

Arhgef7 Cas9-KO Strategy

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Reviewer:

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Project Overview



Project Name

Arhgef7

Project type

Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Arhgef7* gene. The schematic diagram is as follows:



- The *Arhgef7* gene has 13 transcripts. According to the structure of *Arhgef7* gene, exon2-exon3 of *Arhgef7-205* (ENSMUST00000110909.8) transcript is recommended as the knockout region. The region contains 172bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Arhgef7* gene. The brief process is as follows: sgRNA was transcribed in vitro. Cas9 and sgRNA 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.

- Transcript *Arhgef7-206/207/211/212/213* may not be affected.
- The *Arhgef7* gene is located on the Chr8. 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.

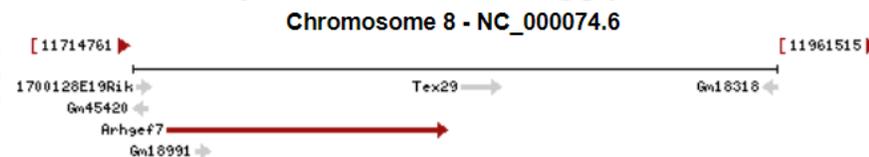
Gene information (NCBI)

Arhgef7 Rho guanine nucleotide exchange factor (GEF7) [*Mus musculus* (house mouse)]

Gene ID: 54126, updated on 19-Oct-2019

Summary

Official Symbol	Arhgef7 provided by MGI
Official Full Name	Rho guanine nucleotide exchange factor (GEF7) provided by MGI
Primary source	MGI:MGI:1860493
See related	Ensembl:ENSMUSG00000031511
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	PIX; Cool; Pak3bp; cool-1; p85SPR; betaPix; beta-Pix; p85Cool1; betaPix-b; betaPix-c; mKIAA0142
Expression	Ubiquitous expression in cerebellum adult (RPKM 15.8), whole brain E14.5 (RPKM 14.4) and 28 other tissues See more
Orthologs	human all

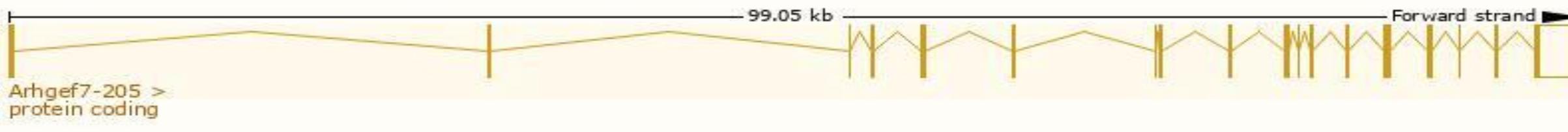


Transcript information (Ensembl)

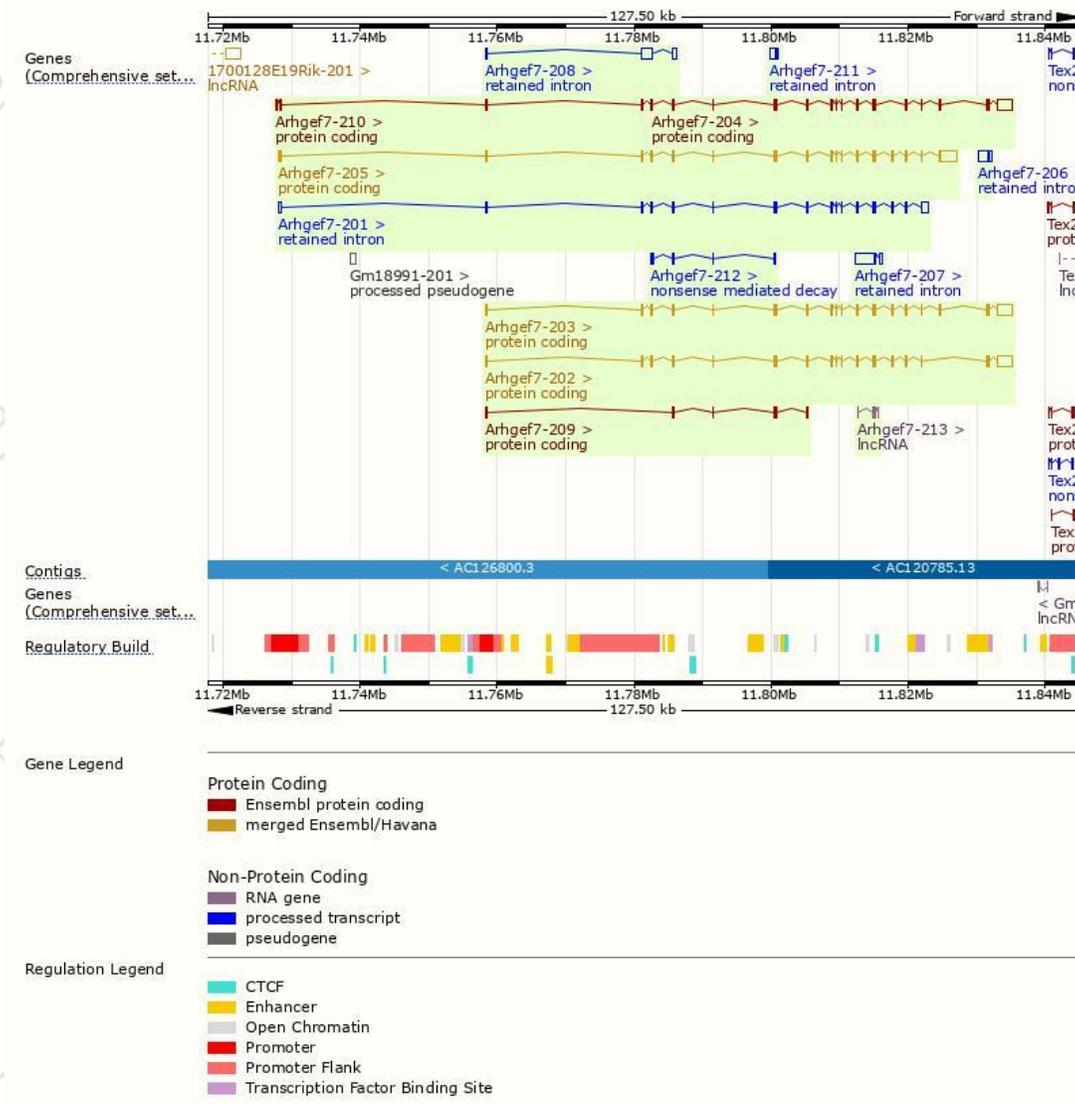
The gene has 13 transcripts, all transcripts are shown below:

Name	Transcript ID	bp	Protein	Translation ID	Biotype	CCDS	UniProt	Flags
Arhgef7-205	ENSMUST00000110909.8	4926	782aa	ENSMUSP00000106534.2	Protein coding	CCDS52480	Q9ES28	TSL:1 GENCODE basic APPRIS ALT1
Arhgef7-203	ENSMUST00000098938.8	4628	705aa	ENSMUSP00000096538.2	Protein coding	CCDS52481	Q9ES28	TSL:1 GENCODE basic APPRIS ALT1
Arhgef7-202	ENSMUST00000074856.12	4451	646aa	ENSMUSP00000074399.6	Protein coding	CCDS22099	A0A0R4J0X8	TSL:1 GENCODE basic APPRIS P3
Arhgef7-204	ENSMUST00000110904.1	4038	636aa	ENSMUSP00000106529.2	Protein coding	-	D3Z0V2	CDS 5' incomplete TSL:1
Arhgef7-209	ENSMUST00000210012.1	732	200aa	ENSMUSP00000147641.1	Protein coding	-	A0A1B0GRS3	CDS 3' incomplete TSL:3
Arhgef7-210	ENSMUST00000210104.1	574	131aa	ENSMUSP00000148109.1	Protein coding	-	A0A1B0GSX2	CDS 3' incomplete TSL:3
Arhgef7-212	ENSMUST00000211409.1	613	68aa	ENSMUSP00000148111.1	Nonsense mediated decay	-	A0A1B0GSX4	CDS 5' incomplete TSL:3
Arhgef7-207	ENSMUST00000154204.1	3355	No protein	-	Retained intron	-	-	TSL:1
Arhgef7-201	ENSMUST00000033908.13	3221	No protein	-	Retained intron	-	-	TSL:1
Arhgef7-208	ENSMUST00000209686.1	2205	No protein	-	Retained intron	-	-	TSL:5
Arhgef7-206	ENSMUST00000151225.1	1761	No protein	-	Retained intron	-	-	TSL:1
Arhgef7-211	ENSMUST00000210287.1	898	No protein	-	Retained intron	-	-	TSL:5
Arhgef7-213	ENSMUST00000211510.1	334	No protein	-	lncRNA	-	-	TSL:3

The strategy is based on the design of *Arhgef7-205* transcript, The transcription is shown below



Genomic location distribution



Protein domain



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

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