

Car7 Cas9-CKO Strategy

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Project Overview

Project Name

Car7

Project type

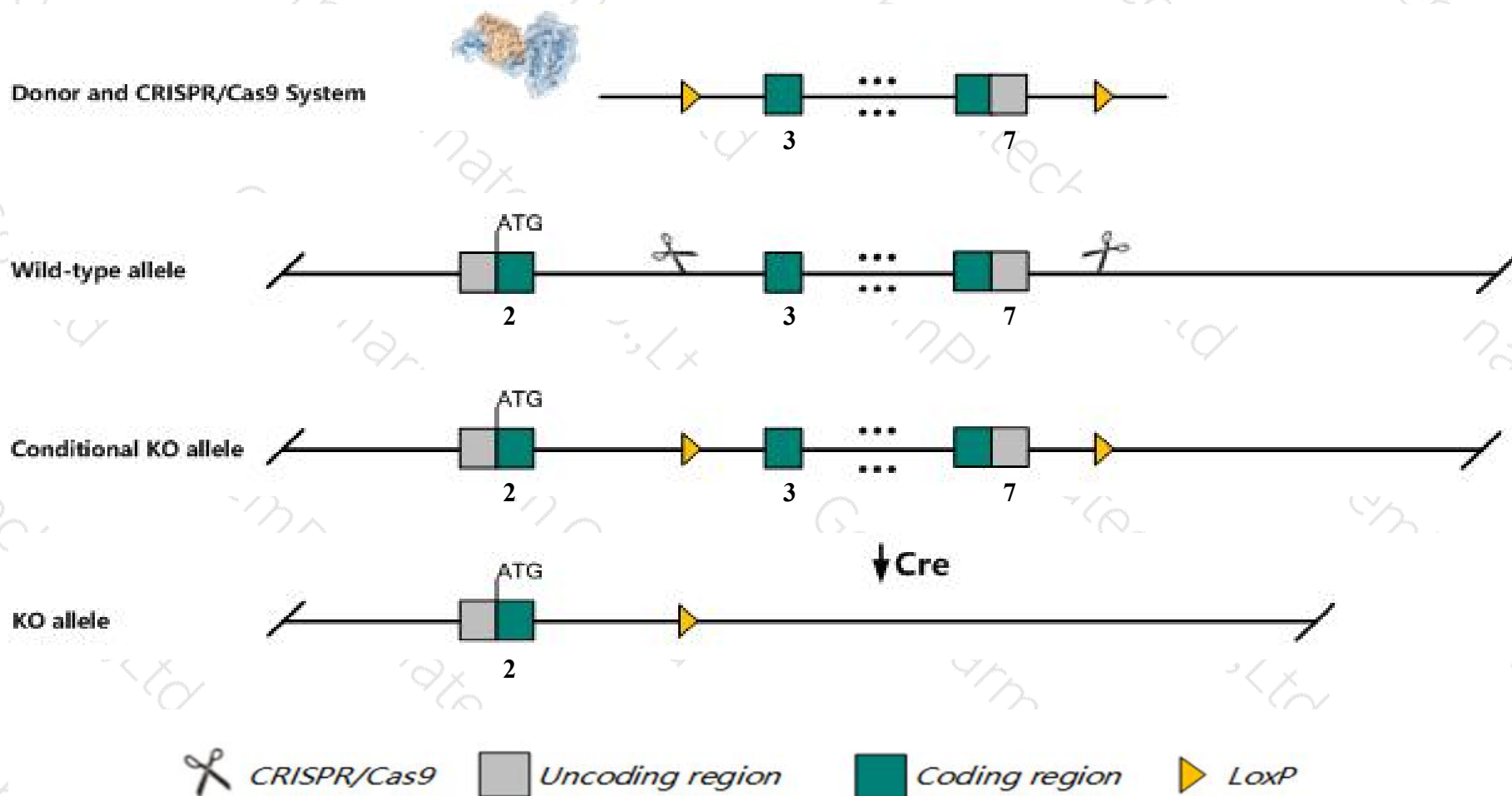
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Car7* gene. The schematic diagram is as follows:



Technical routes

- The *Car7* gene has 5 transcripts. According to the structure of *Car7* gene, exon3-exon7 of *Car7*-202 (ENSMUST00000159416.7) transcript is recommended as the knockout region. The region contains most of the coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Car7* 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 reduced and atypical experimental febrile seizures with the absence of electrographic seizures and abnormal GABA-mediated receptor currents.
- Transcript *Car7*-205 may not be affected.
- The *Car7* gene is located on the Chr8. 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)



Car7 carbonic anhydrase 7 [*Mus musculus* (house mouse)]

Gene ID: 12354, updated on 12-Aug-2019

Summary

- Official Symbol** Car7 provided by [MGI](#)
- Official Full Name** carbonic anhydrase 7 provided by [MGI](#)
- Primary source** [MGI:MGI:103100](#)
- See related** [Ensembl:ENSMUSG00000031883](#)
- 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** Ca7; AV343731
- Expression** Broad expression in cerebellum adult (RPKM 10.1), cortex adult (RPKM 7.5) and 19 other tissues [See more](#)
- Orthologs** [human](#) [all](#)

Genomic context

Location: 8; 8 D3

See Car7 in [Genome Data Viewer](#)

Exon count: 13

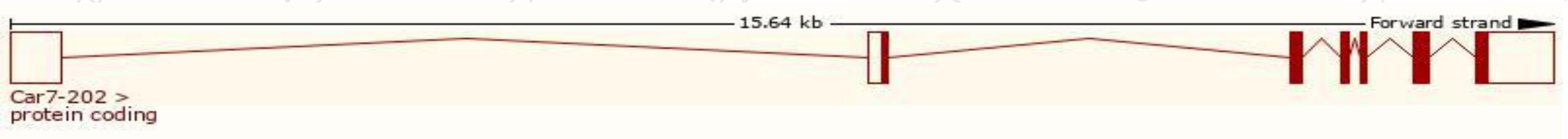
Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	8	NC_000074.6 (104534694..104550347)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	8	NC_000074.5 (107064707..107074243)

Transcript information (Ensembl)

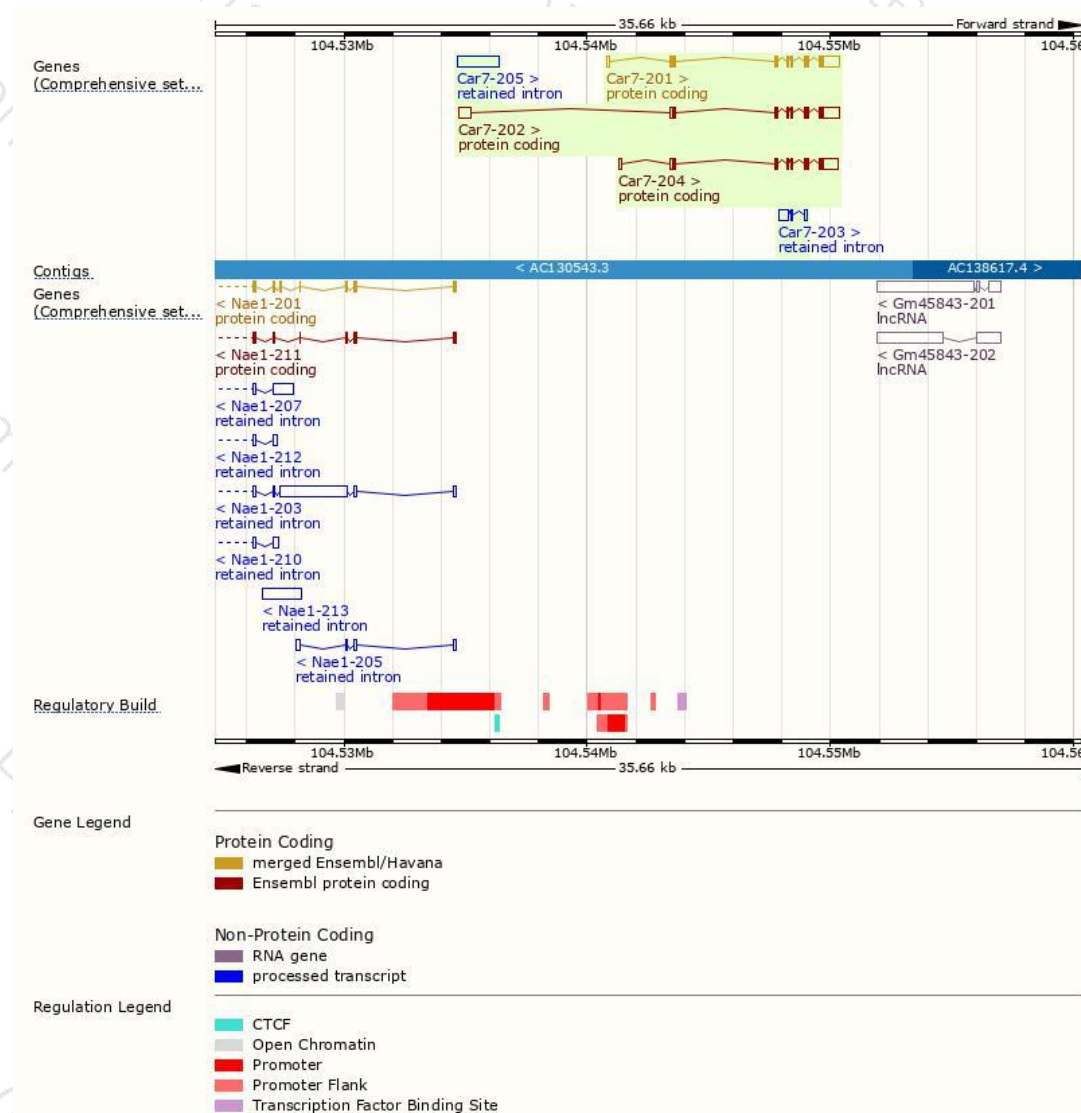
The gene has 5 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Car7-202	ENSMUST00000159416.7	1943	208aa	Protein coding	CCDS80920	G3XA26	TSL:1 GENCODE basic
Car7-201	ENSMUST00000056051.10	1538	264aa	Protein coding	CCDS22581	Q9ERQ8	TSL:1 GENCODE basic APPRIS P1
Car7-204	ENSMUST00000162761.1	1505	208aa	Protein coding	CCDS80920	G3XA26	TSL:1
Car7-205	ENSMUST00000212942.1	1702	No protein	Retained intron	-	-	TSL:NA
Car7-203	ENSMUST00000162399.1	592	No protein	Retained intron	-	-	TSL:3

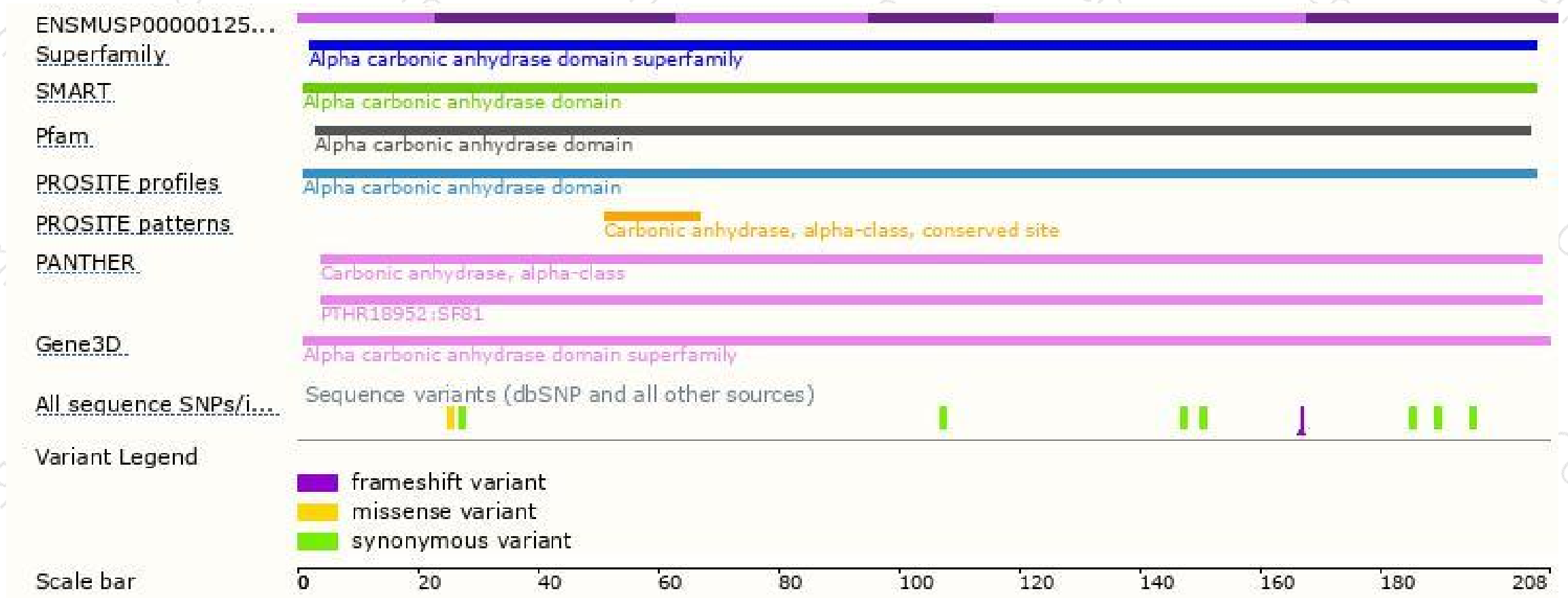
The strategy is based on the design of *Car7-202* transcript,The transcription is shown below



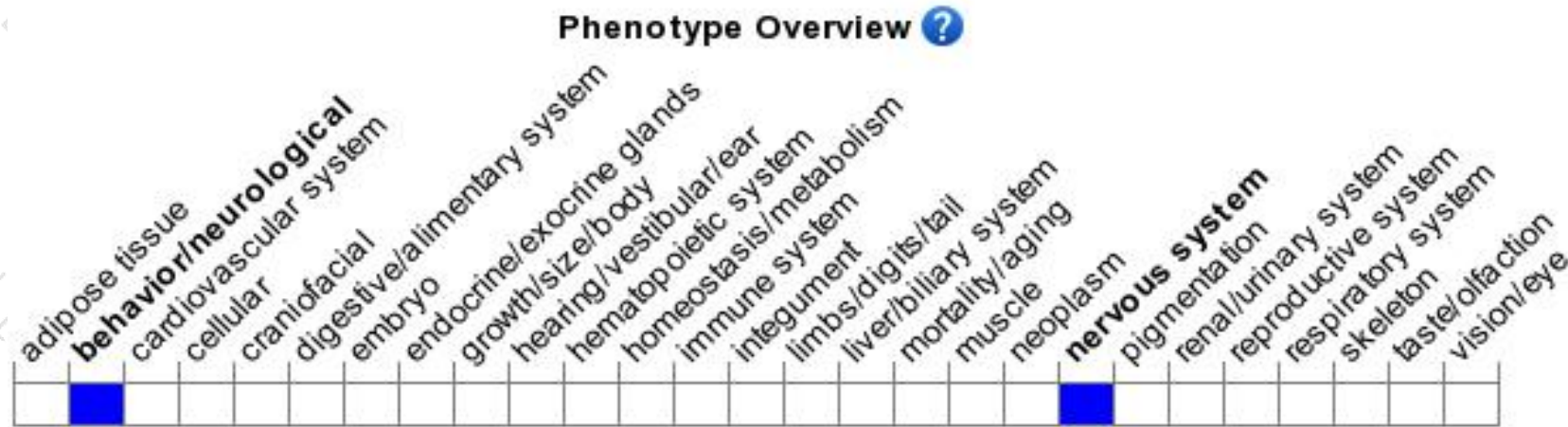
Genomic location distribution



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 reduced and atypical experimental febrile seizures with the absence of electrographic seizures and abnormal GABA-mediated receptor currents.

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

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