Efna5 Cas9-KO Strategy

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Reviewer:	**Ruirui Zhang**
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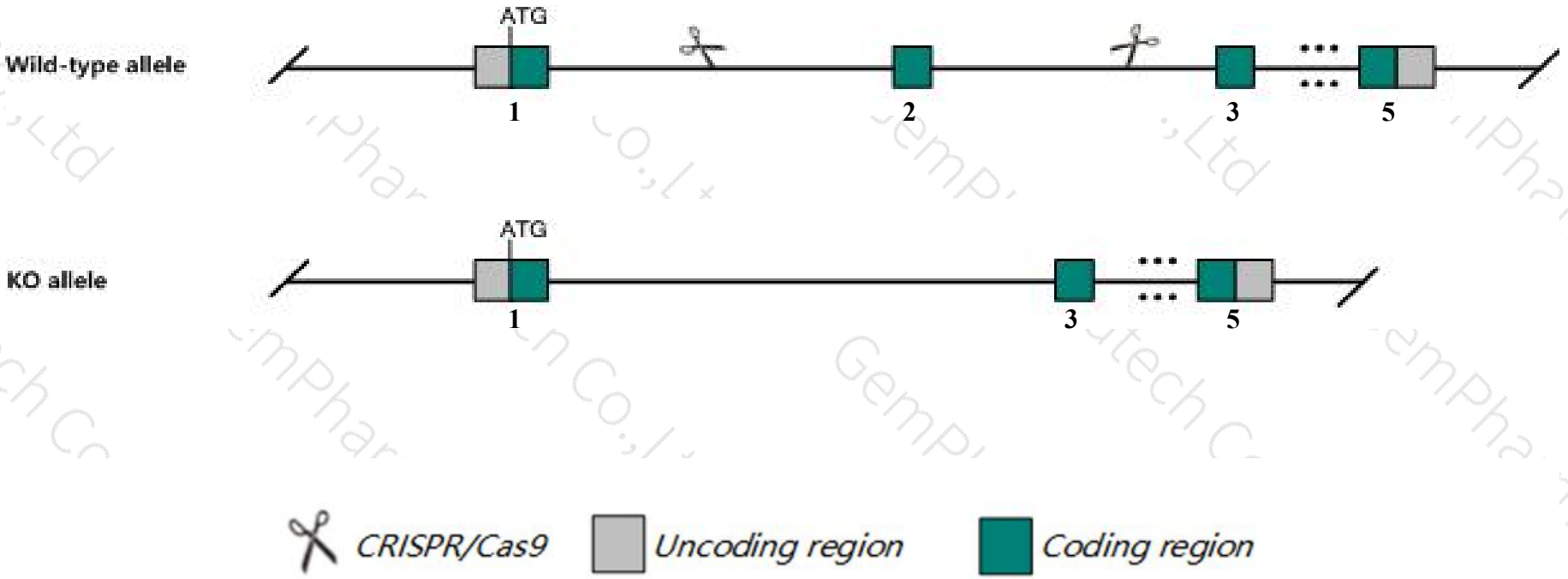
Project Overview

Project Name	***Efna5***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Efna5* gene. The schematic diagram is as follows:



Technical routes

➢ The *Efna5* gene has 2 transcripts. According to the structure of *Efna5* gene, exon2 of *Efna5-201* (ENSMUST00000076840.11) transcript is recommended as the knockout region.The region contains 293bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Efna5* gene. The brief process is as follows: CRISPR/Cas9 system

Notice

- According to the existing MGI data,Homozygotes for targeted null mutations exhibit abnormalities in establishing correct axonal connections involving the retinal, motor, vomeronasal, and tactile axons to their respective targets. Some mutants develop neural tube defects.

- The *Efna5* gene is located on the Chr17. 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 the gene knockout on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

Gene information （NCBI）

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Efna5 ephrin A5 [*Mus musculus* (house mouse)]

Gene ID: 13640, updated on 14-Dec-2019

Summary

Official Symbol	Efna5 provided by MGI
Official Full Name	ephrin A5 provided by MGI
Primary source	MGI:MGI:107444
See related	Ensembl:ENSMUSG00000048915
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	AL-1; Epl7; RAGS; EFL-5; LERK-7; AV158822; Ephrin-A5
Expression	Broad expression in CNS E11.5 (RPKM 7.2), limb E14.5 (RPKM 6.9) and 21 other tissues See more
Orthologs	human all

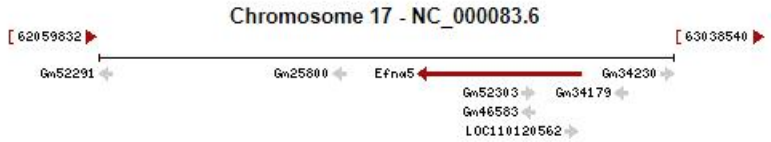
Genomic context

Location: 17 E1.1; 17 32.57 cM

See Efna5 in Genome Data Viewer

Exon count: 8

Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	17	NC_000083.6 (62602957..62881317, complement)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	17	NC_000083.5 (62952306..63230666, complement)

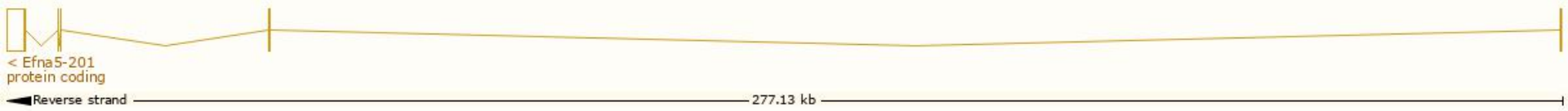


Transcript information（Ensembl）

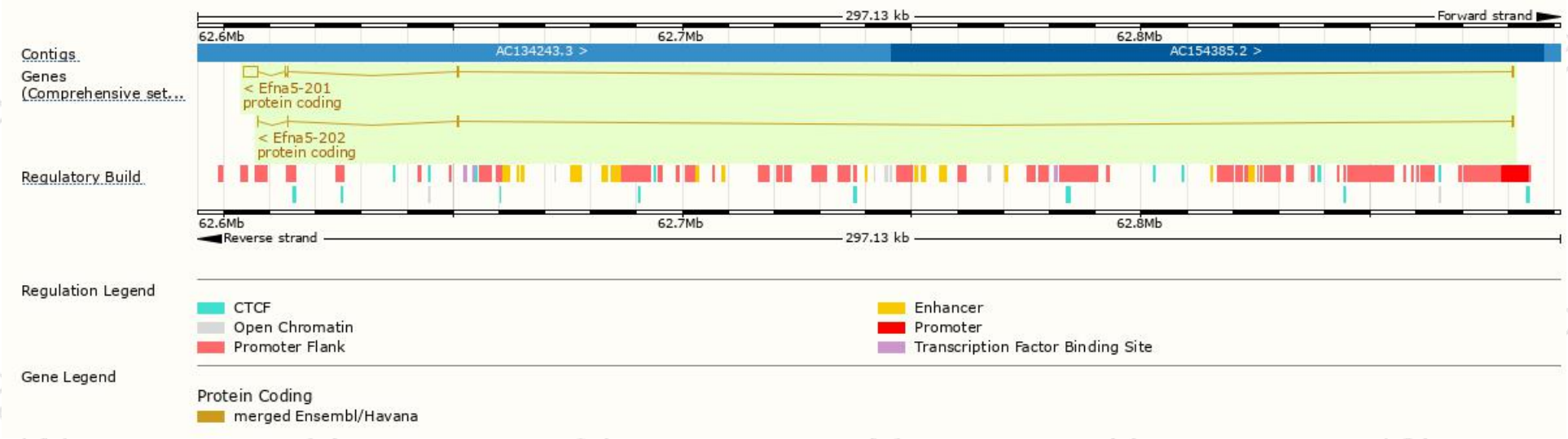
The gene has 2 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Efna5-201	ENSMUST00000076840.11	4032	228aa	Protein coding	CCDS28935	O08543	TSL:1 GENCODE basic APPRIS P4
Efna5-202	ENSMUST00000078839.4	643	201aa	Protein coding	CCDS28934	O08543	TSL:1 GENCODE basic APPRIS ALT1

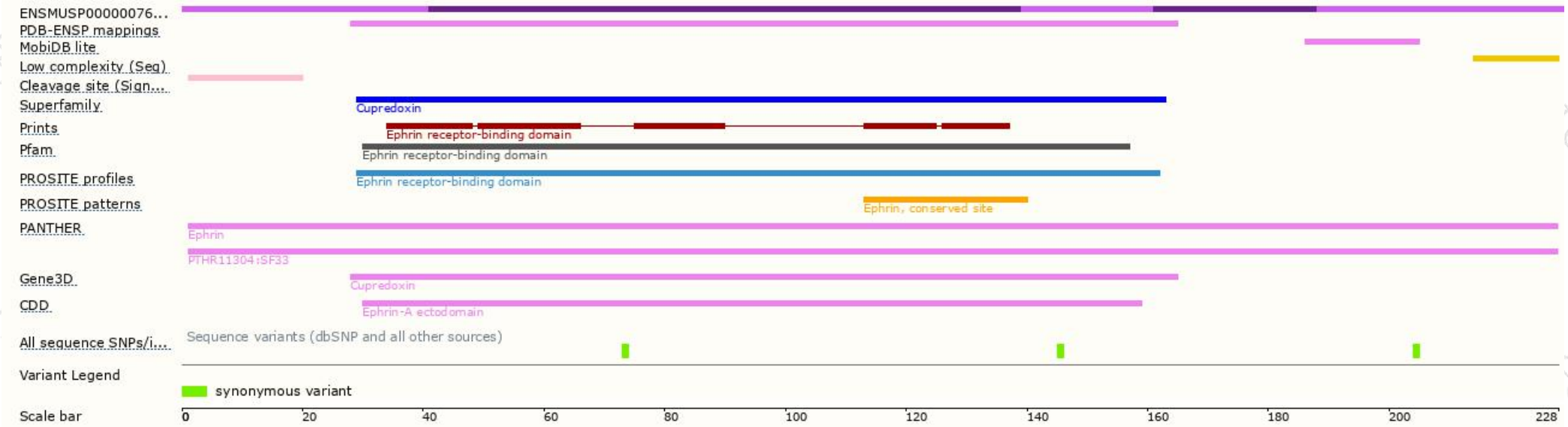
The strategy is based on the design of *Efna5-201* transcript,The transcription is shown below



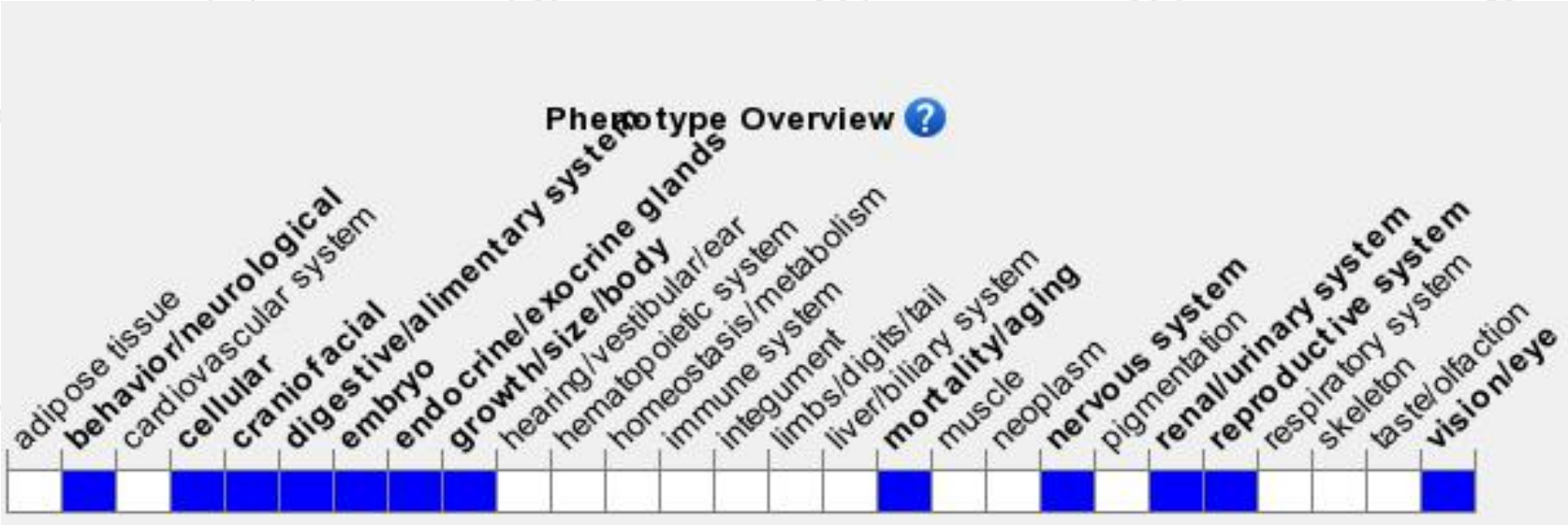
Genomic location distribution



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/).

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

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