

Acvr2a Cas9-KO Strategy

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Project Overview

Project Name

Acvr2a

Project type

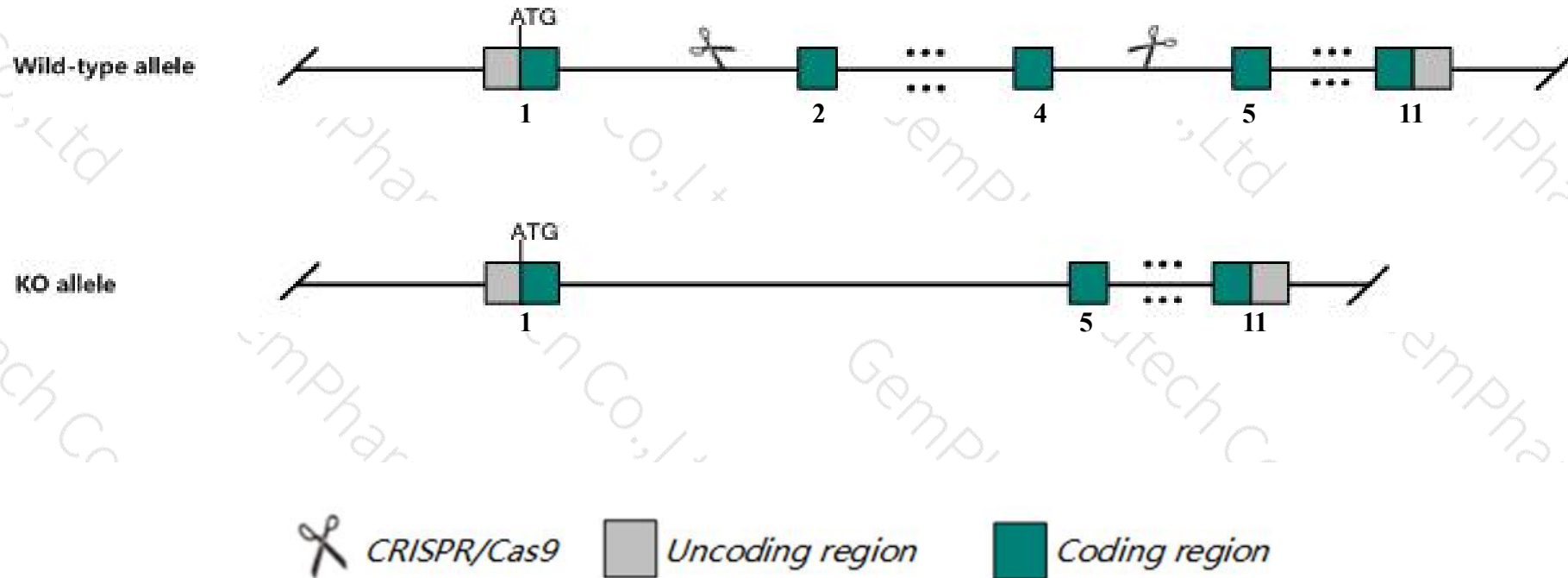
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Acvr2a* gene. The schematic diagram is as follows:



- The *Acvr2a* gene has 2 transcripts. According to the structure of *Acvr2a* gene, exon2-exon4 of *Acvr2a-201* (ENSMUST00000063886.3) transcript is recommended as the knockout region. The region contains 473bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Acvr2a* gene. The brief process is as follows: gRNA was transcribed in vitro. Cas9 and gRNA 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.

- According to the existing MGI data, While most mice homozygous for targeted mutations that inactivate this gene appear normal, a few display skeletal and facial abnormalities. As adults, follicle-stimulating hormone is suppressed, affecting reproduction.
- Transcript *Acvr2a*-202 may not be affected.
- The *Acvr2a* gene is located on the Chr2. 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)

Acvr2a activin receptor IIA [*Mus musculus* (house mouse)]

Gene ID: 11480, updated on 10-Oct-2019

Summary

Official Symbol Acvr2a provided by [MGI](#)
Official Full Name activin receptor IIA provided by [MGI](#)
Primary source [MGI:MGI:102806](#)
See related [Ensembl:ENSMUSG00000052155](#)
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 Acvr2; Actrla; Tactrl
Expression Broad expression in CNS E18 (RPKM 16.6), whole brain E14.5 (RPKM 12.4) and 25 other tissues [See more](#)
Orthologs [human](#) [all](#)

Genomic context

Location: 2 C1.1; 2 28.38 cM

See Acvr2a in [Genome Data Viewer](#)

Exon count: 12

Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	2	NC_000068.7 (48814109..48903264)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	2	NC_000068.6 (48669629..48758784)

Transcript information (Ensembl)

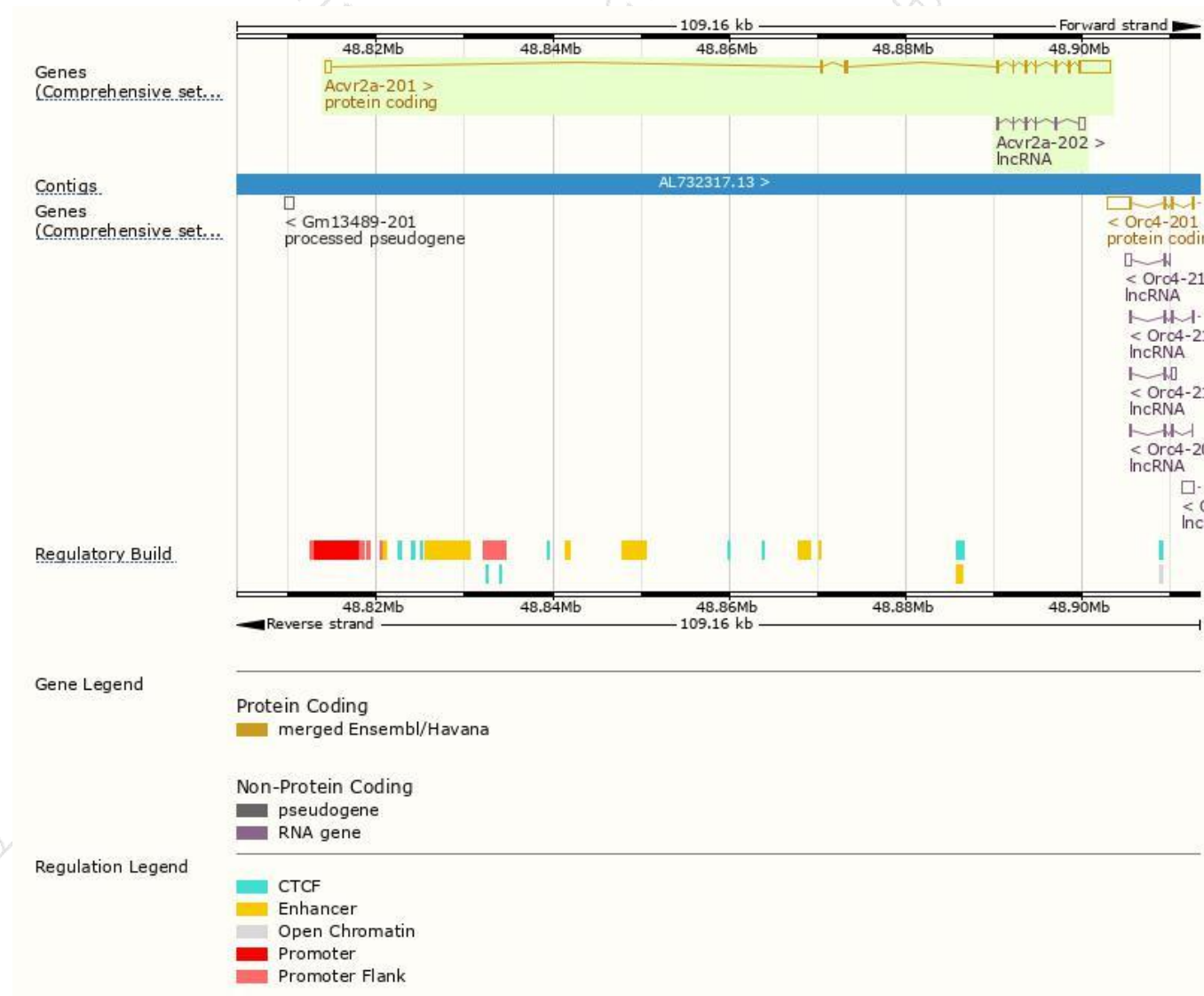
The gene has 2 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Acvr2a-201	ENSMUST00000063886.3	5686	513aa	Protein coding	CCDS16021	A2AI38 P27038	TSL:1 GENCODE basic APPRIS P1
Acvr2a-202	ENSMUST00000156681.1	1252	No protein	lncRNA	-	-	TSL:3

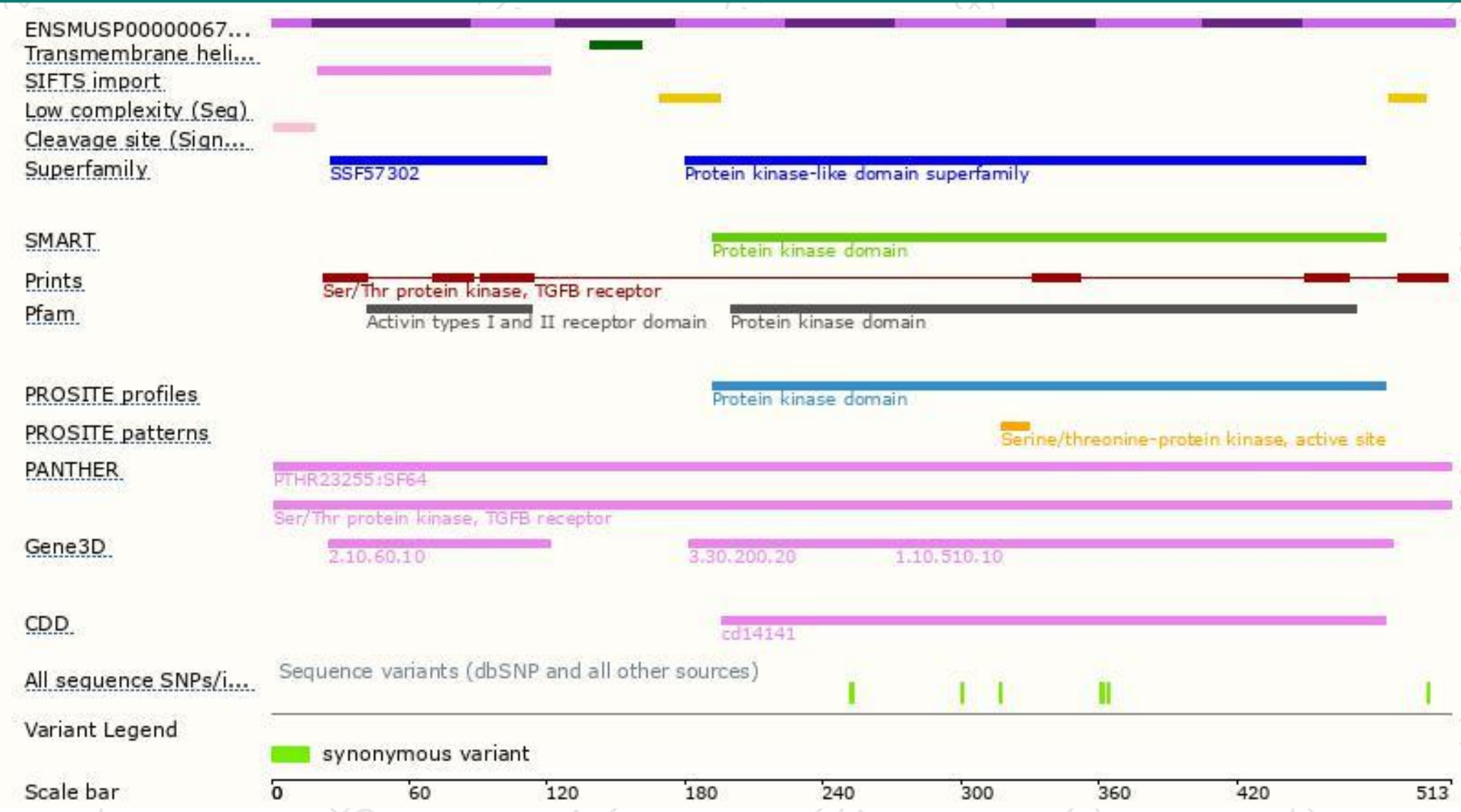
The strategy is based on the design of *Acvr2a-201* transcript,The transcription is shown below



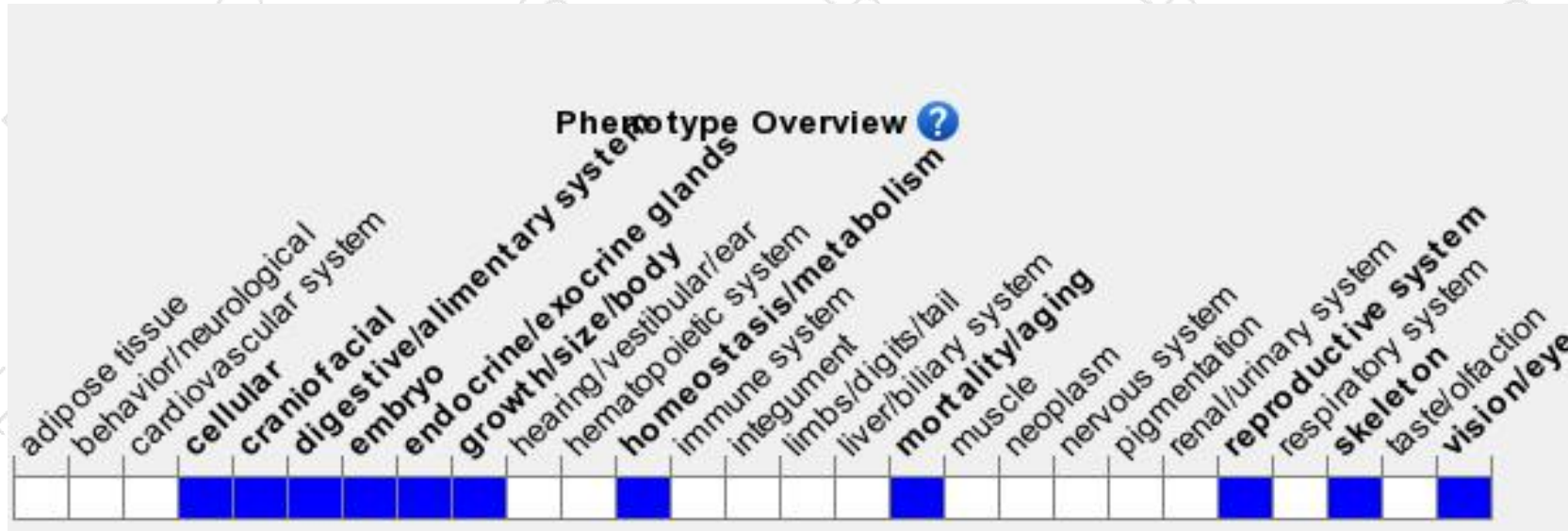
Genomic location distribution



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, While most mice homozygous for targeted mutations that inactivate this gene appear normal, a few display skeletal and facial abnormalities. As adults, follicle-stimulating hormone is suppressed, affecting reproduction.

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

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