

Actr2 Cas9-CKO Strategy

Designer:

Yang Zeng

Reviewer:

Yanhua Shen

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Project Overview

Project Name

Actr2

Project type

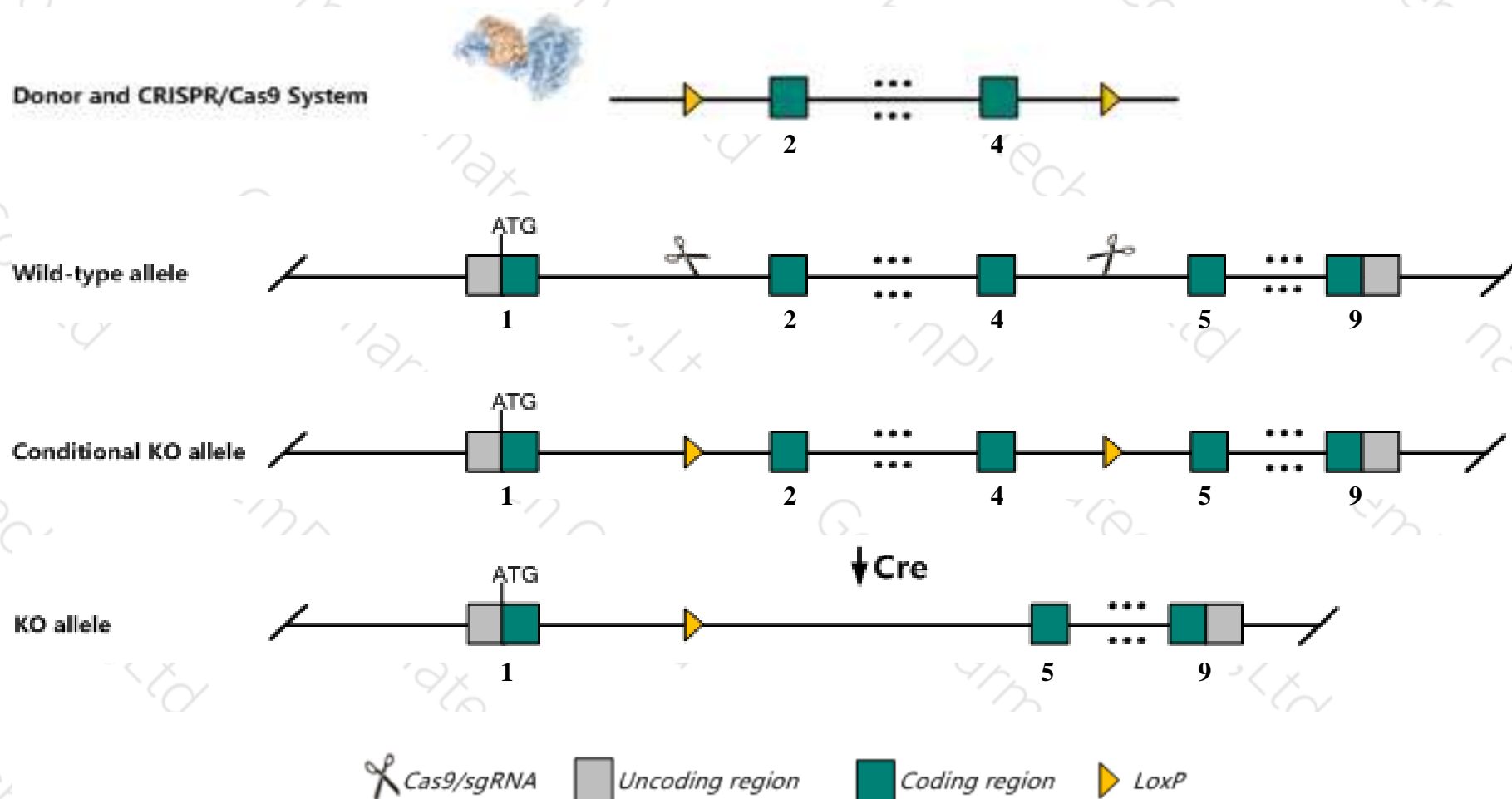
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Actr2* gene. The schematic diagram is as follows:



- The *Actr2* gene has 3 transcripts. According to the structure of *Actr2* gene, exon2-exon4 of *Actr2-201* (ENSMUST00000000137.7) transcript is recommended as the knockout region. The region contains 400bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Actr2* gene. The brief process is as follows: sgRNA was transcribed in vitro, donor vector was constructed. Cas9, sgRNA 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 was 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 heterozygous for this mutation exhibit modified lethality associated with F5 null Tfp1 heterozygous mice.
- The *Actr2* gene is located on the Chr11. 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.

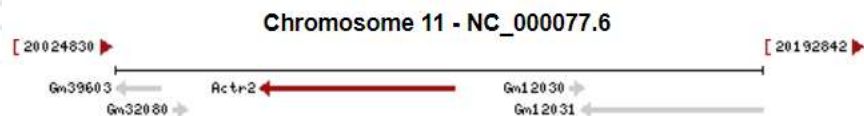
Gene information (NCBI)

Actr2 ARP2 actin-related protein 2 [*Mus musculus* (house mouse)]

Gene ID: 66713, updated on 27-Aug-2019

Summary

Official Symbol	Actr2 provided by MGI
Official Full Name	ARP2 actin-related protein 2 provided by MGI
Primary source	MGI:MGI:1913963
See related	Ensembl:ENSMUSG00000020152
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	Arp2; AA409782; D6Ert746e; 4921510D23Rik
Expression	Ubiquitous expression in placenta adult (RPKM 51.3), CNS E18 (RPKM 43.4) and 25 other tissues See more
Orthologs	human all

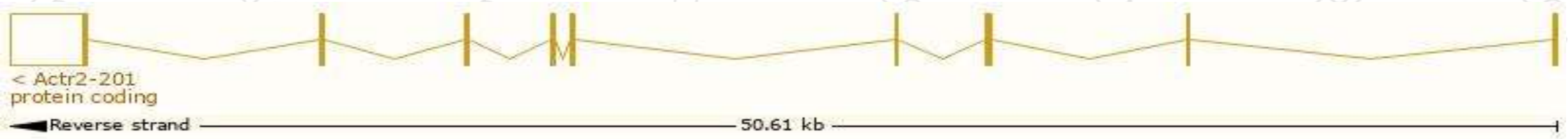


Transcript information (Ensembl)

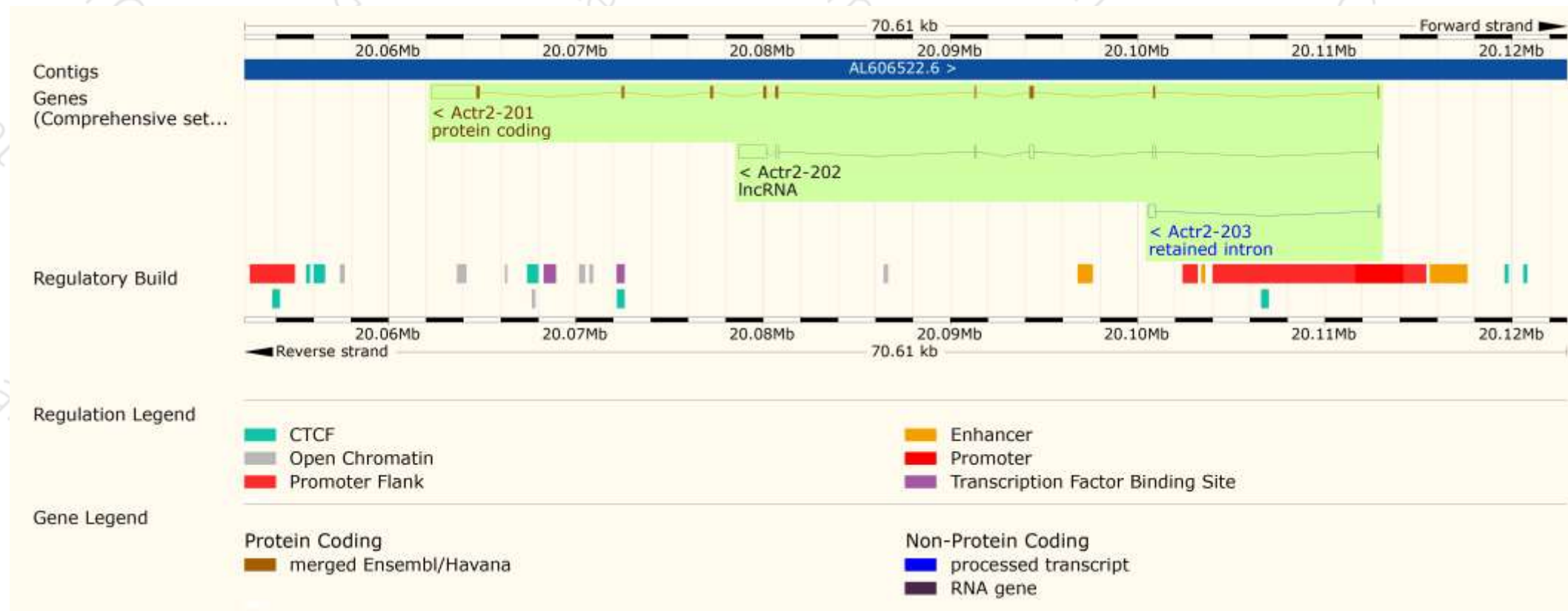
The gene has 3 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Translation ID	Biotype	CCDS	UniProt	Flags
Actr2-201	ENSMUST00000000137.7	3631	394aa	ENSMUSP00000000137.7	Protein coding	CCDS24455	P61161 Q5SW83	TSL:1 GENCODE basic APPRIS P1
Actr2-203	ENSMUST00000134779.1	452	No protein	-	Retained intron	-	-	TSL:2
Actr2-202	ENSMUST00000132022.1	2087	No protein	-	lncRNA	-	-	TSL:1

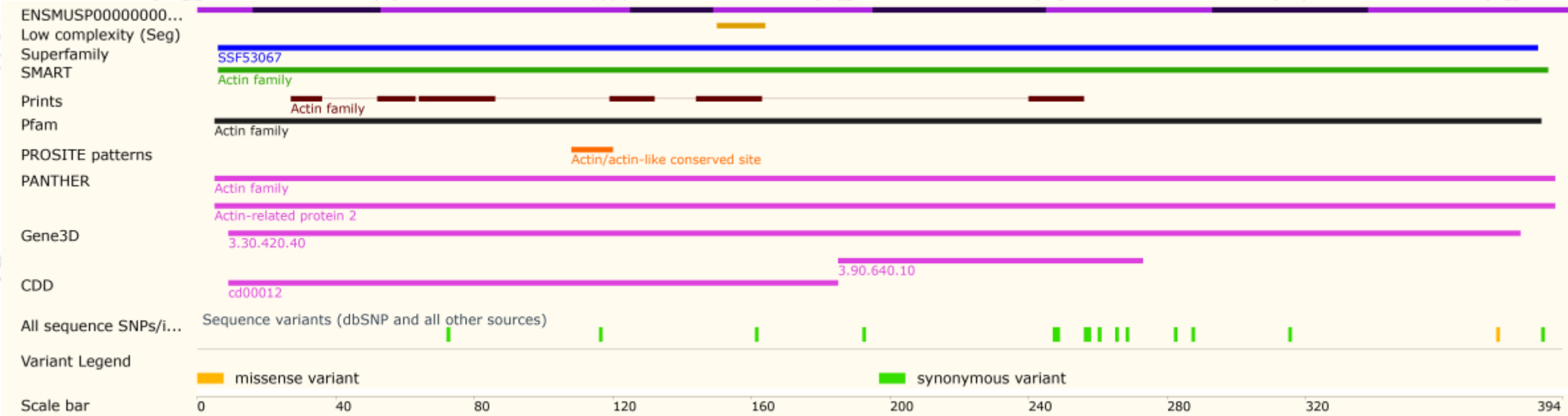
The strategy is based on the design of *Actr2-201* transcript,The transcription is shown below



Genomic location distribution



Protein domain



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

Tel: 025-5864 1534

