

# *Arhgef15* Cas9-CKO Strategy

Designer:Lixin LYU  
Design Date:2019-8-12

# Project Overview

**Project Name**

*Arhgef15*

**Project type**

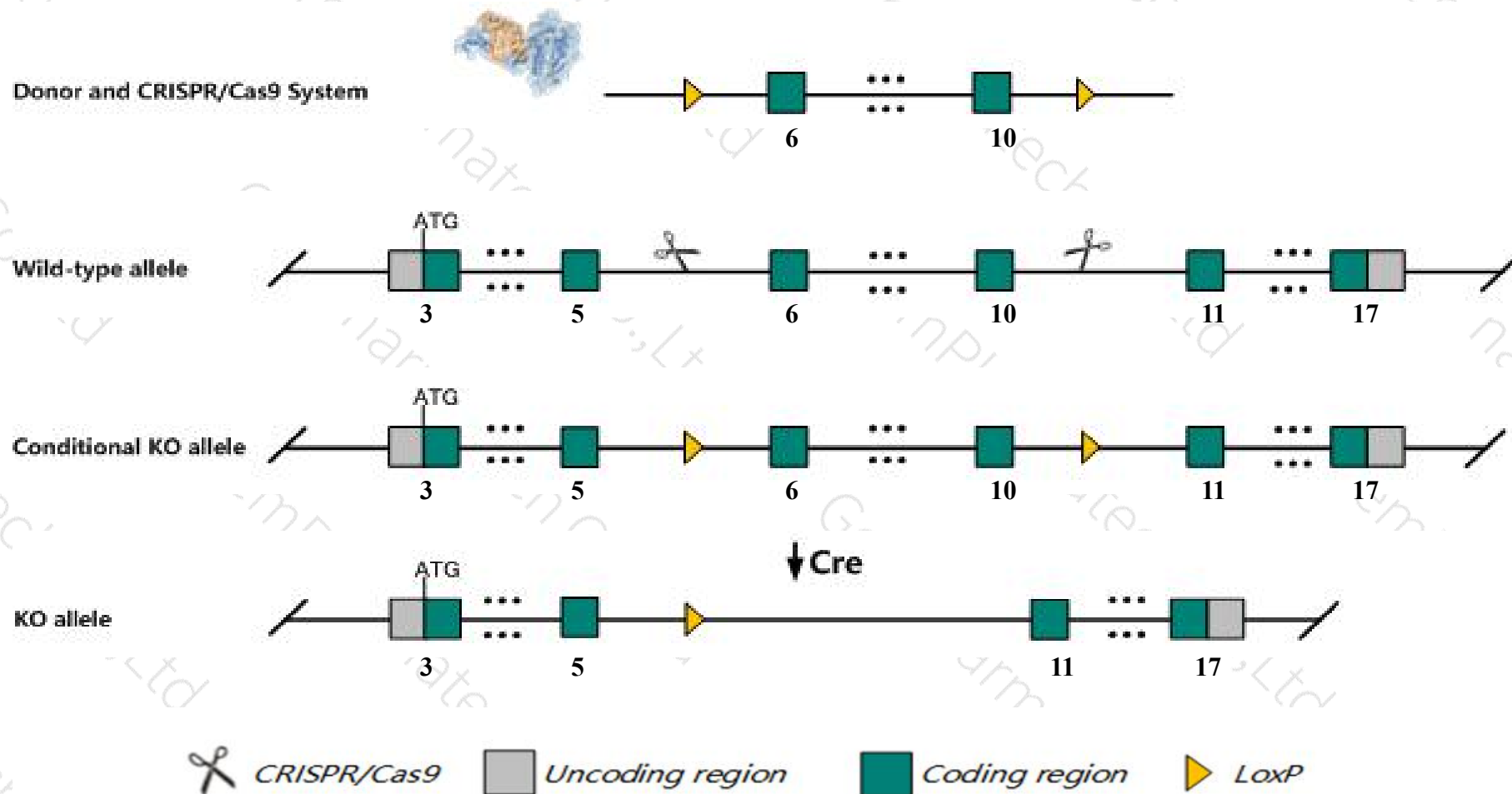
**Cas9-CKO**

**Strain background**

**C57BL/6JGpt**

# Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Arhgef15* gene. The schematic diagram is as follows:



- The *Arhgef15* gene has 6 transcripts. According to the structure of *Arhgef15* gene, exon4-exon8 of *Arhgef15-201* (ENSMUST00000065040.12) transcript is recommended as the knockout region. The region contains 715bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Arhgef15* 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 exhibit increased excitatory synapse formation. Mice homozygous for a knock-out allele exhibit delayed radial growth, sparse vasculature and empty basement membrane sleeves in the retina.
- Transcript *Arhgef15*-204&205&206 may not be affected.
- The *Arhgef15* 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)

## Arhgef15 Rho guanine nucleotide exchange factor (GEF) 15 [Mus musculus (house mouse)]

Gene ID: 442801, updated on 31-Jan-2019

### Summary



<b>Official Symbol</b>	Arhgef15 provided by <a href="#">MGI</a>
<b>Official Full Name</b>	Rho guanine nucleotide exchange factor (GEF) 15 provided by <a href="#">MGI</a>
<b>Primary source</b>	<a href="#">MGI:MGI:3045246</a>
<b>See related</b>	<a href="#">Ensembl:ENSMUSG00000052921</a>
<b>Gene type</b>	protein coding
<b>RefSeq status</b>	VALIDATED
<b>Organism</b>	<a href="#">Mus musculus</a>
<b>Lineage</b>	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
<b>Also known as</b>	D130071N09, D530030K12Rik, E5
<b>Expression</b>	Broad expression in lung adult (RPKM 39.8), adrenal adult (RPKM 12.1) and 15 other tissues <a href="#">See more</a>
<b>Orthologs</b>	<a href="#">human</a> <a href="#">all</a>

# Transcript information (Ensembl)

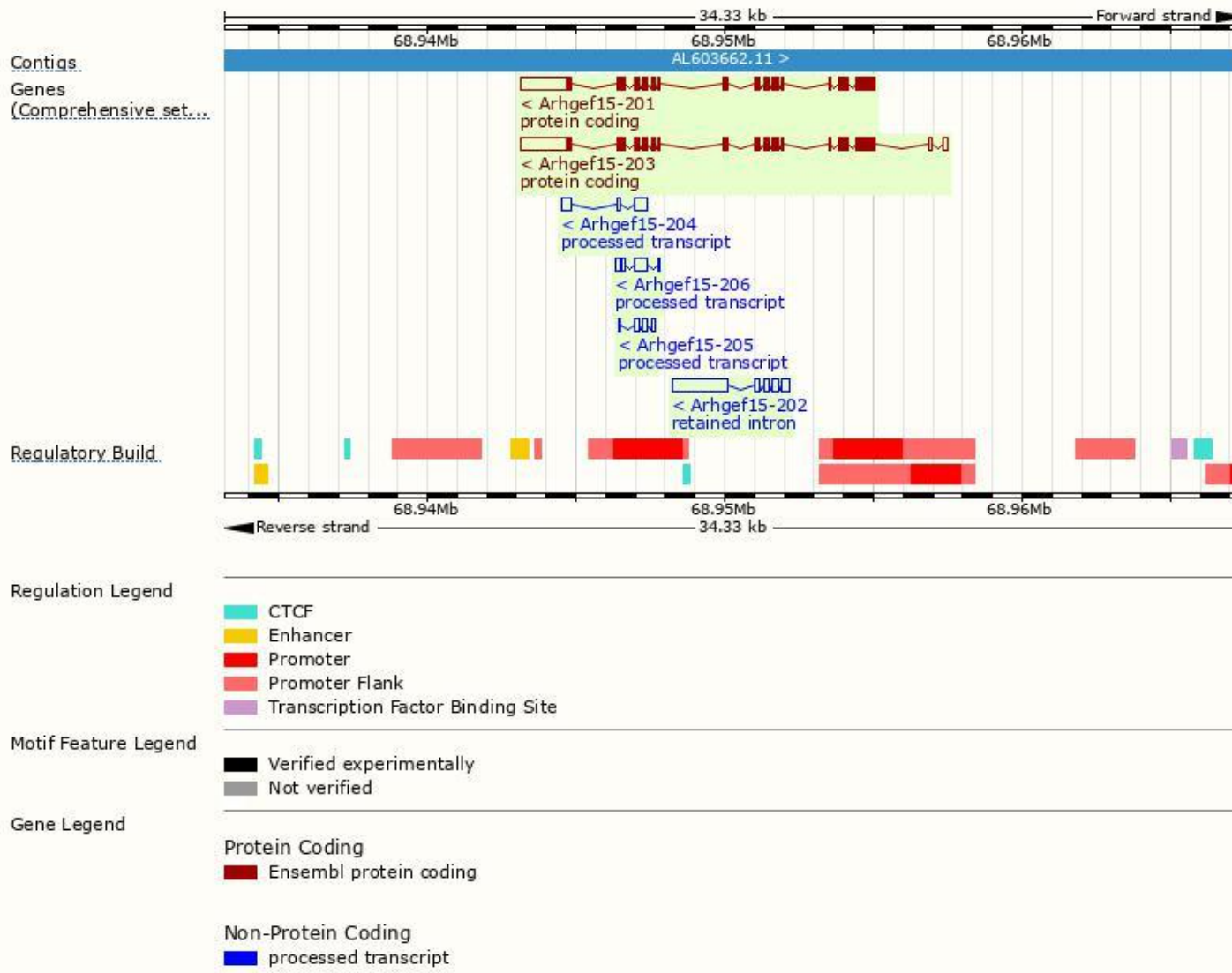
The gene has 6 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Arhgef15-203	<a href="#">ENSMUST00000108671.1</a>	4372	<a href="#">849aa</a>	Protein coding	<a href="#">CCDS24873</a>	<a href="#">Q5FWH6</a>	TSL:5 GENCODE basic APPRIS P1
Arhgef15-201	<a href="#">ENSMUST00000065040.12</a>	4123	<a href="#">849aa</a>	Protein coding	<a href="#">CCDS24873</a>	<a href="#">Q5FWH6</a>	TSL:5 GENCODE basic APPRIS P1
Arhgef15-204	<a href="#">ENSMUST00000131686.1</a>	805	No protein	Processed transcript	-	-	TSL:2
Arhgef15-206	<a href="#">ENSMUST00000151520.1</a>	726	No protein	Processed transcript	-	-	TSL:3
Arhgef15-205	<a href="#">ENSMUST00000141747.1</a>	428	No protein	Processed transcript	-	-	TSL:5
Arhgef15-202	<a href="#">ENSMUST00000108670.1</a>	2659	No protein	Retained intron	-	-	TSL:1

The strategy is based on the design of *Arhgef15-201* transcript,The transcription is shown below

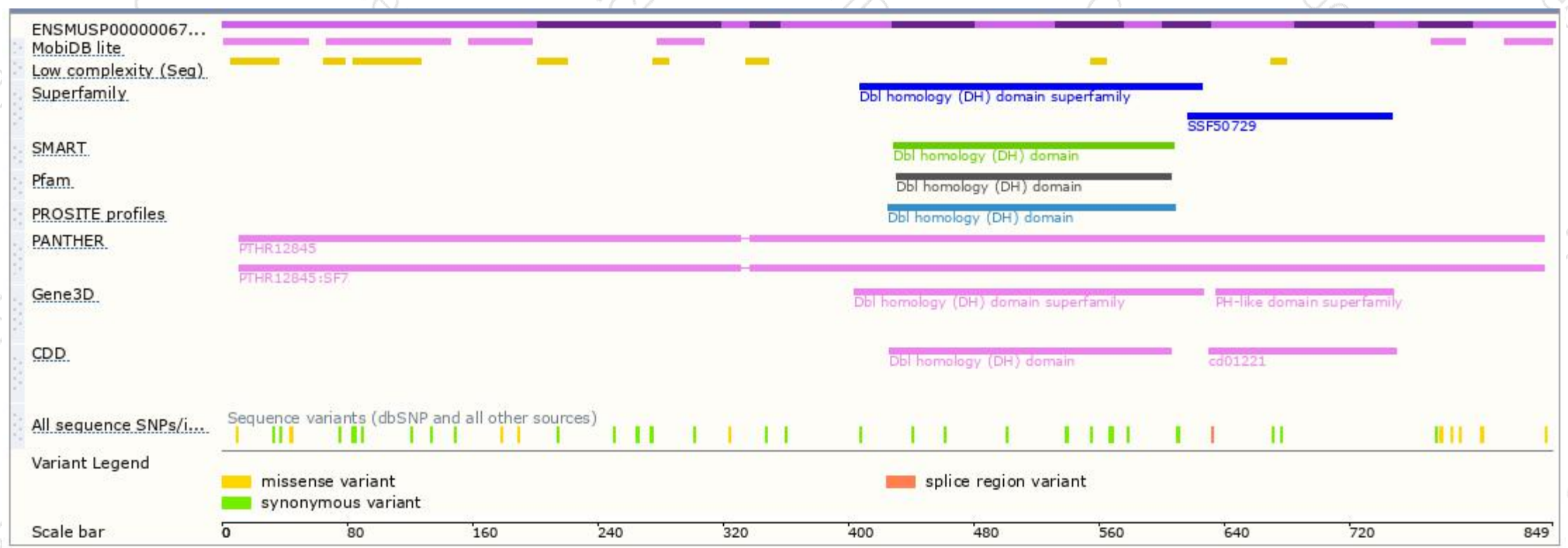


# Genomic location distribution

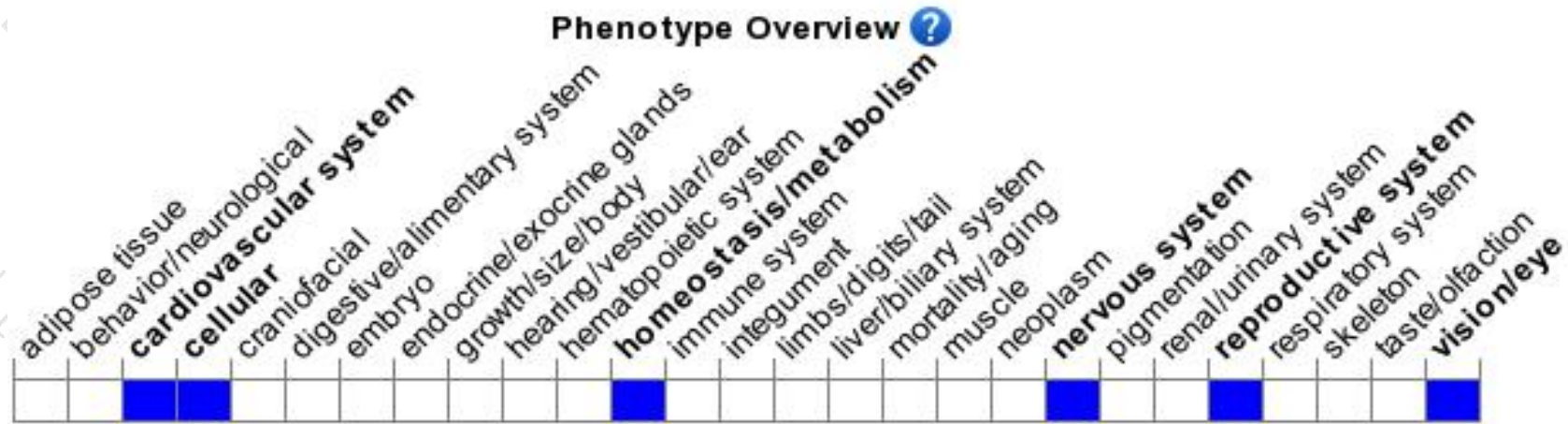




# Protein domain



# 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, Mice homozygous for a knock out allele exhibit increased excitatory synapse formation. Mice homozygous for a knock-out allele exhibit delayed radial growth, sparse vasculature and empty basement membrane sleeves in the retina.

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

Tel: 400-9660890

