

Arhgef28 Cas9-KO Strategy

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Reviewer:

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Design Date:

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Project Overview

Project Name

Arhgef28

Project type

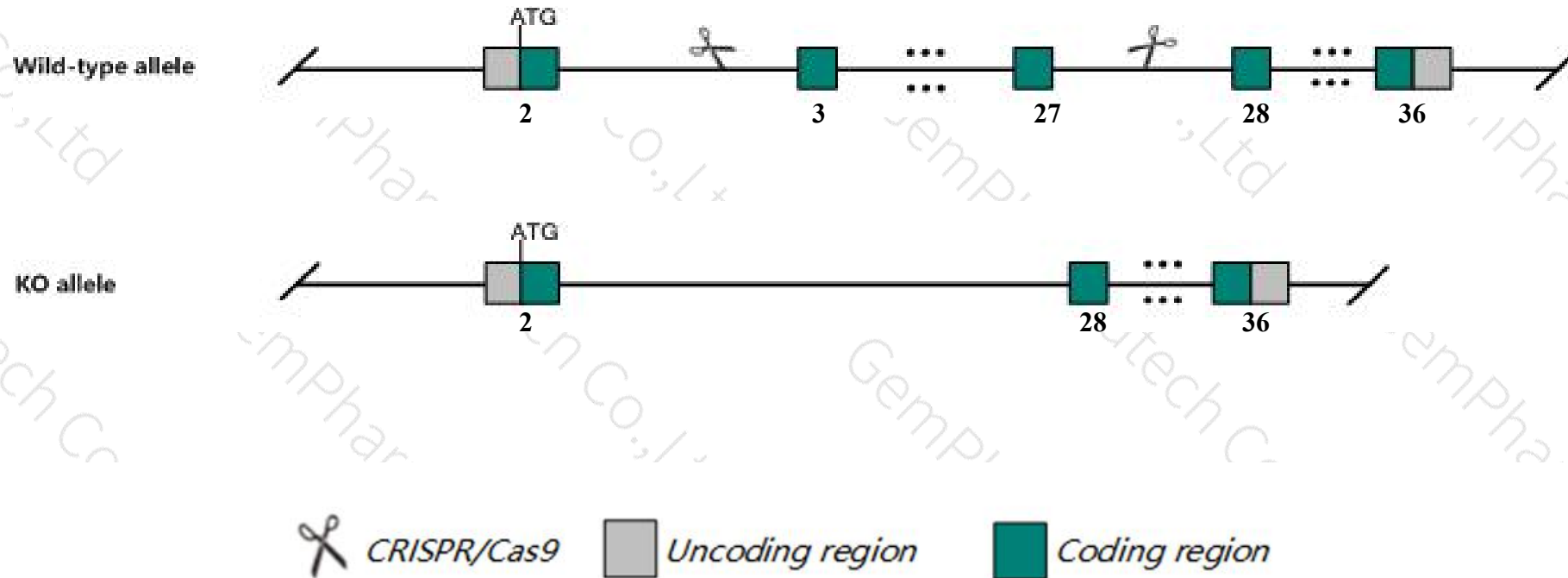
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Arhgef28* gene. The schematic diagram is as follows:



- The *Arhgef28* gene has 7 transcripts. According to the structure of *Arhgef28* gene, exon3-exon27 of *Arhgef28-201* (ENSMUST00000109426.2) transcript is recommended as the knockout region. The region contains 3524bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Arhgef28* gene. The brief process is as follows: CRISPR/Cas9 system

- According to the existing MGI data, Mice homozygous for a knock-out allele are born at lower than expected Mendelian ratios and exhibit a reduction in overall size that becomes negligible by 8 weeks of age. Mouse embryonic fibroblasts display defects in cell migration and focal adhesion formation.
- Transcript 202,203 CDS 3' incomplete the influences is unknown.
- The *Arhgef28* gene is located on the Chr13. 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)

Arhgef28 Rho guanine nucleotide exchange factor (GEF) 28 [*Mus musculus* (house mouse)]

Gene ID: 110596, updated on 13-Mar-2020

Summary

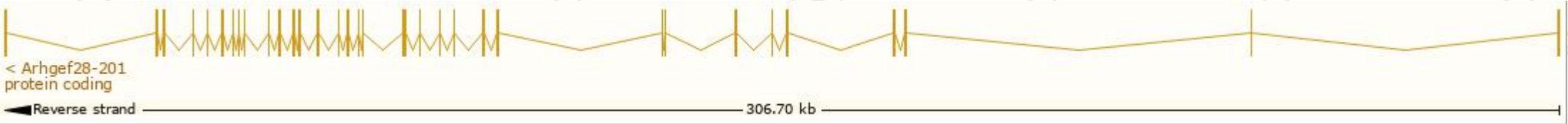
| | |
|--------------------|---|
| Official Symbol | Arhgef28 provided by MGI |
| Official Full Name | Rho guanine nucleotide exchange factor (GEF) 28 provided by MGI |
| Primary source | MGI:MGI:1346016 |
| See related | Ensembl:ENSMUSG000000021662 |
| Gene type | protein coding |
| RefSeq status | 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 | RIP2; Rgnef; RhoGEF; Rhoip2; AI323540; p190RhoGEF; D13Bwg1089e; 9230110L08Rik |
| Expression | Broad expression in kidney adult (RPKM 5.2), ovary adult (RPKM 5.2) and 22 other tissues See more |
| Orthologs | human all |

Transcript information (Ensembl)

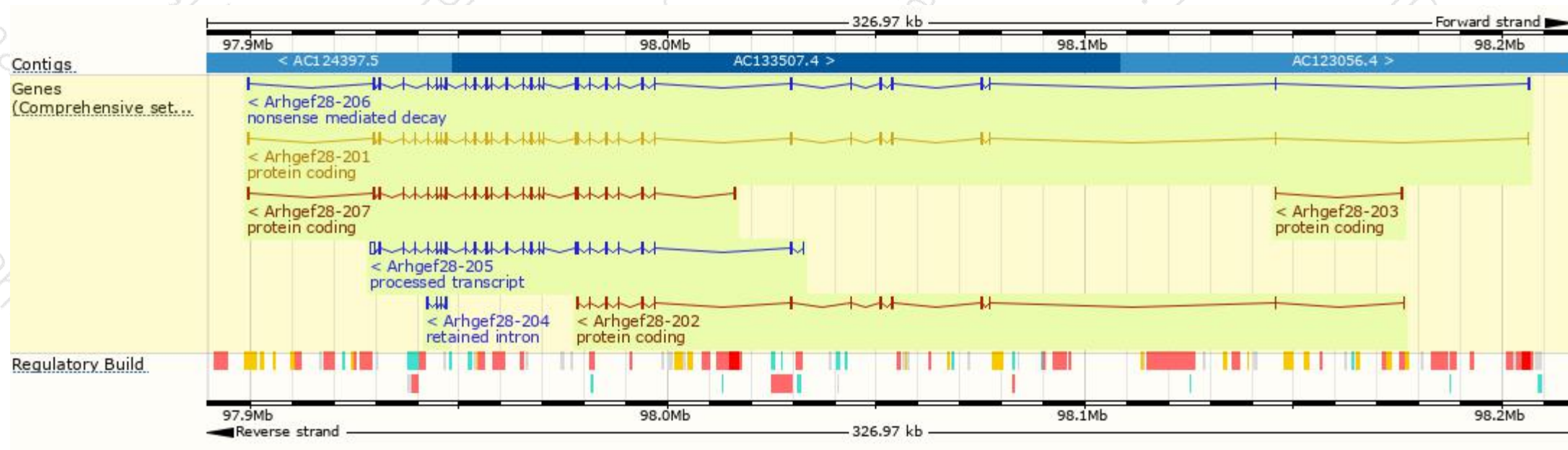
The gene has 7 transcripts,all transcripts are shown below:

| Name | Transcript ID | bp | Protein | Biotype | CCDS | UniProt | Flags |
|--------------|--------------------------------------|------|------------------------|-------------------------|---------------------------|----------------------------|-------------------------------|
| Arhgef28-201 | ENSMUST00000109426.2 | 5387 | 1700aa | Protein coding | CCDS36758 | G5E8P2 | TSL:1 GENCODE basic APPRIS P2 |
| Arhgef28-207 | ENSMUST00000238746.1 | 4660 | 1387aa | Protein coding | - | - | APPRIS ALT2 |
| Arhgef28-202 | ENSMUST00000223849.1 | 2001 | 643aa | Protein coding | - | A0A286YCY0 | CDS 3' incomplete |
| Arhgef28-203 | ENSMUST00000224866.1 | 203 | 11aa | Protein coding | - | A0A286YD71 | CDS 3' incomplete |
| Arhgef28-206 | ENSMUST00000225884.1 | 5307 | 1324aa | Nonsense mediated decay | - | A0A286YDI4 | - |
| Arhgef28-205 | ENSMUST00000225663.1 | 4977 | No protein | Processed transcript | - | - | - |
| Arhgef28-204 | ENSMUST00000225269.1 | 783 | No protein | Retained intron | - | - | - |

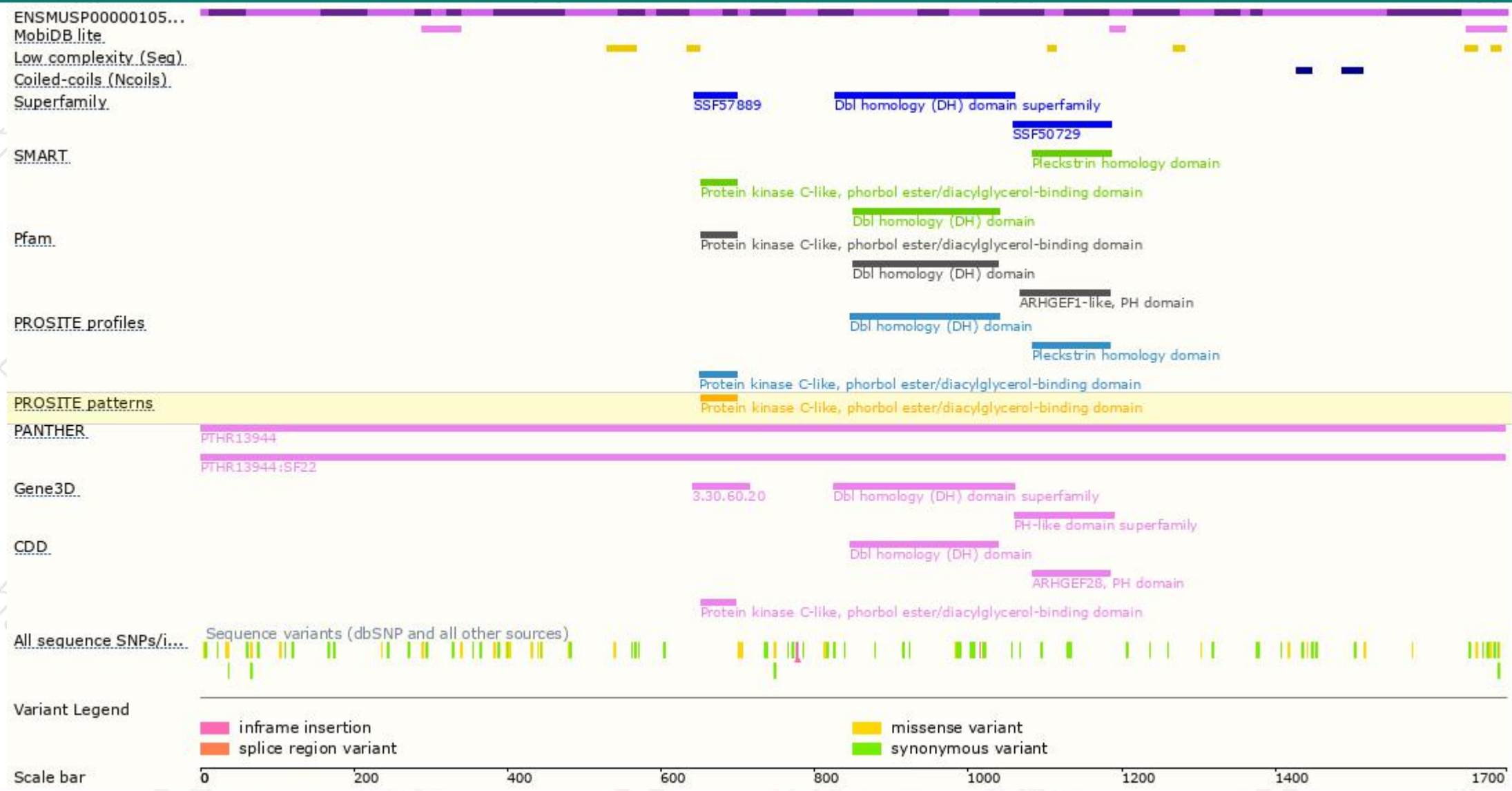
The strategy is based on the design of *Arhgef28-201* transcript,The transcription is shown below



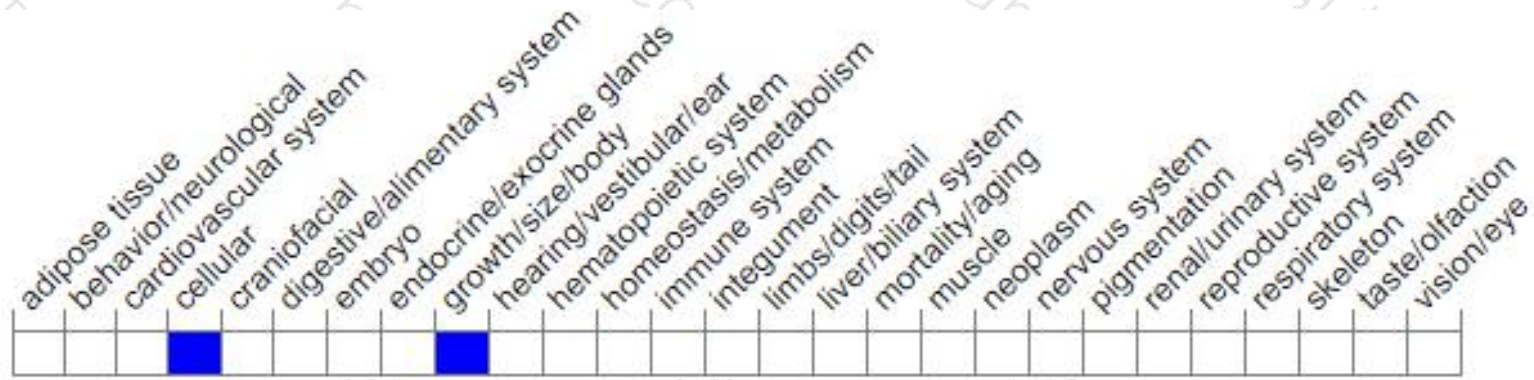
Genomic location distribution



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 are born at lower than expected Mendelian ratios and exhibit a reduction in overall size that becomes negligible by 8 weeks of age. Mouse embryonic fibroblasts display defects in cell migration and focal adhesion formation.

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

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