

Arr3 Cas9-KO Strategy

Designer: Xueting Zhang

Reviewer: Yanhua Shen

Date: 2020-1-14

Project Overview

Project Name

Arr3

Project type

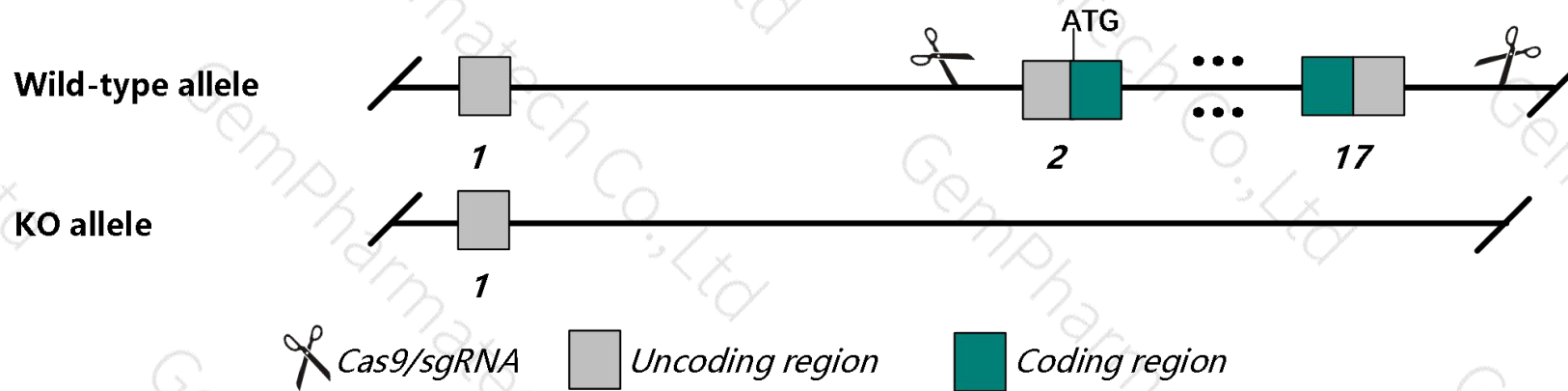
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Arr3* gene. The schematic diagram is as follows:



- The *Arr3* gene has 7 transcripts. According to the structure of *Arr3* gene, exon2-exon17 of *Arr3-201* (ENSMUST00000113769.7) transcript is recommended as the knockout region. The region contains all of the coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Arr3* gene. The brief process is as follows: CRISPR/Cas9 system v

- According to the existing MGI data, Mice homozygous for a null allele exhibit normal cone electrophysiology.
- The knockout region is near to the N-terminal of *Kif4* gene, this strategy may influence the regulatory function of the N-terminal of *Kif4* gene.
- The *Arr3* gene is located on the ChrX. 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)

Arr3 arrestin 3, retinal [*Mus musculus* (house mouse)]

Gene ID: 170735, updated on 11-Sep-2019

Summary

- Official Symbol** Arr3 provided by MGI
- Official Full Name** arrestin 3, retinal provided by MGI
- Primary source** MGI:MGI:2159617
- See related** Ensembl:ENSMUSG00000060890
- 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** Car; Arr4; Carr; Carfl
- Expression** Low expression observed in reference dataset [See more](#)
- Orthologs** [human](#) [all](#)

Genomic context

Location: X; X C3 See Arr3 in [Genome Data Viewer](#)

Exon count: 12

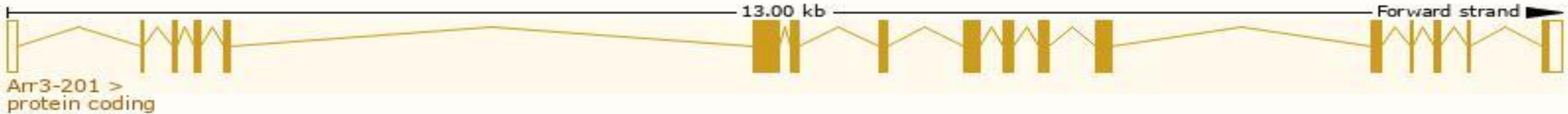
Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	X	NC_000086.7 (100605480..100618493)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	X	NC_000086.6 (97800836..97813832)

Transcript information (Ensembl)

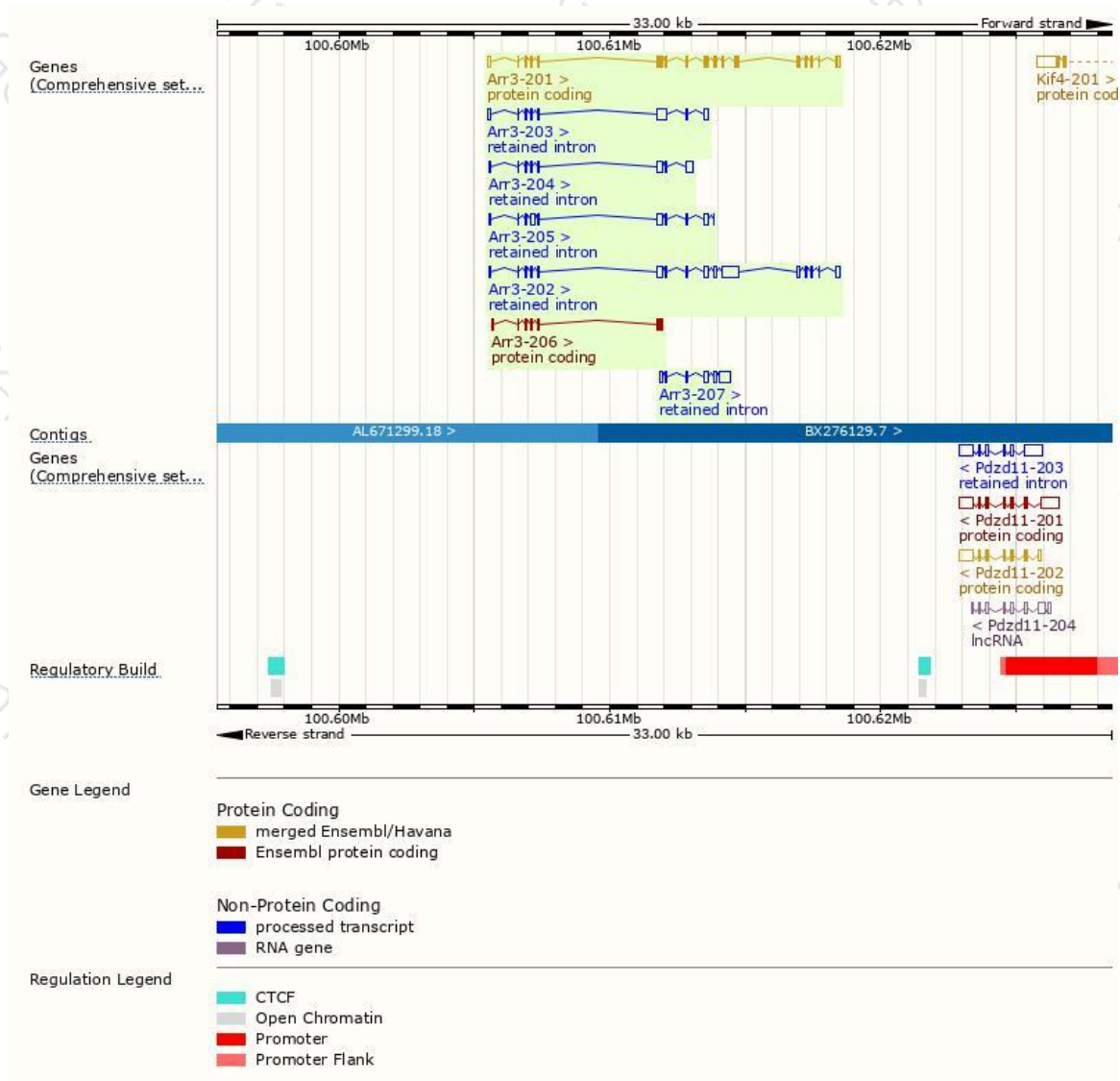
The gene has 7 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Arr3-201	ENSMUST00000113769.7	1359	381aa	Protein coding	CCDS41075	Q9EQP6	TSL:1 GENCODE basic APPRIS P1
Arr3-206	ENSMUST00000164940.1	423	115aa	Protein coding	-	E9PXD3	CDS 3' incomplete TSL:5
Arr3-202	ENSMUST00000131906.8	1692	No protein	Retained intron	-	-	TSL:2
Arr3-207	ENSMUST00000166688.1	882	No protein	Retained intron	-	-	TSL:3
Arr3-203	ENSMUST00000135237.8	794	No protein	Retained intron	-	-	TSL:5
Arr3-205	ENSMUST00000154771.7	774	No protein	Retained intron	-	-	TSL:5
Arr3-204	ENSMUST00000141676.8	749	No protein	Retained intron	-	-	TSL:5

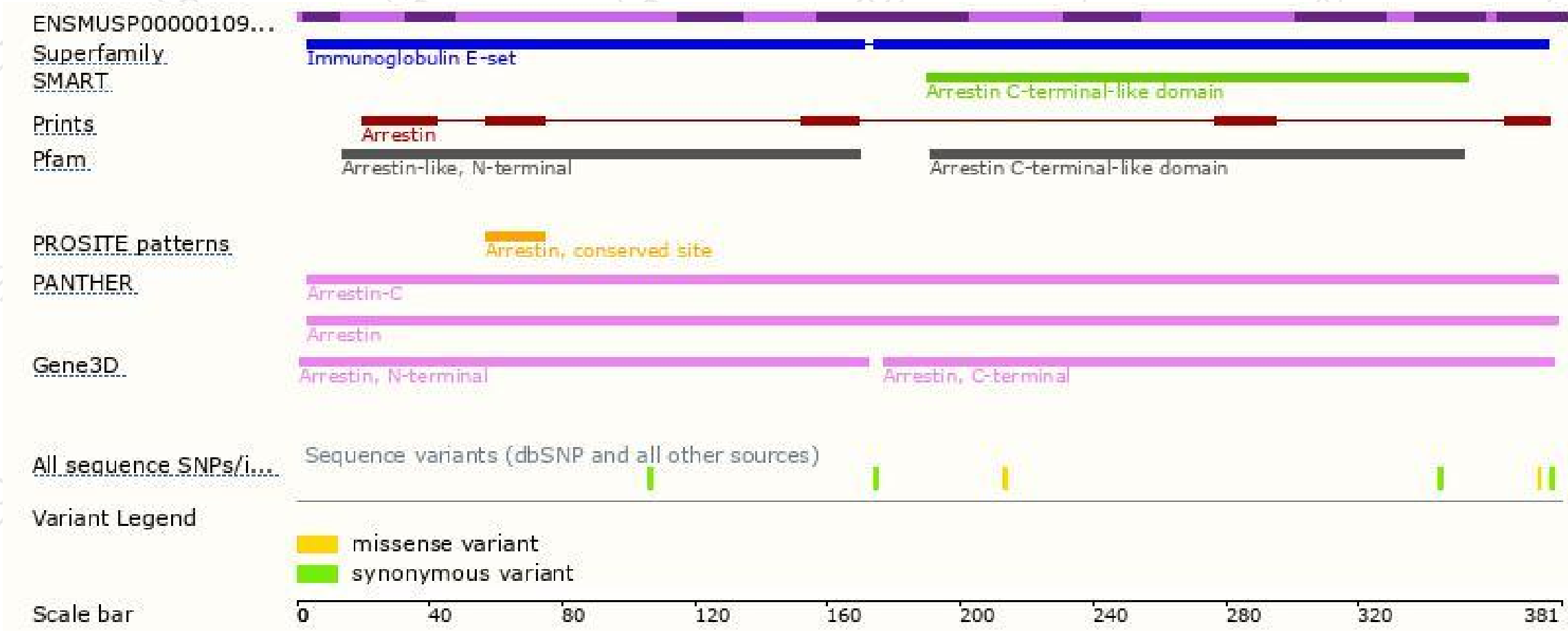
The strategy is based on the design of *Arr3-201* transcript,The transcription is shown below



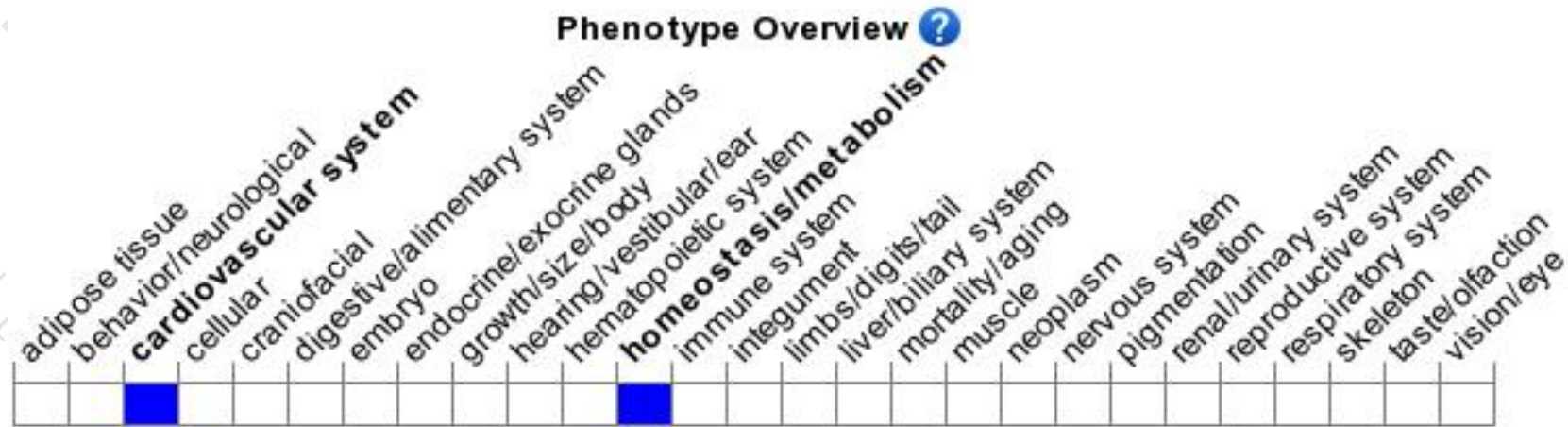
Genomic location distribution



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 null allele exhibit normal cone electrophysiology.

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

Tel: 400-9660890

