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Mxra8 Cas9-KO Strategy

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Reviewer: Jia Yu

Design Date: 2023-08-2

Overview

Target Gene Name

- Mxra8

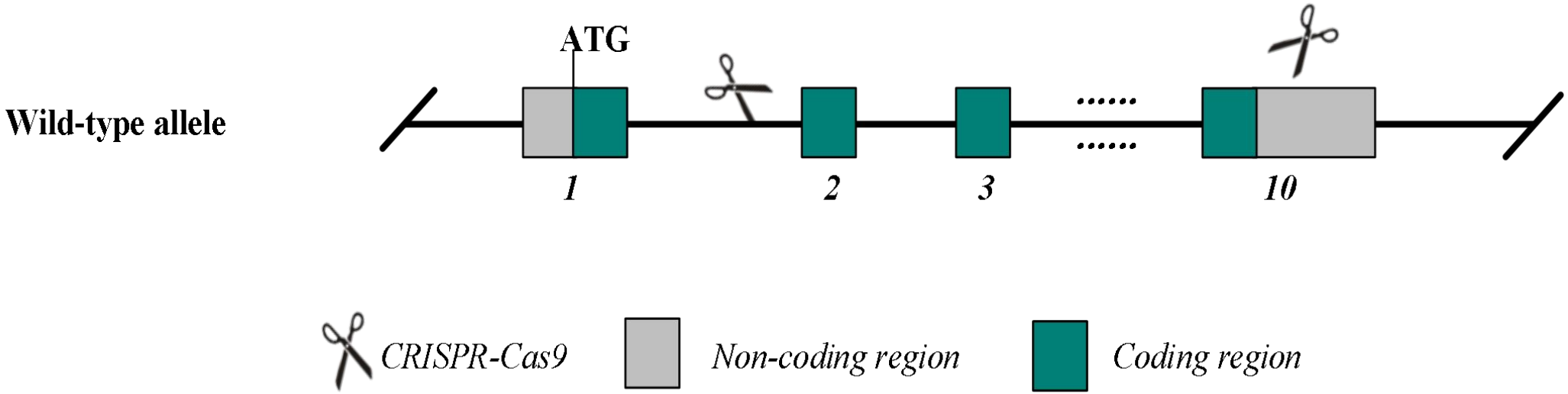
Project Type

- Cas9-KO

Genetic Background

- C57BL/6JGpt

Strain Strategy



Schematic representation of CRISPR-Cas9 engineering used to edit the *Mxra8* gene.

Technical Information

- The *Mxra8* gene has 7 transcripts. According to the structure of *Mxra8* gene, exon2-10 of *Mxra8*-201 (ENSMUST00000030947.4) transcript is recommended as the knockout region. The region contains most of coding sequences. Knocking out the region will result in disruption of protein function.
- In this project we use CRISPR-Cas9 technology to modify *Mxra8* 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

Mxra8 matrix-remodelling associated 8 [*Mus musculus* (house mouse)]

Download Datasets

Gene ID: 74761, updated on 21-Jun-2023

Summary

Official Symbol	Mxra8 provided by MGI
Official Full Name	matrix-remodelling associated 8 provided by MGI
Primary source	MGI:MGI:1922011
See related	Ensembl:ENSMUSG00000029070 AllianceGenome:MGI:1922011
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	Asp3; Dicam; 1200013A08Rik; 1700095D18Rik
Summary	Acts upstream of or within establishment of glial blood-brain barrier. Located in cell surface. Is expressed in brain ventricle and choroid plexus; heart valve; and skeleton. Orthologous to human MXRA8 (matrix remodeling associated 8). [provided by Alliance of Genome Resources, Apr 2022]
Expression	Broad expression in lung adult (RPKM 383.7), ovary adult (RPKM 167.8) and 15 other tissues See more
Orthologs	human all

NEW **Try the new Gene table**

Try the new Transcript table

Genomic context

Location: 4 E2; 4 87.58 cM — See Mxra8 in Genome Data Viewer

Exon count: 10

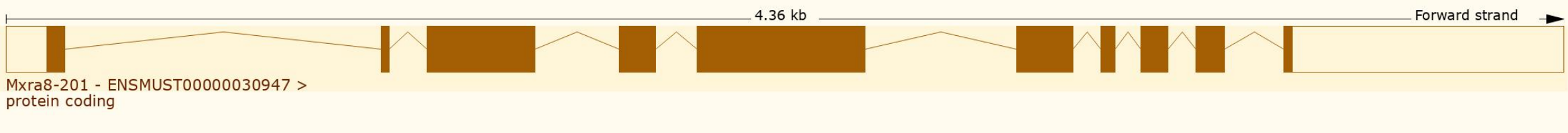
Source: https://www.ncbi.nlm.nih.gov/

Transcript Information

The gene has 7 transcripts, all transcripts are shown below:

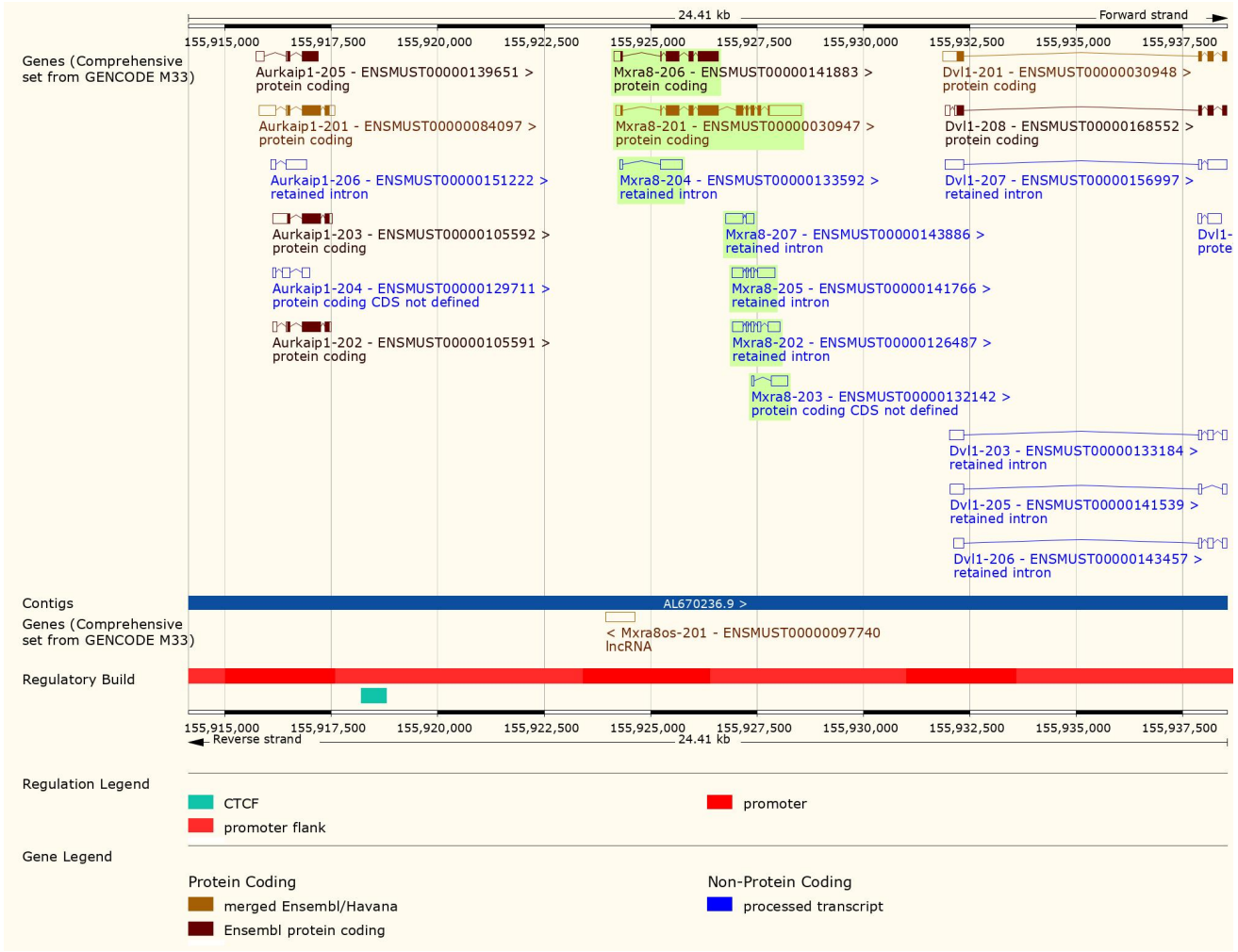
Transcript ID	Name	bp	Protein	Biotype	CCDS	UniProt Match	Flags
ENSMUST00000030947.4	Mxra8-201	2203	442aa	Protein coding	CCDS19044	Q9DBV4	Ensembl Canonical, GENCODE basic, APPRIS P1, TSL:1
ENSMUST00000141883.8	Mxra8-206	1097	311aa	Protein coding		A2AD97	TSL:2, CDS 3' incomplete
ENSMUST00000132142.2	Mxra8-203	449	No protein	Protein coding CDS not defined		-	TSL:5
ENSMUST00000141766.8	Mxra8-205	788	No protein	Retained intron		-	TSL:3
ENSMUST00000126487.2	Mxra8-202	715	No protein	Retained intron		-	TSL:1
ENSMUST00000143886.2	Mxra8-207	594	No protein	Retained intron		-	TSL:3
ENSMUST00000133592.2	Mxra8-204	564	No protein	Retained intron		-	TSL:3

The strategy is based on the design of *Mxra8*-201 transcript, the transcription is shown below:



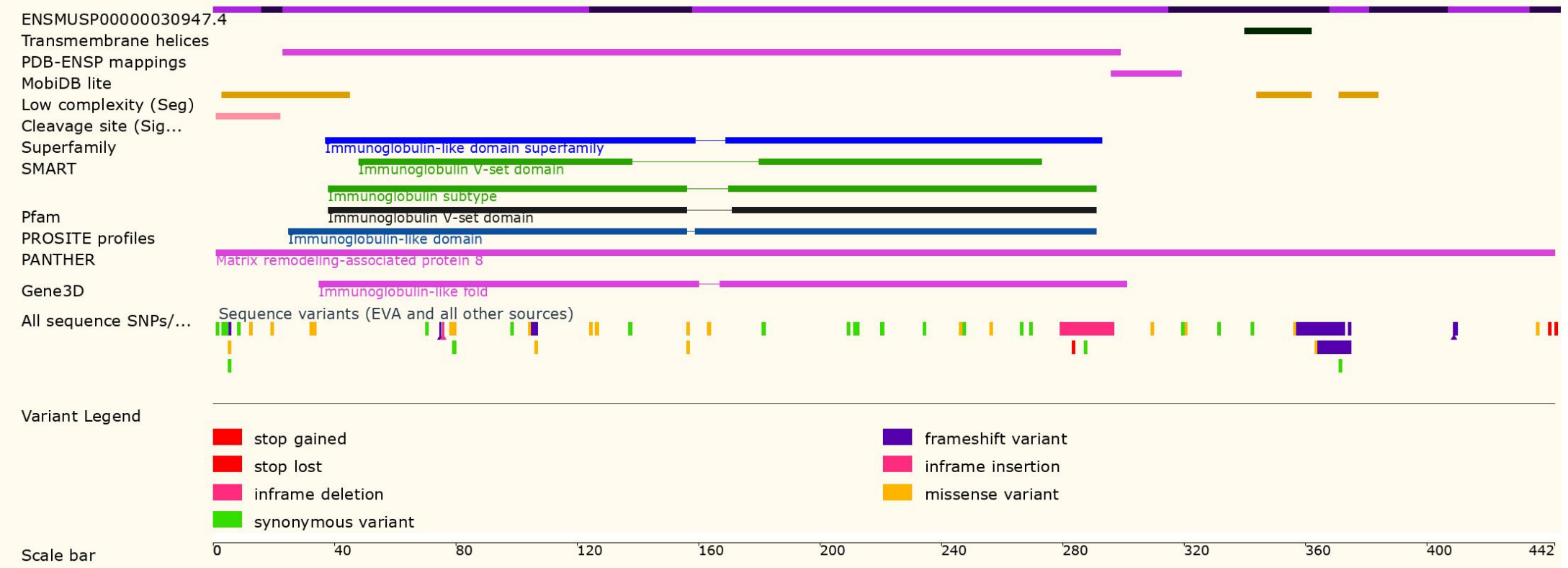
Source: https://www.ensembl.org

Genomic Information



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

Protein Information



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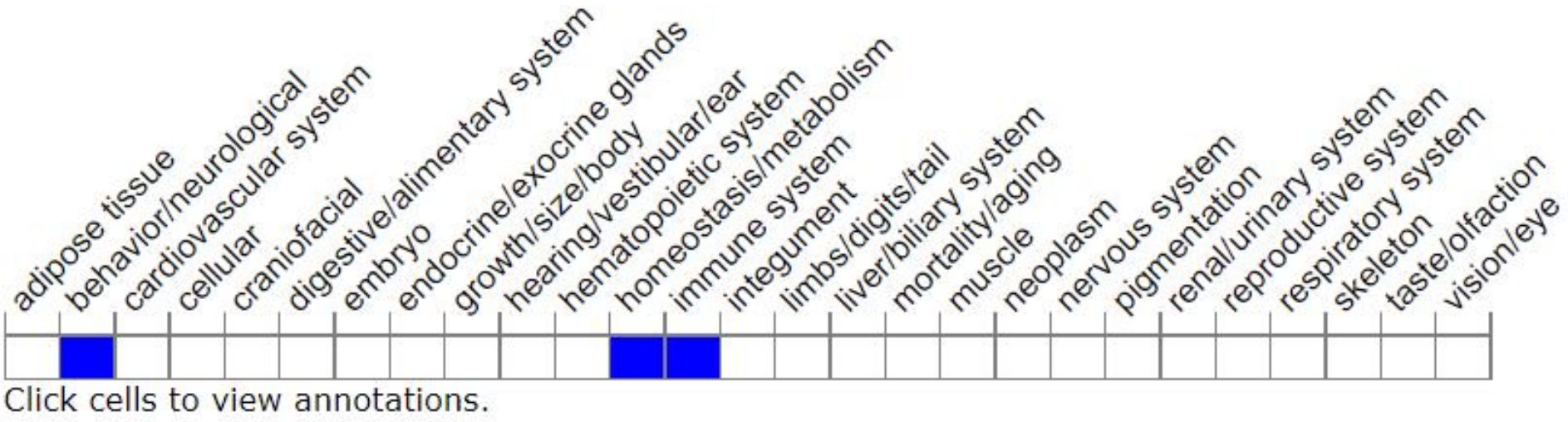
Source: : https://www.ensembl.org

Mouse Phenotype Information (MGI)



- Phenotypic analysis of mice homozygous for a gene trap allele indicates this mutation has no notable phenotype in any parameter tested in a high-throughput screen. Mice homozygous for two alleles with intragenic deletions in the Ig-like domain 2 show decreased infection of musculoskeletal tissues with various alphaviruses.

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

Important Information

- According theMGI data, phenotypic analysis of mice homozygous for a gene trap allele indicates this mutation has no notable phenotype in any parameter tested in a high-throughput screen. Mice homozygous for two alleles with intragenic deletions in the Ig-like domain 2 show decreased infection of musculoskeletal tissues with various alphaviruses.
- The effect of *Mxra8os*-201 and *Dvl1*-201 is unknown.
- *Mxra8* is located on Chr4. 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.