

Opn5 Cas9-CKO Strategy

Designer:

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Design Date:

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Project Overview

Project Name

Opn5

Project type

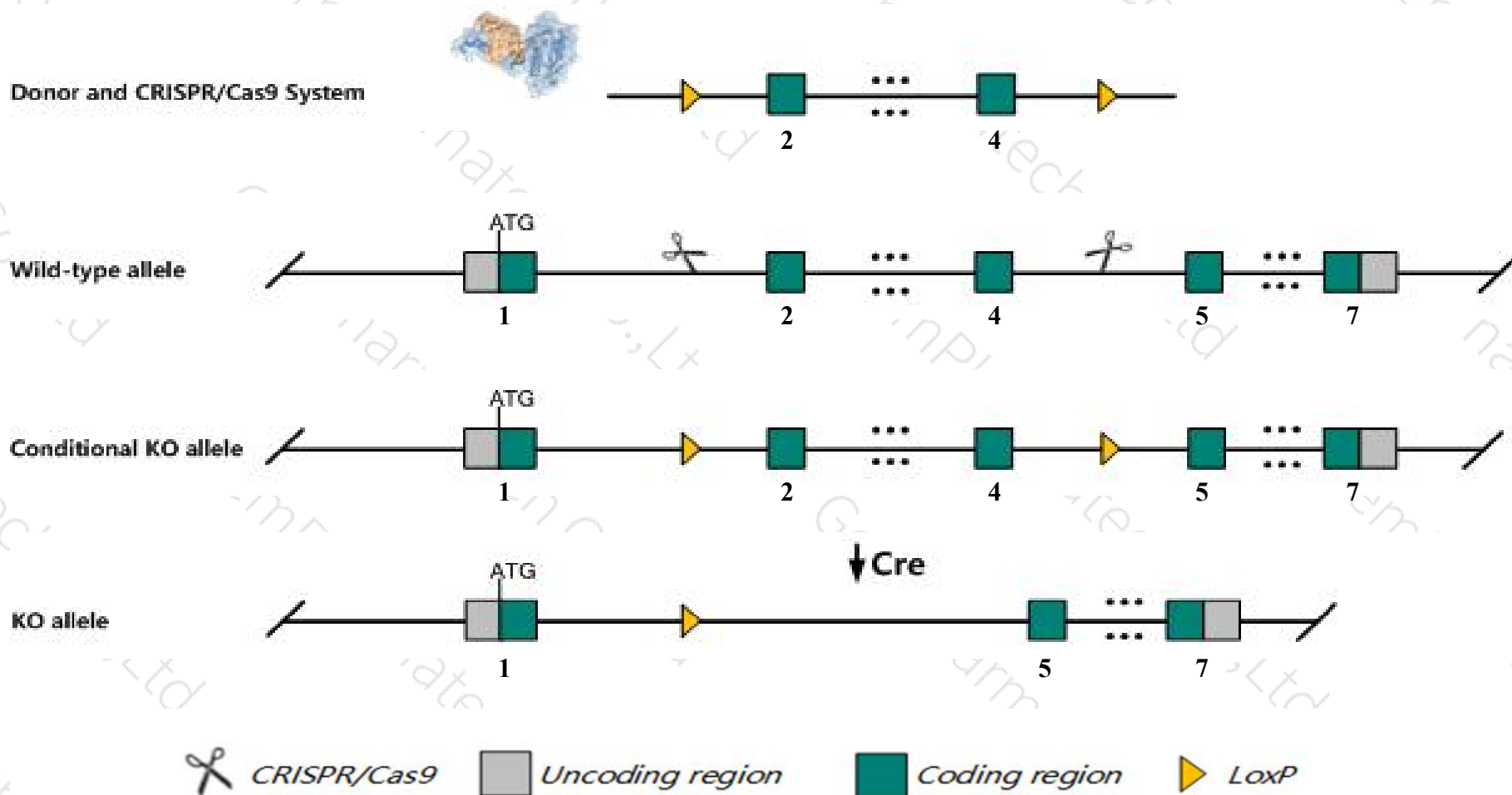
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Opn5* gene. The schematic diagram is as follows:



- The *Opn5* gene has 1 transcript. According to the structure of *Opn5* gene, exon2-exon4 of *Opn5-201* (ENSMUST00000068355.7) transcript is recommended as the knockout region. The region contains 626bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Opn5* gene. The brief process is as follows: gRNA was transcribed in vitro, donor was constructed. Cas9, gRNA 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, Mice homozygous for a knock-out allele fail to exhibit light/dark entrainment.
- The *Opn5* 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)

Opn5 opsin 5 [Mus musculus (house mouse)]

Gene ID: 353344, updated on 31-Jan-2019

Summary



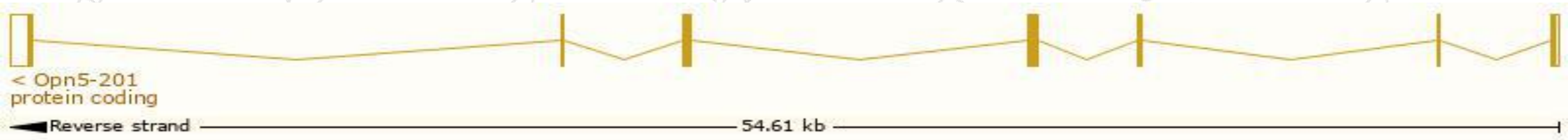
Official Symbol	Opn5 provided by MGI
Official Full Name	opsin 5 provided by MGI
Primary source	MGI:MGI:2662912
See related	Ensembl:ENSMUSG00000043972
Gene type	protein coding
RefSeq status	PROVISIONAL
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Gpr136, Neuropsin, PGR12, TMEM13
Expression	Low expression observed in reference dataset See more
Orthologs	human all

Transcript information (Ensembl)

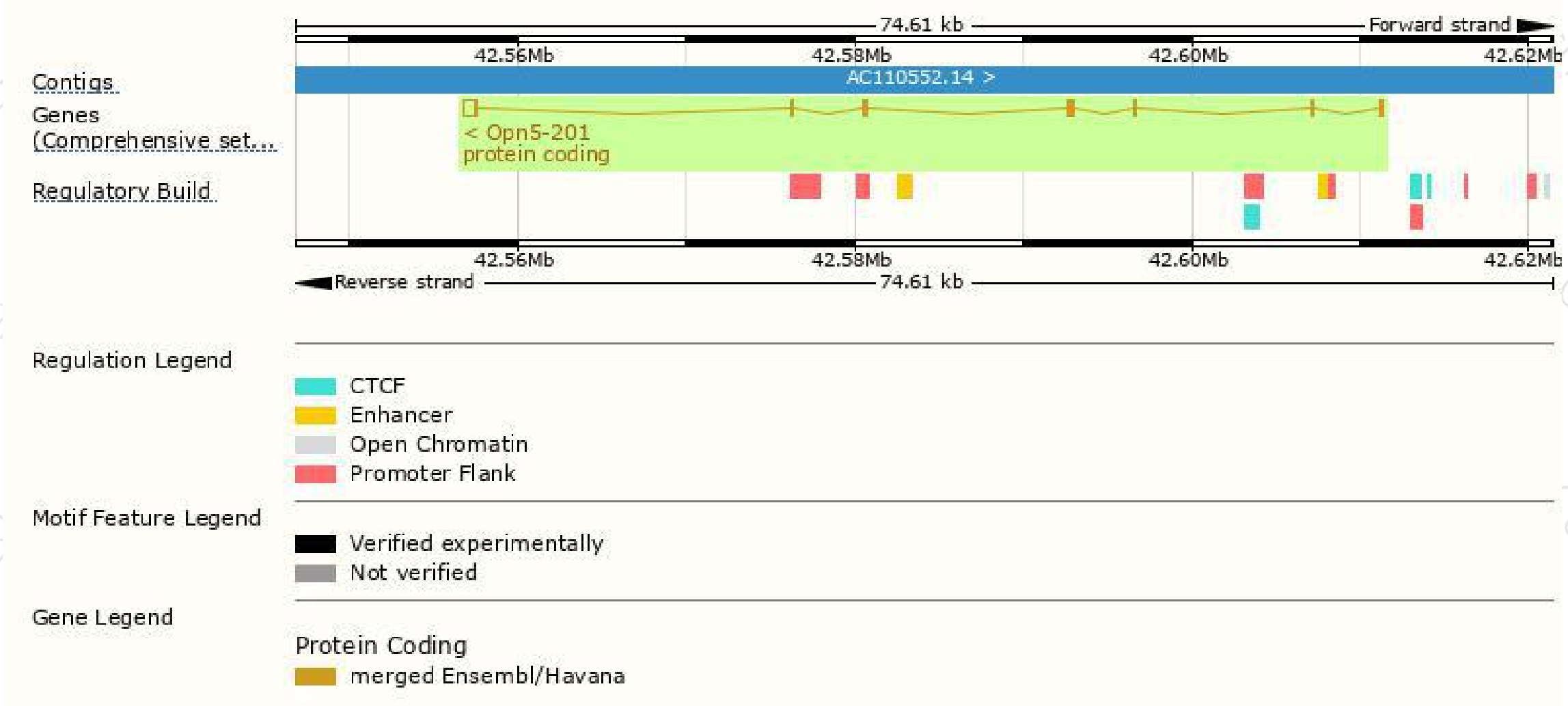
The gene has 1 transcript, and the transcript is shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Opn5-201	ENSMUST00000068355.7	1906	377aa	Protein coding	CCDS37619	Q6VZZ7	TSL:1 GENCODE basic APPRIS P1

The strategy is based on the design of *Opn5-201* transcript, The transcription is shown below



Genomic location distribution



Protein domain

ENSMUSP00000063...

Transmembrane heli...

MobiDB lite

Low complexity (Seq)

Conserved Domains

hmmpanther

PTHR24240:SF0

PTHR24240

Superfamily domains

SSF81321

Prints domain

Peropsin

Pfam domain

G protein-coupled receptor, rhodopsin-like

G protein-coupled receptor, rhodopsin-like

PROSITE profiles

GPCR, rhodopsin-like, 7TM

PROSITE patterns

G protein-coupled receptor, rhodopsin-like

Visual pigments (opsins) retinal

Gene3D

1.20.1070.10

All sequence SNPs/i...

Sequence variants (dbSNP and all other sources)

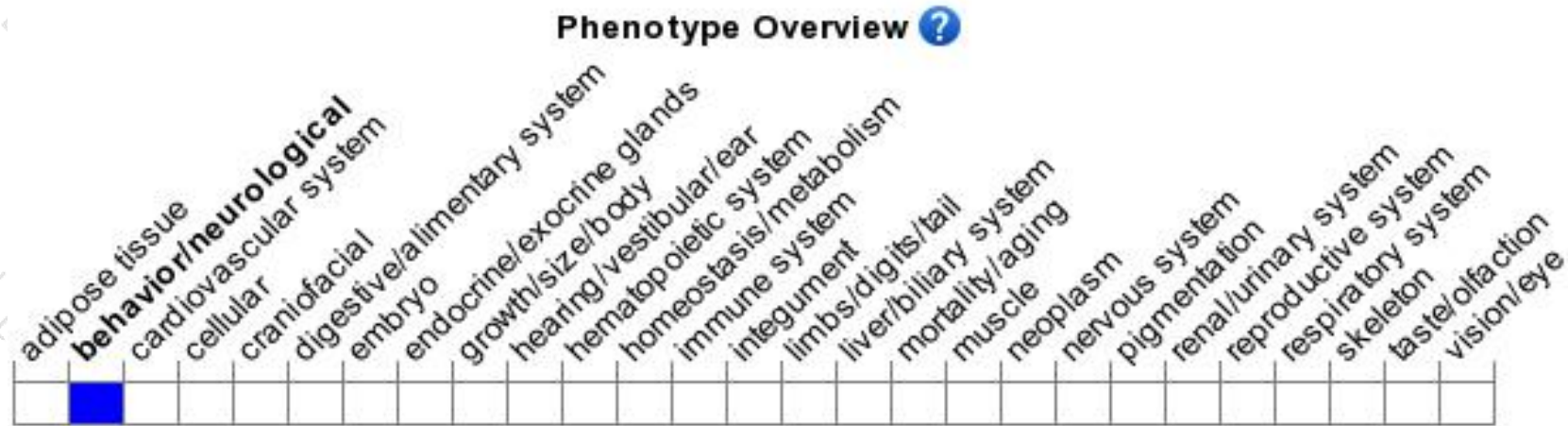
Variant Legend

 synonymous variant

Scale bar

0 40 80 120 160 200 240 280 320 377

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, Mice homozygous for a knock-out allele fail to exhibit light/dark entrainment.

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

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