

Arid4a Cas9-CKO Strategy

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Project Overview

Project Name

Arid4a

Project type

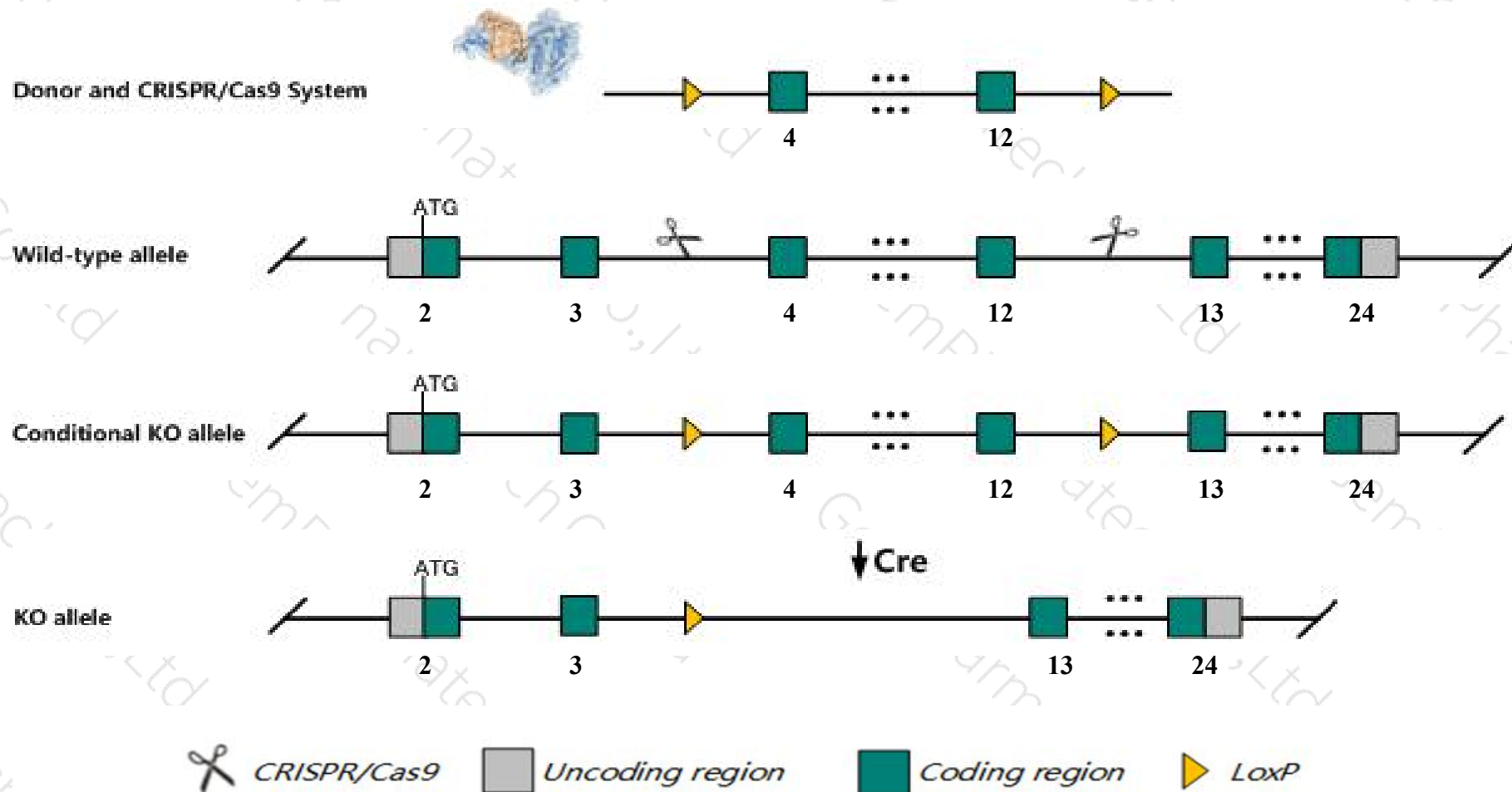
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Arid4a* gene. The schematic diagram is as follows:



- The *Arid4a* gene has 4 transcripts. According to the structure of *Arid4a* gene, exon4-exon12 of *Arid4a*-201 (ENSMUST00000046305.11) transcript is recommended as the knockout region. The region contains 862bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Arid4a* gene. The brief process is as follows: CRISPR/Cas9 system 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 altered DNA methylation patterns, disrupted hematopoiesis and a portion develop acute myeloid leukemia.
- The *Arid4a* gene is located on the Chr12. 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)

Arid4a AT rich interactive domain 4A (RBP1-like) [Mus musculus (house mouse)]

Gene ID: 238247, updated on 13-Mar-2020

Summary



Official Symbol	Arid4a provided by MGI
Official Full Name	AT rich interactive domain 4A (RBP1-like) provided by MGI
Primary source	MGI:MGI:2444354
See related	Ensembl:ENSMUSG00000048118
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	A630009N03, A630067N03Rik, Rbbp1
Expression	Ubiquitous expression in bladder adult (RPKM 3.7), frontal lobe adult (RPKM 3.5) and 28 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

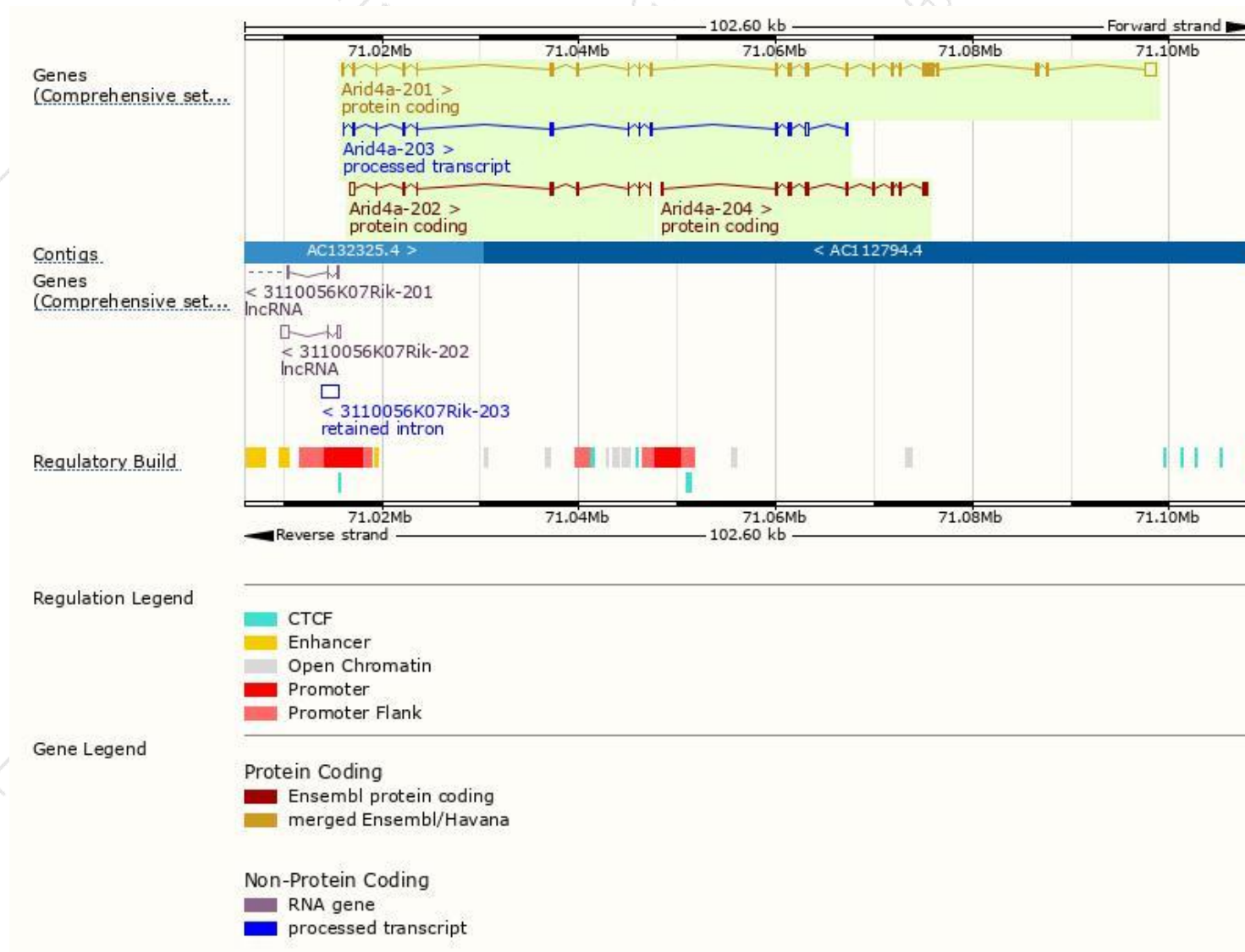
The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Arid4a-201	ENSMUST00000046305.11	4998	1261aa	Protein coding	CCDS36471	F8VPQ2	TSL:5 GENCODE basic APPRIS is a system to annotate alternatively spliced transcripts based on a range of computational methods to identify the most functionally important transcript(s) of a gene. APPRIS P1
Arid4a-204	ENSMUST00000135709.1	1887	531aa	Protein coding	-	E9Q9V1	CDS 3' incomplete TSL:1
Arid4a-202	ENSMUST00000125125.1	1320	295aa	Protein coding	-	Q8BY40	CDS 3' incomplete TSL:1
Arid4a-203	ENSMUST00000134718.1	1639	No protein	Processed transcript	-	-	TSL:1

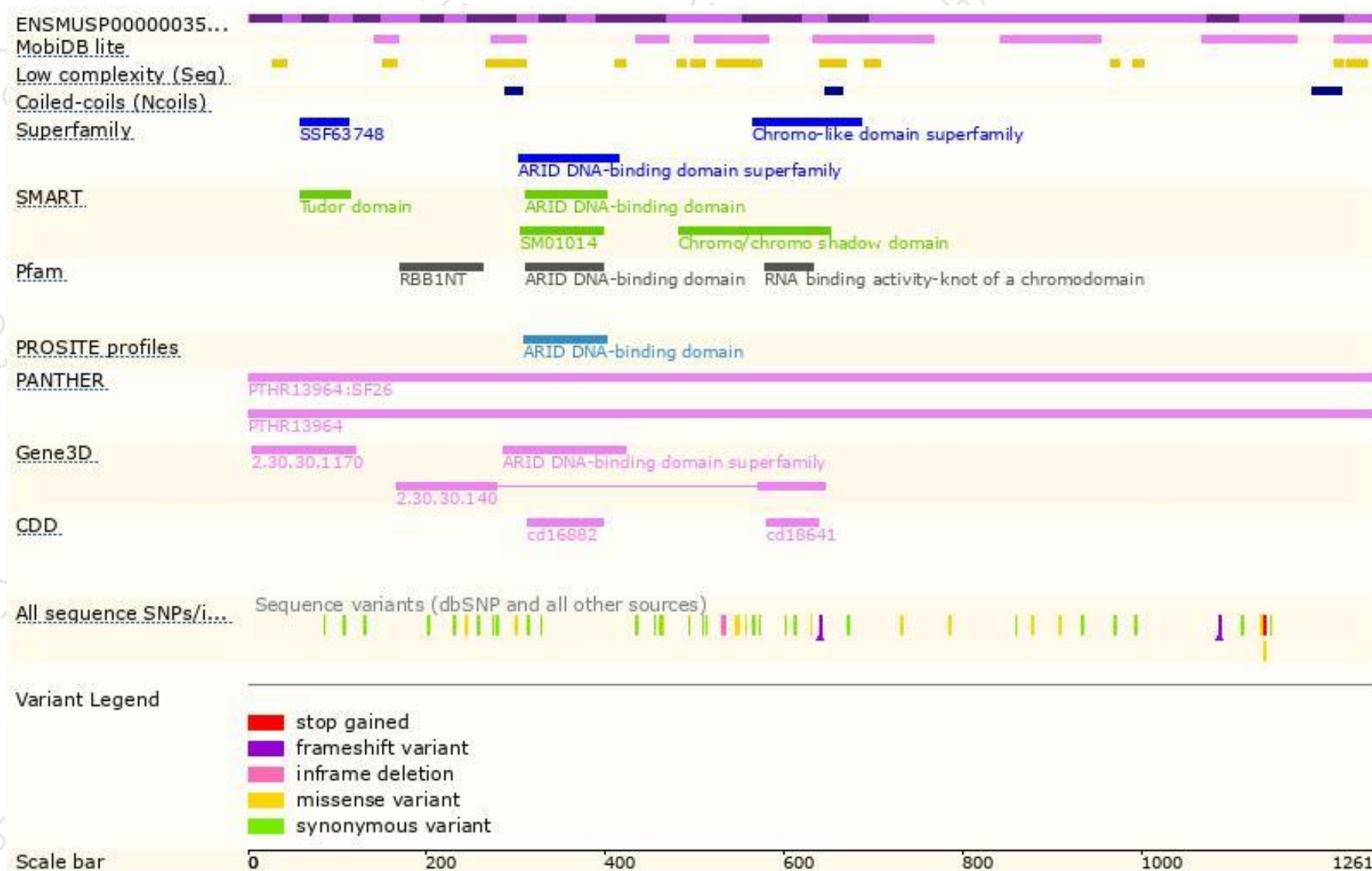
The strategy is based on the design of *Arid4a-201* transcript,The transcription is shown below



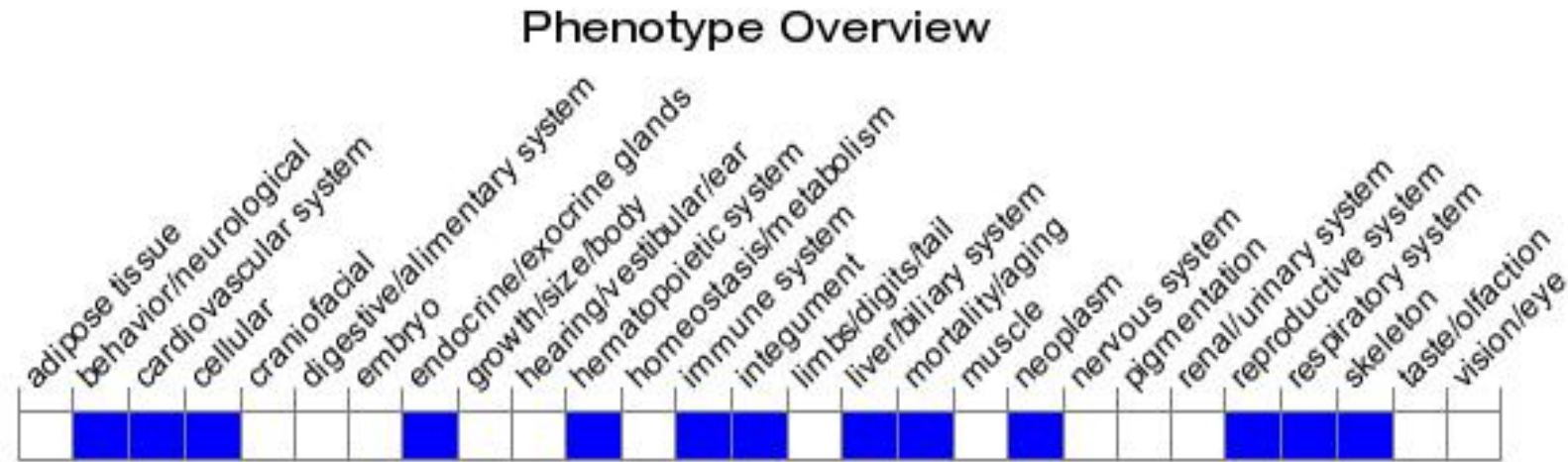
Genomic location distribution



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 altered DNA methylation patterns, disrupted hematopoiesis and a portion develop acute myeloid leukemia.

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

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