P3). Mice homozygous for a conditional allele activated in the brain exhibit reduced cerebral cortical size and thickness.

Source: https://www.informatics.jax.org

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Important Information

- According to the existing MGI data,mice homozygous for a targeted allele exhibit a slight increase in embryo weight at E13.5 and die shortly after birth (P0-P3). Mice homozygous for a conditional allele activated in the brain exhibit reduced cerebral cortical size and thickness.

- The *Smarcc2* gene is located on the Chr10. 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.