

Slc7a4 Cas9-KO Strategy

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Overview

Target Gene Name

- Slc7a4

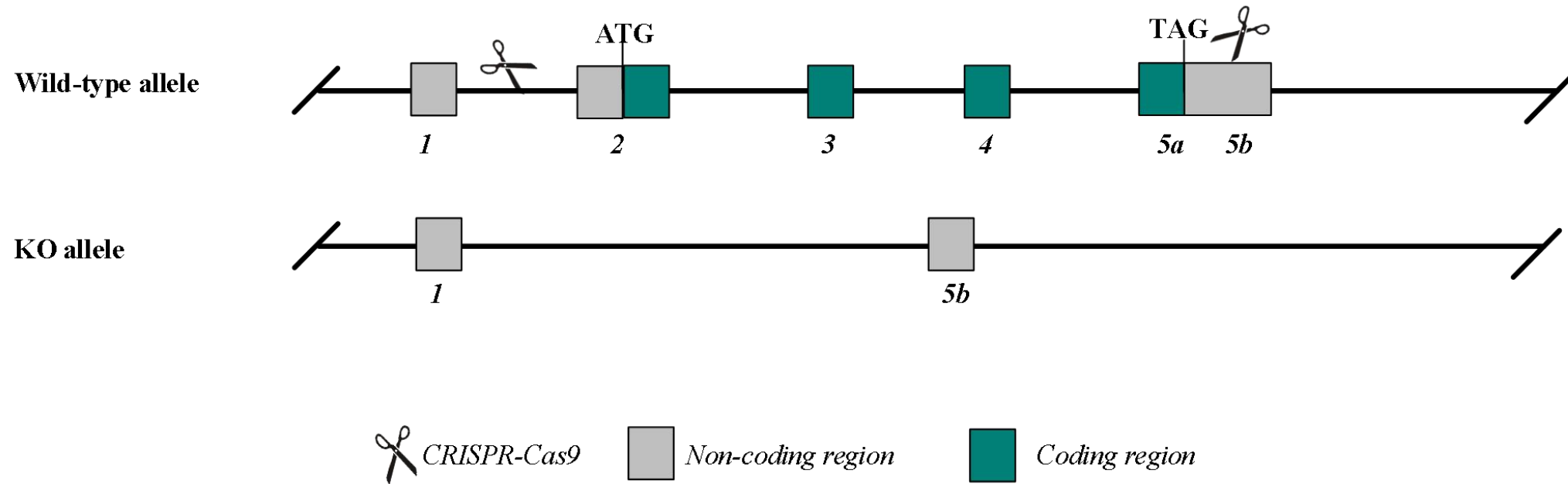
Project Type

- Cas9-KO

Genetic Background

- C57BL/6JGpt

Strain Strategy



Schematic representation of CRISPR-Cas9 engineering used to edit the *Slc7a4* gene.

Technical Information

- The *Slc7a4* gene has 11 transcripts. According to the structure of *Slc7a4* gene, exon 2-exon 5 of *Slc7a4*-202 (ENSMUST00000172164.10) transcript is recommended as the knockout region. The region contains all of the coding sequence. Knocking out the region will result in disruption of protein function.
- In this project we use CRISPR-Cas9 technology to modify *Slc7a4* gene. The brief process is as follows: gRNAs were transcribed in vitro. Cas9 and gRNAs 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.

Gene Information

Slc7a4 solute carrier family 7 (cationic amino acid transporter, y+ system), member 4 [*Mus musculus* (house mouse)]

Gene ID: 224022, updated on 11-Apr-2024

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Summary

Official Symbol	Slc7a4 provided by MGI
Official Full Name	solute carrier family 7 (cationic amino acid transporter, y+ system), member 4 provided by MGI
Primary source	MGI:MGI:2146512
See related	Ensembl:ENSMUSG00000022756 AllianceGenome:MGI:2146512
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
Summary	Predicted to enable amino acid transmembrane transporter activity. Predicted to be involved in amino acid transport. Predicted to be located in membrane. Predicted to be integral component of membrane. Predicted to be active in plasma membrane. Is expressed in several structures, including alimentary system; heart; nervous system; nose; and testis. Orthologous to human SLC7A4 (solute carrier family 7 member 4). [provided by Alliance of Genome Resources, Apr 2022]
Expression	Broad expression in genital fat pad adult (RPKM 44.4), ovary adult (RPKM 14.2) and 16 other tissues See more
Orthologs	human all
NEW	Try the new Gene table Try the new Transcript table

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

Transcript Information

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

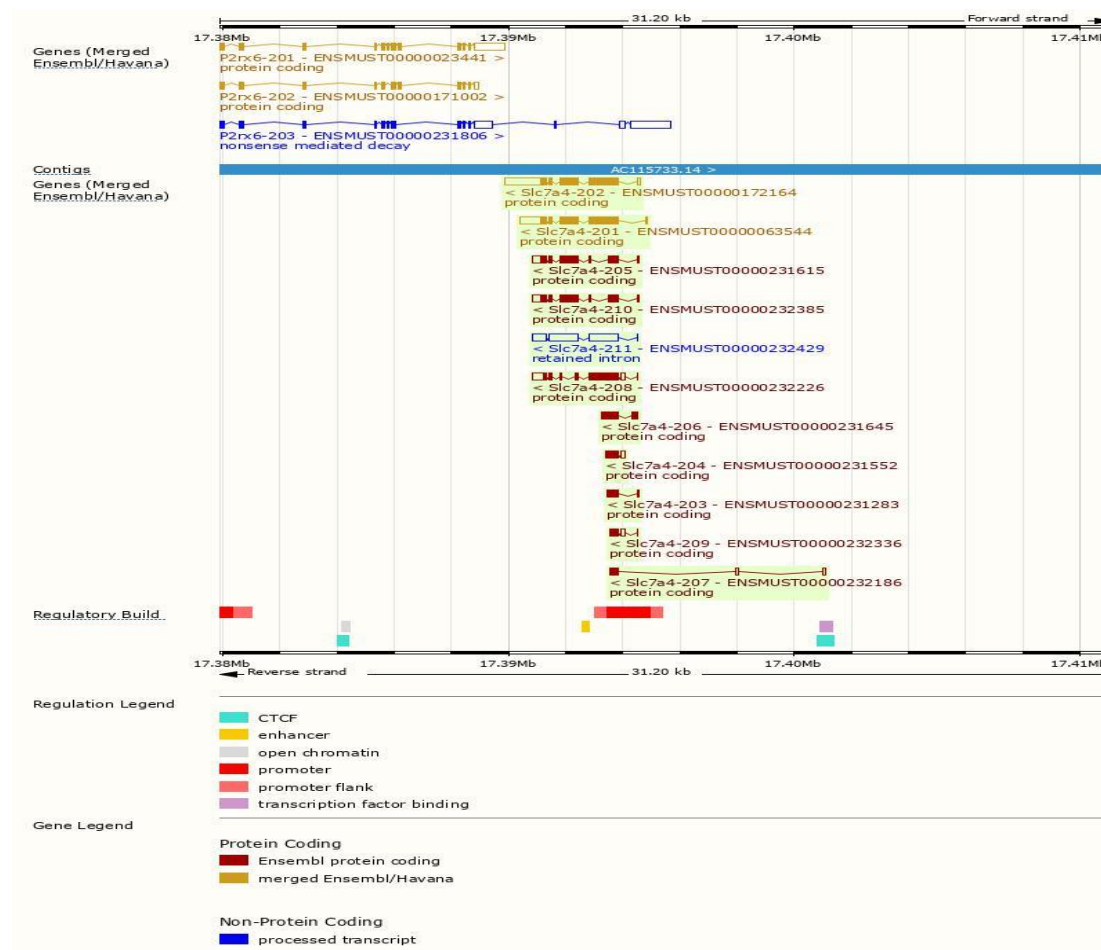
Show/hide columns (1 hidden)							Filter	
Transcript ID	Name	bp	Protein	Biotype	CCDS	UniProt Match	Flags	
ENSMUST00000063544.11	Slc7a4-201	2758	635aa	Protein coding	CCDS28008	Q8BLQ7	GENCODE basic	APPRIS P1 TSL:1
ENSMUST00000172164.10	Slc7a4-202	3281	635aa	Protein coding	CCDS28008	Q8BLQ7	Ensembl Canonical	GENCODE basic APPRIS P1 TSL:1
ENSMUST00000231283.2	Slc7a4-203	455	117aa	Protein coding		A0A338P685	CDS 3' incomplete	
ENSMUST00000231552.2	Slc7a4-204	596	140aa	Protein coding		A0A338P740	CDS 3' incomplete	
ENSMUST00000231615.2	Slc7a4-205	1711	430aa	Protein coding		A0A338P754	GENCODE basic	
ENSMUST00000231645.2	Slc7a4-206	763	242aa	Protein coding		A0A338P6C5	CDS 3' incomplete	
ENSMUST00000232186.2	Slc7a4-207	440	76aa	Protein coding		A0A338P6V0	CDS 3' incomplete	
ENSMUST00000232226.2	Slc7a4-208	1920	452aa	Protein coding		Q91WD3	GENCODE basic	
ENSMUST00000232336.2	Slc7a4-209	435	81aa	Protein coding		A0A338P7B4	CDS 3' incomplete	
ENSMUST00000232385.2	Slc7a4-210	1714	430aa	Protein coding		A0A338P754	GENCODE basic	
ENSMUST00000232429.2	Slc7a4-211	2577	No protein	Retained intron		-	-	

The strategy is based on the design of *Slc7a4-202* transcript, the transcription is shown below:

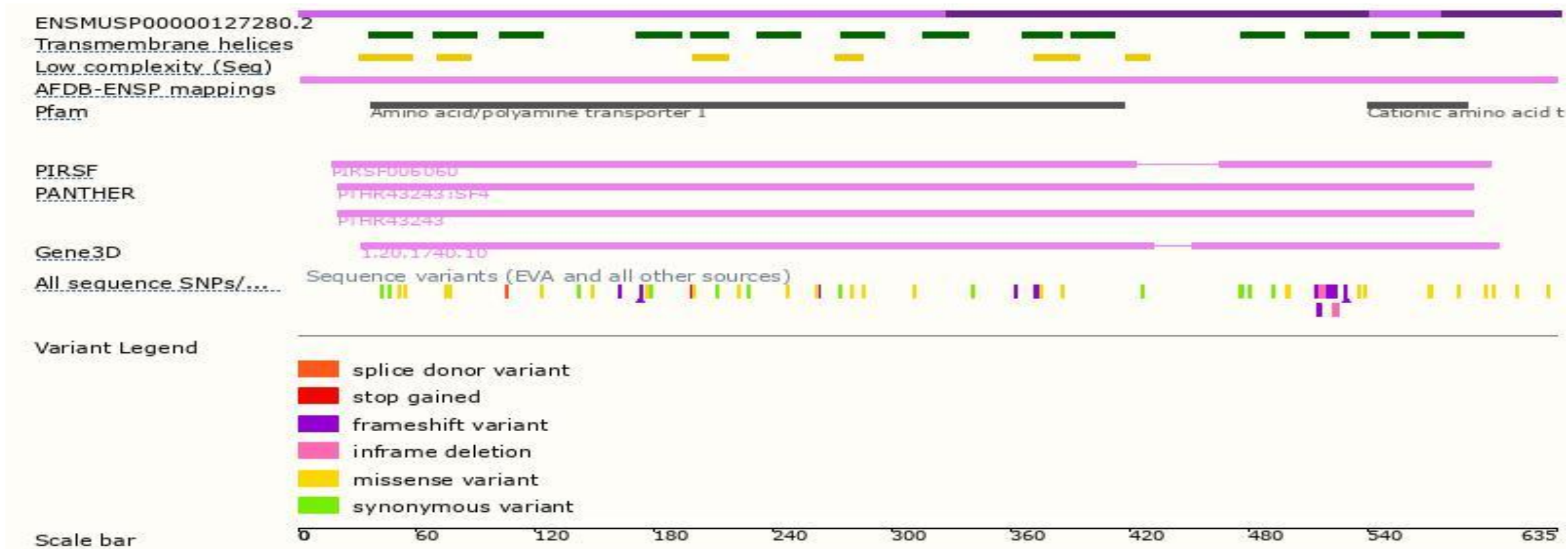


Source: <https://www.ensembl.org>

Genomic Information



Protein Information



Important Information

- Transcript *Slc7a4-203&Slc7a4-204&Slc7a4-206&Slc7a4-207&Slc7a4-209* may not be affected.
- The KO region contains the functional region of the *P2rx6* gene. Knockout the region may affect its function of *P2rx6* gene.
- *Slc7a4* is located on Chr16. If the knockout mice are crossed with other mouse strains to obtain double homozygous mutant offspring, please avoid the situation that the second gene is on the same chromosome.
- This Strategy is designed based on genetic information in existing databases. Due to the complexity of biological processes, all risks of the mutation on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.