Efna3 Cas9-KO Strategy

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Overview

Target Gene Name
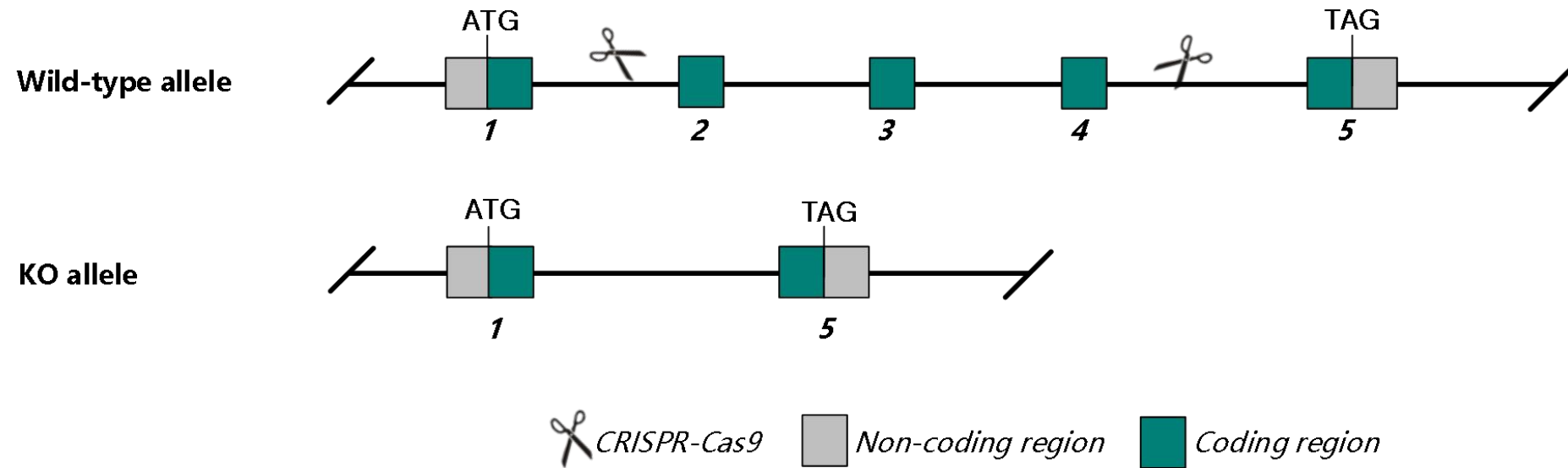
- Efna3

Project Type

- Cas9-KO

Genetic Background

- C57BL/6JGpt

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Strain Strategy

Schematic representation of CRISPR-Cas9 engineering used to edit the *Efna3* gene.

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Technical Information

- The *Efna3* gene has 3 transcripts. According to the structure of *Efna3* gene, exon2-4 of *Efna3*-201 (ENSMUST00000029673.10) transcript is recommended as the knockout region. The region contains 434bp of coding sequences. Knocking out the region will result in disruption of protein function.

- In this project we use CRISPR-Cas9 technology to modify *Efna3* 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

Efna3 ephrin A3 [*Mus musculus* (house mouse)]

Download Datasets

Gene ID: 13638, updated on 26-Sep-2022

Summary

Official Symbol	Efna3 provided by MGI
Official Full Name	ephrin A3 provided by MGI
Primary source	MGI:MGI:106644
See related	Ensembl:ENSMUSG00000028039 AllianceGenome:MGI:106644
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	Epl3; EFL-2; Ehk1-L; LERK-3
Summary	Enables ephrin receptor binding activity. Involved in ephrin receptor signaling pathway. Predicted to be located in membrane. Predicted to be anchored component of membrane. Predicted to be active in plasma membrane. Is expressed in several structures, including alimentary system; central nervous system; early conceptus; genitourinary system; and sensory organ. Orthologous to human EFNA3 (ephrin A3). [provided by Alliance of Genome Resources, Apr 2022]
Expression	Broad expression in CNS E18 (RPKM 18.6), cortex adult (RPKM 12.4) and 15 other tissues See more
Orthologs	human all
NEW	Try the new Gene table
	Try the new Transcript table

Genomic context

Location: 3 F1; 3 39.06 cM

See Efna3 in Genome Data Viewer

Exon count: 6

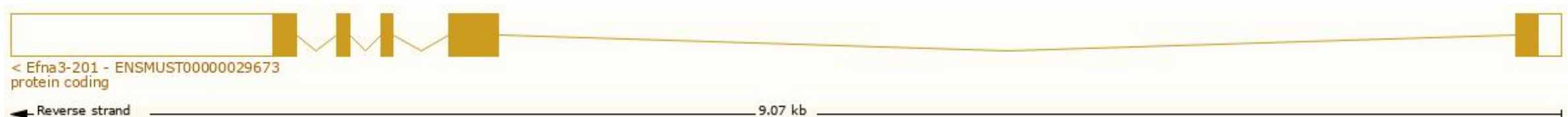Source: https://www.ncbi.nlm.nih.gov/

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Transcript Information

The gene has 3 transcripts, all transcripts are shown below:

Transcript ID	Name	bp	Protein	Biotype	CCDS	UniProt Match	Flags			
ENSMUST00000029673.10	Efna3-201	2363	230aa	Protein coding	CCDS38488	O08545	Ensembl Canonical	GENCODE basic	APPRIS P2	TSL:1
ENSMUST0000020436.2	Efna3-203	742	204aa	Protein coding		A0A0G2JGE9		GENCODE basic	APPRIS ALT2	TSL:5
ENSMUST00000139439.2	Efna3-202	454	No protein	Protein coding CDS not defined		-				TSL:3

The strategy is based on the design of *Efna3*-201 transcript, the transcription is shown below:
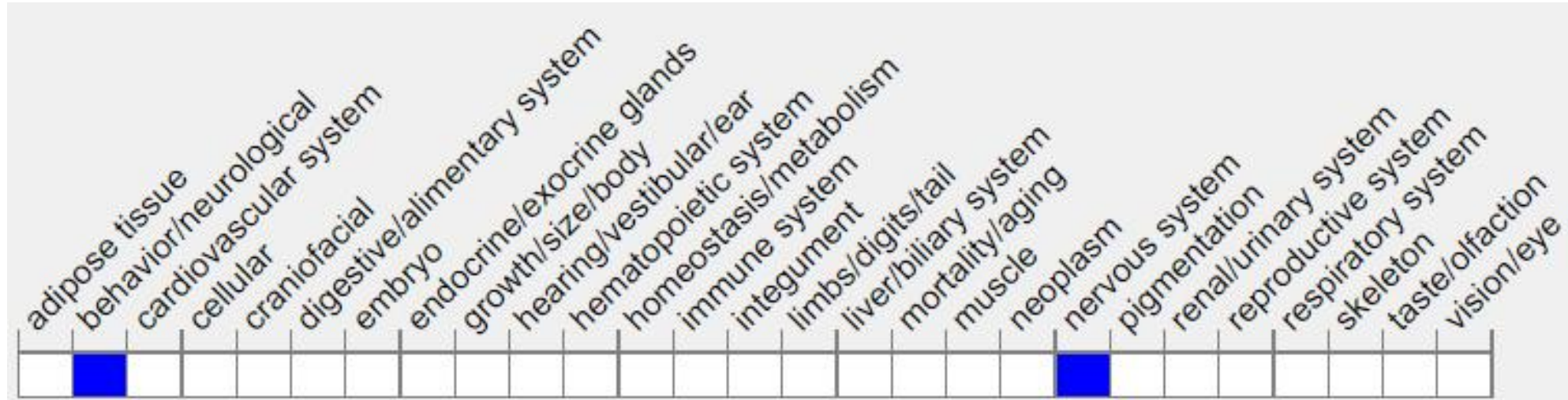

< Efna3-201 - ENSMUST00000029673
protein coding

Reverse strand — 9.07 kb

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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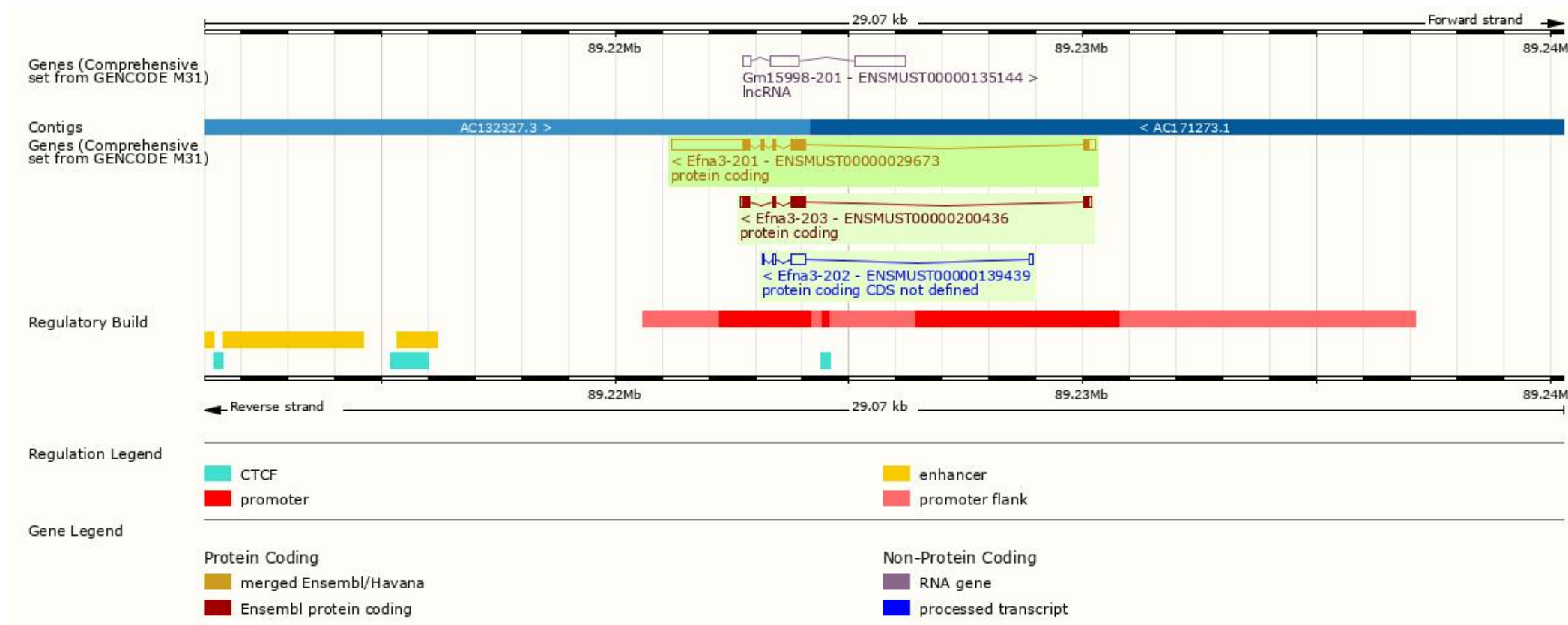
Mouse Phenotype Information (MGI)

- Mice homozygous for a knock-out allele exhibit disorganised and elongated dendritic spine of CA1 pyramidal neuron and reduced hippocampal-dependent learning.

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Important Information

- The effect of *Gm15998*-201 gene is unknown.

- *Efna3* is located on Chr3. 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.

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