

Efna5 Cas9-CKO Strategy

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Design Date:

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Project Overview

Project Name

Efna5

Project type

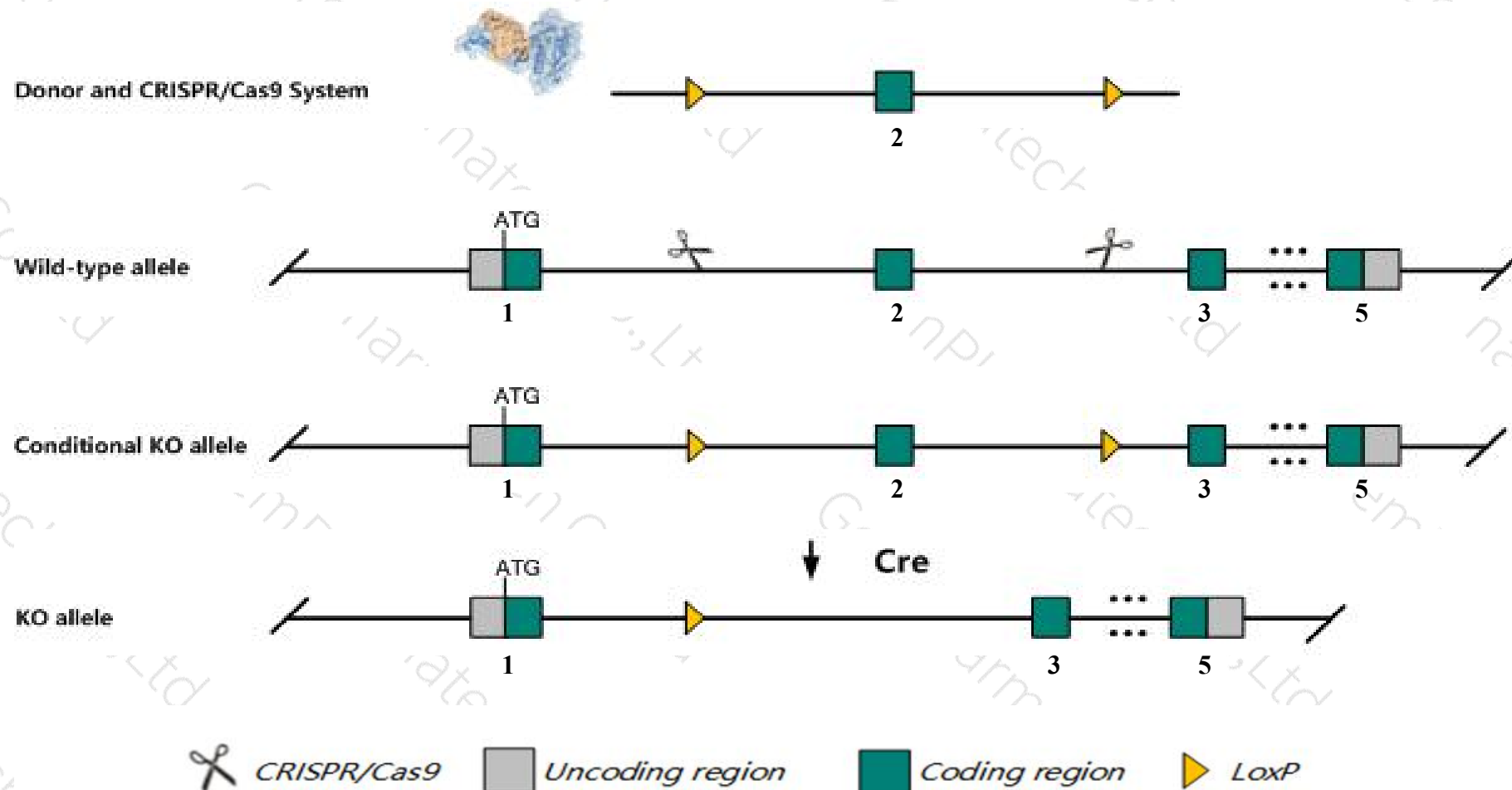
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

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



- 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 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, 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at existing technological level.

Gene information (NCBI)



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

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

Summary

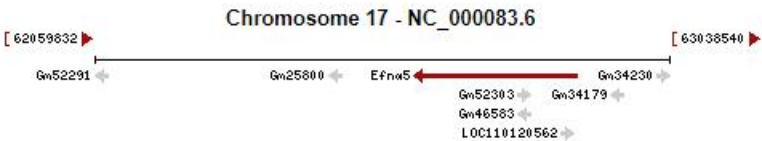
- Official Symbol** Efna5 provided by [MGI](#)
- Official Full Name** ephrin A5 provided by [MGI](#)
- Primary source** [MGI:MGI:107444](#)
- See related** [Ensembl:ENSMUSG00000048915](#)
- Gene type** protein coding
- RefSeq status** VALIDATED
- Organism** [Mus musculus](#)
- Lineage** Eukaryota; Metazoa; 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)

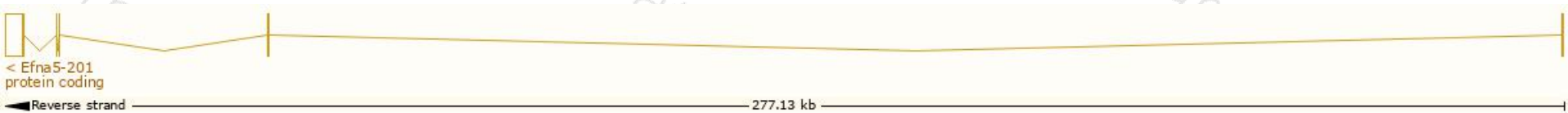


Transcript information (Ensembl)

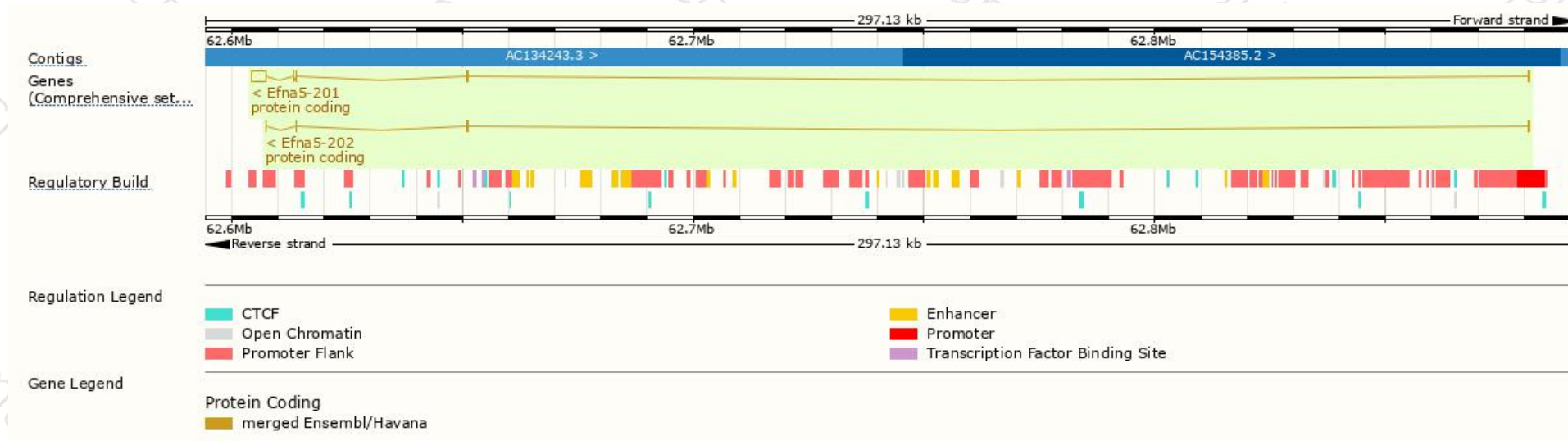
The gene has 2 transcripts,all transcripts are shown below:

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

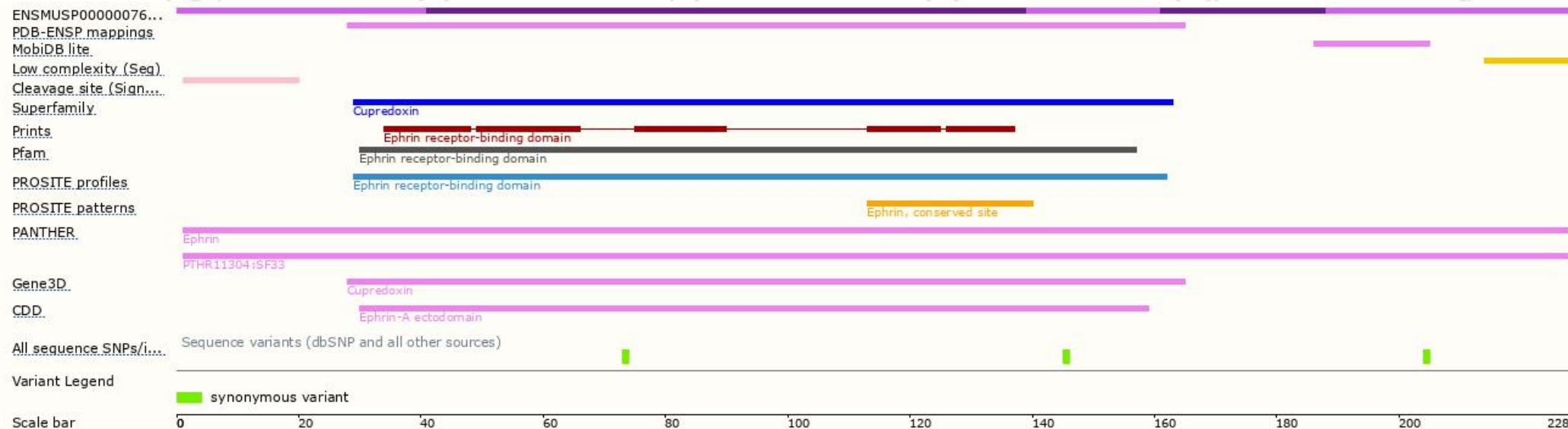
The strategy is based on the design of *Efna5-201* transcript,The transcription is shown below



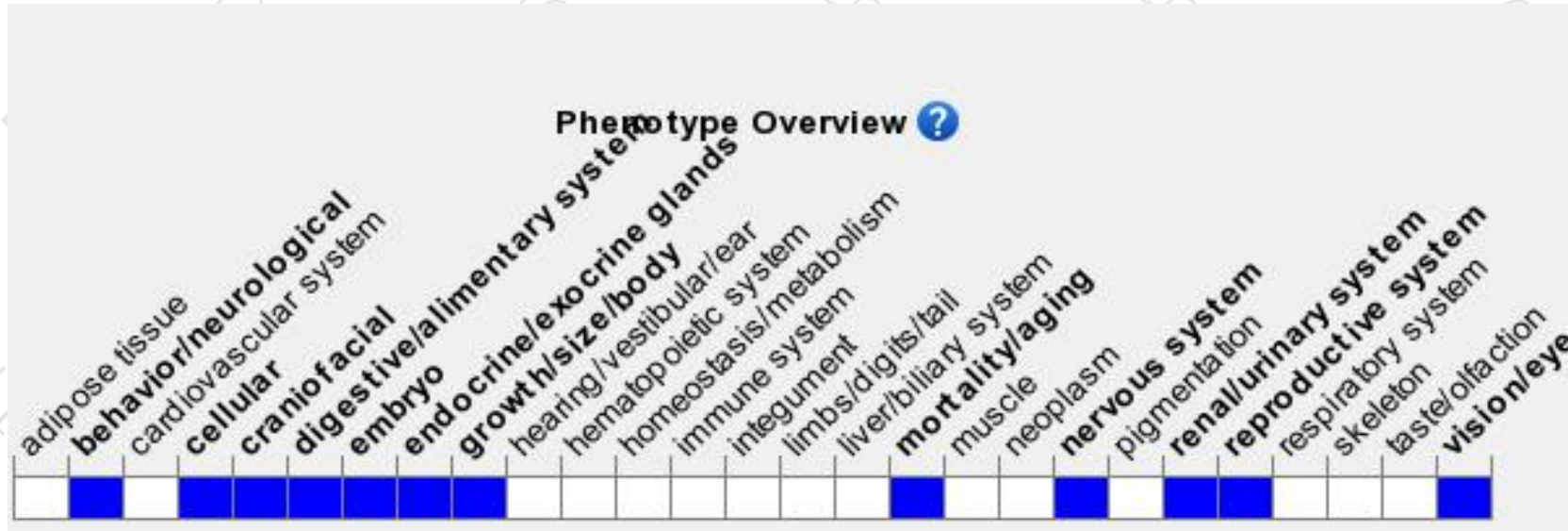
Genomic location distribution



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/>).

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.

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

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