

Rem2 Cas9-CKO Strategy

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Reviewer:

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Project Overview

Project Name

Rem2

Project type

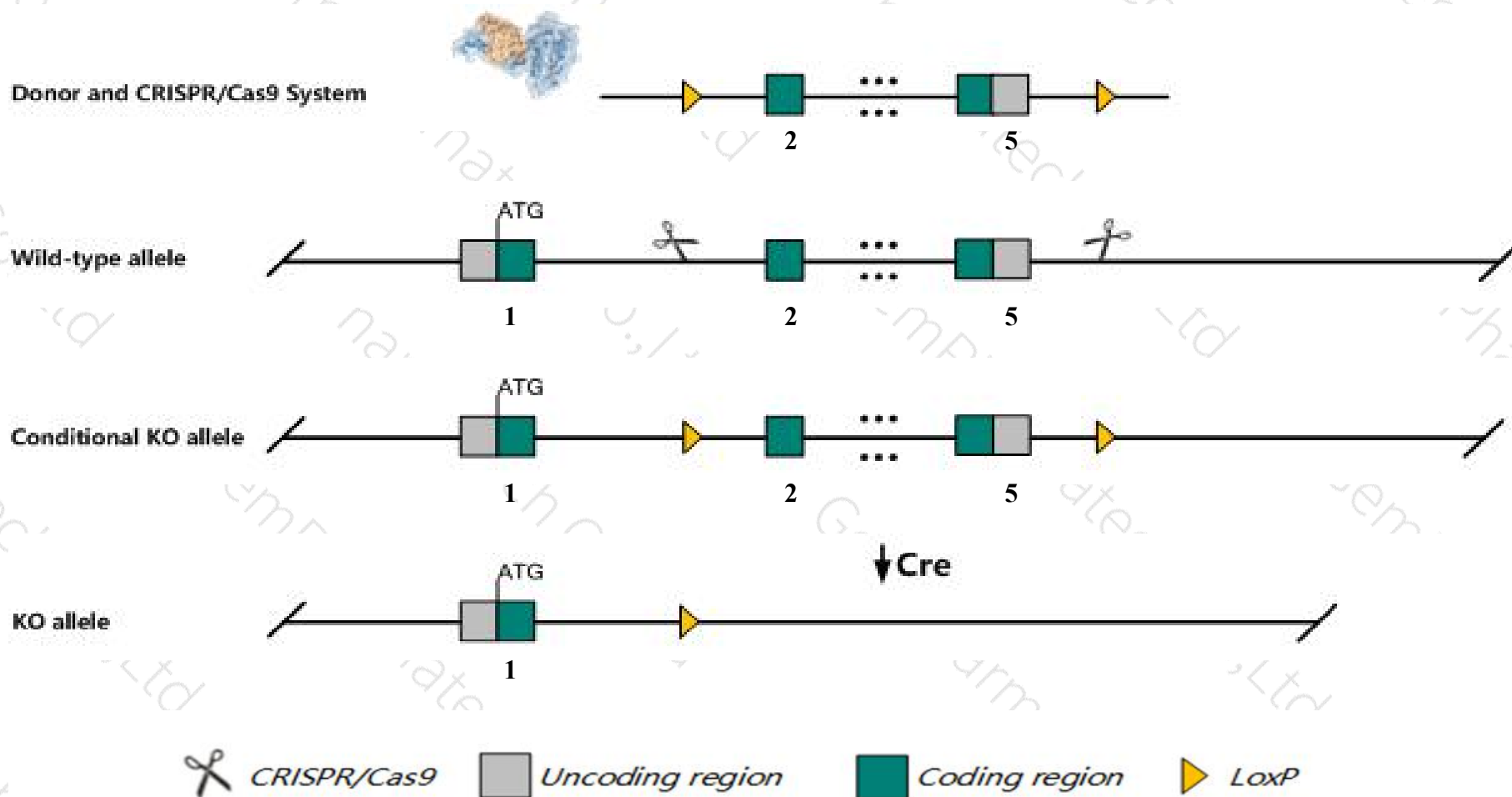
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Rem2* gene. The schematic diagram is as follows:



- The *Rem2* gene has 4 transcripts. According to the structure of *Rem2* gene, exon2-exon5 of *Rem2*-202 (ENSMUST00000164766.7) transcript is recommended as the knockout region. The region contains 923bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Rem2* 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, Mice homozygous for a knock-out allele exhibit strain-specific impaired viability and fertility as well as altered intrinsic excitability and spontaneous firing in visual circuits.
- The *Rem2* gene is located on the Chr14. 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)

Rem2 rad and gem related GTP binding protein 2 [*Mus musculus* (house mouse)]

Gene ID: 140743, updated on 13-Mar-2020

Summary

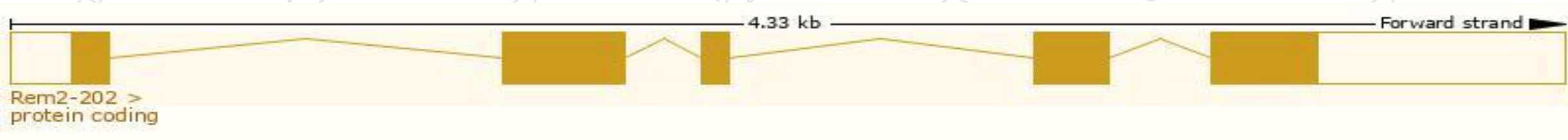
Official Symbol	Rem2 provided by MGI
Official Full Name	rad and gem related GTP binding protein 2 provided by MGI
Primary source	MGI:MGI:2155260
See related	Ensembl:ENSMUSG00000022176
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	AW411893
Expression	Biased expression in whole brain E14.5 (RPKM 7.7), CNS E14 (RPKM 6.4) and 9 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

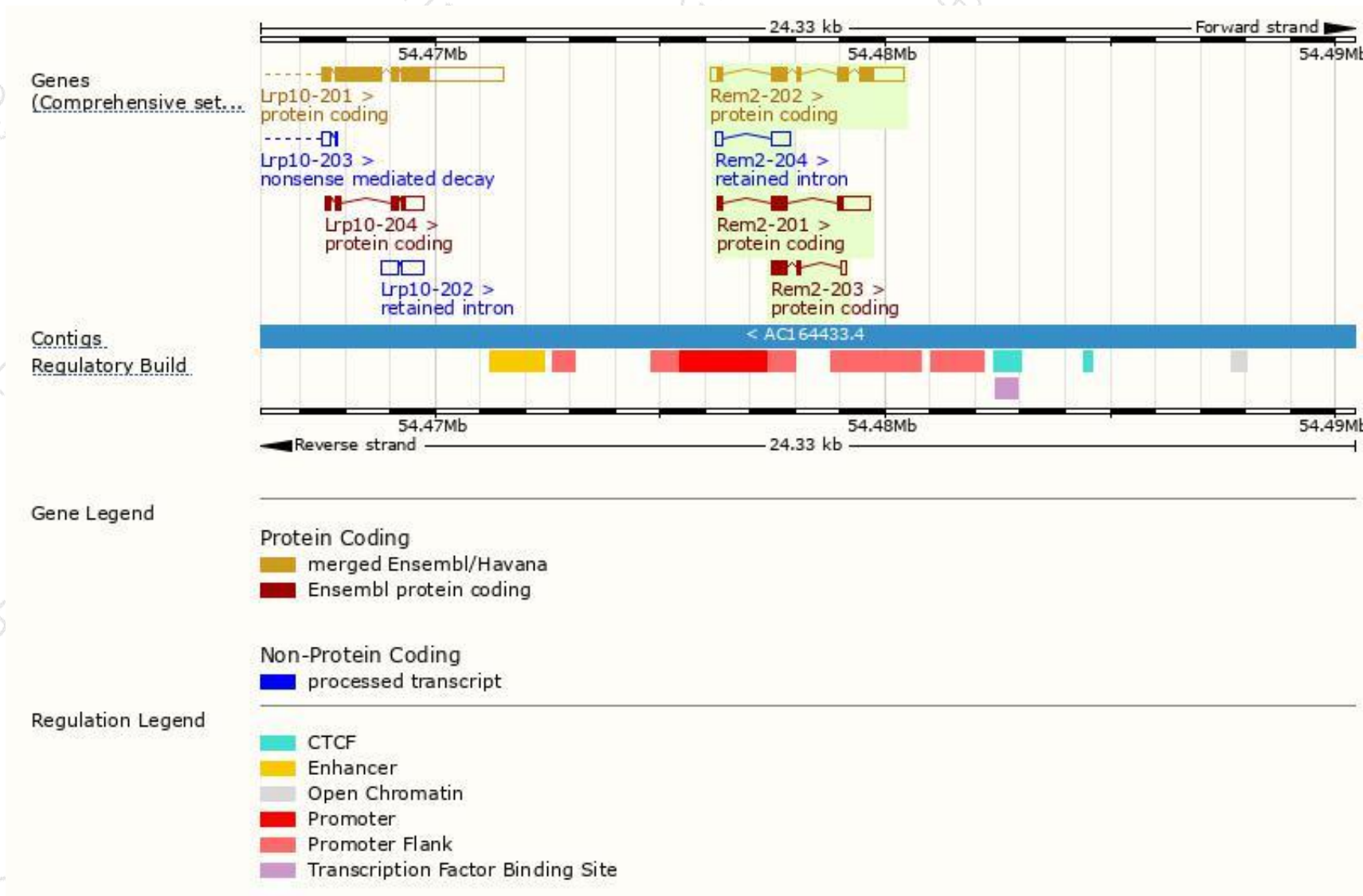
The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Rem2-202	ENSMUST00000164766.7	1884	341aa	Protein coding	CCDS27090	E9Q4D5	TSL:1 GENCODE basic APPRIS P1
Rem2-201	ENSMUST00000164697.7	1194	180aa	Protein coding	-	E9PVZ0	TSL:5 GENCODE basic
Rem2-203	ENSMUST00000168930.1	513	140aa	Protein coding	-	F6Z0Z5	CDS 5' incomplete TSL:5
Rem2-204	ENSMUST00000170337.1	556	No protein	Retained intron	-	-	TSL:3

The strategy is based on the design of *Rem2-202* transcript,The transcription is shown below



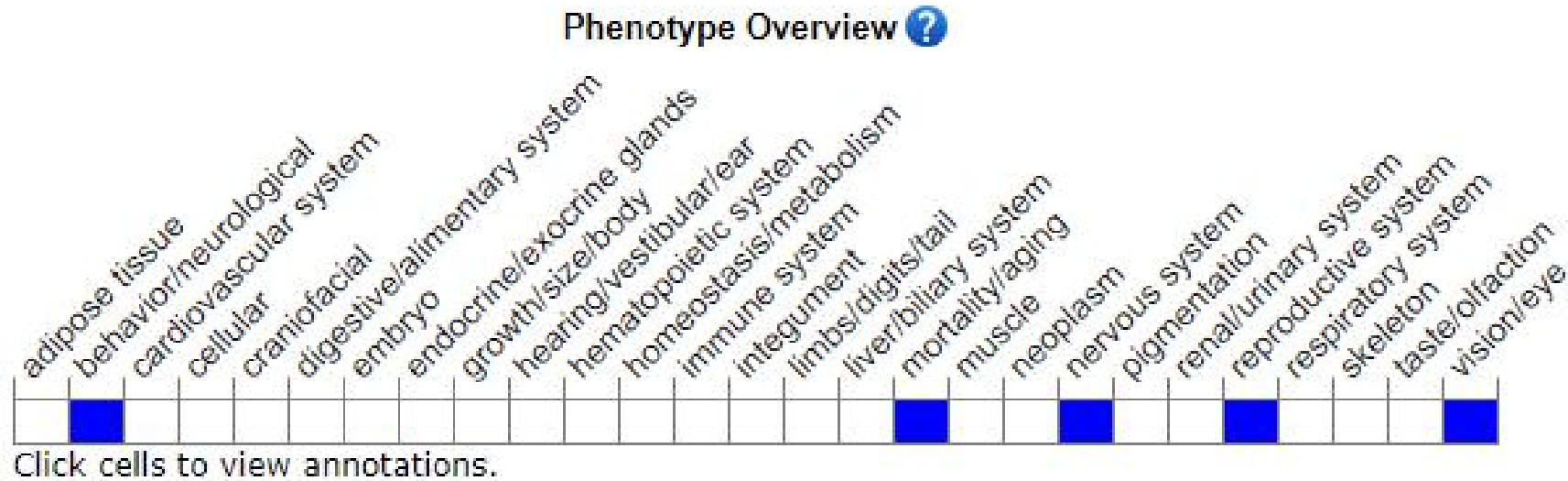
Genomic location distribution



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, Mice homozygous for a knock-out allele exhibit strain-specific impaired viability and fertility as well as altered intrinsic excitability and spontaneous firing in visual circuits.

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

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