Ak1 Cas9-KO Strategy

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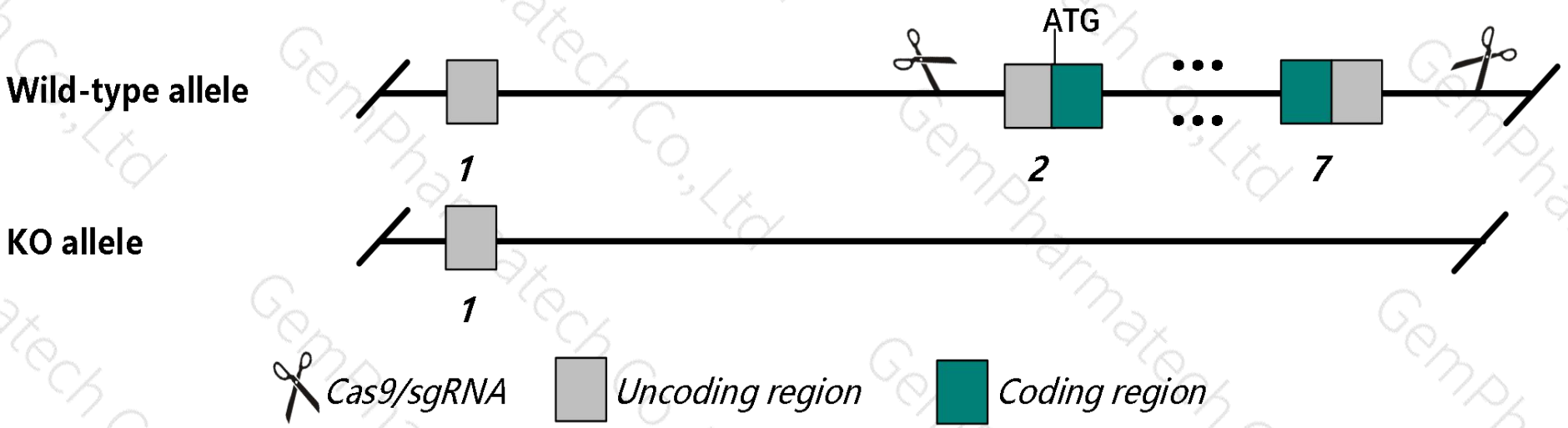
Project Overview

Project Name	***Ak1***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Ak1* gene. The schematic diagram is as follows:



Technical routes

➢ The *Ak1* gene has 6 transcripts. According to the structure of *Ak1* gene, exon2-exon7 of *Ak1-203* (ENSMUST00000113278.8) 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 *Ak1* gene. The brief process is as follows: CRISPR/Cas9 system w

Notice

- According to the existing MGI data,Homozygotes for a targeted null mutation exhibit increased adenosine triphosphate (ATP) turnover and reduced efficiency of ATP utilization during muscle contraction.

- The *Ak1* gene is located on the Chr2. 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）

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Ak1 adenylate kinase 1 [*Mus musculus* (house mouse)]

Gene ID: 11636, updated on 5-Jan-2020

Summary

Official Symbol	Ak1 provided by MGI
Official Full Name	adenylate kinase 1 provided by MGI
Primary source	MGI:MGI:87977
See related	Ensembl:ENSMUSG00000026817
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	Ak-1; B430205N08Rik
Expression	Broad expression in heart adult (RPKM 107.3), testis adult (RPKM 39.2) and 15 other tissues See more
Orthologs	human all

Genomic context

Location: 2 B; 2 22.09 cM

See Ak1 in Genome Data Viewer

Exon count: 10

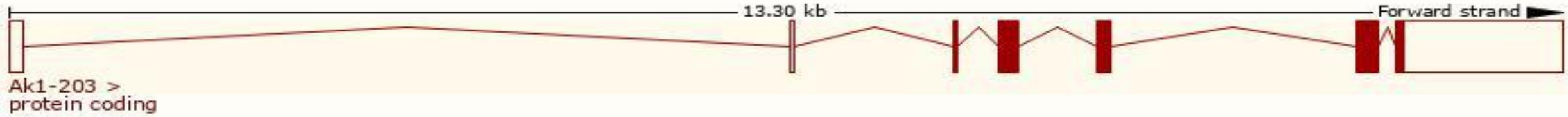
Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	2	NC_000068.7 (32621758..32635058)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	2	NC_000068.6 (32485024..32490572)

Transcript information（Ensembl）

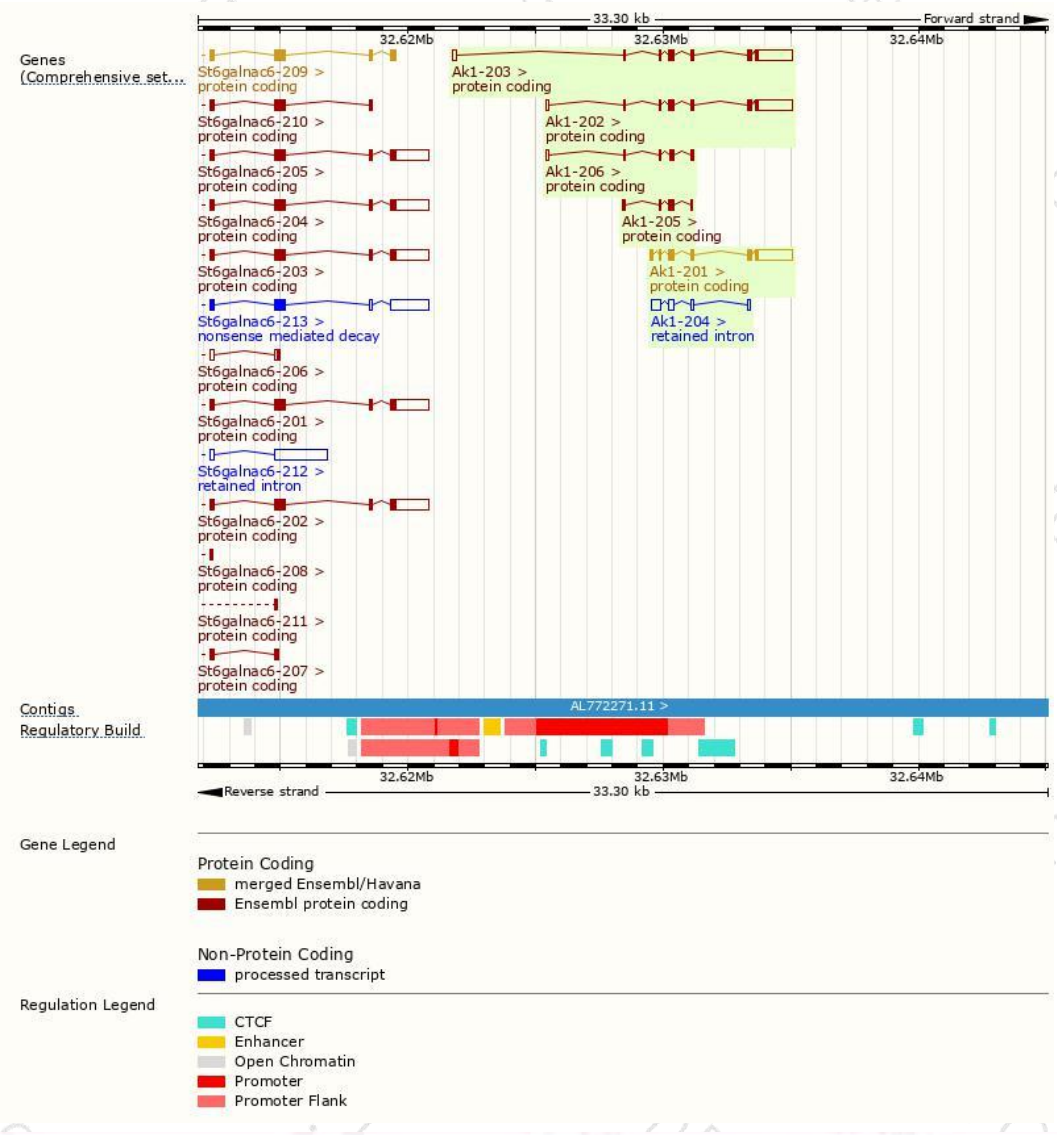
The gene has 6 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Ak1-203	ENSMUST00000113278.8	2085	194aa	Protein coding	CCDS57167	Q9R0Y5	TSL:1 GENCODE basic APPRIS P1
Ak1-202	ENSMUST00000113277.7	2063	194aa	Protein coding	CCDS57167	Q9R0Y5	TSL:1 GENCODE basic APPRIS P1
Ak1-201	ENSMUST00000068271.4	2034	210aa	Protein coding	CCDS15924	Q9R0Y5	TSL:1 GENCODE basic
Ak1-206	ENSMUST00000195721.5	421	96aa	Protein coding	-	A0A0A6YXW8	CDS 3' incomplete TSL:3
Ak1-205	ENSMUST00000156578.7	359	89aa	Protein coding	-	Z4YN97	CDS 3' incomplete TSL:2
Ak1-204	ENSMUST00000135392.1	752	No protein	Retained intron	-	-	TSL:2

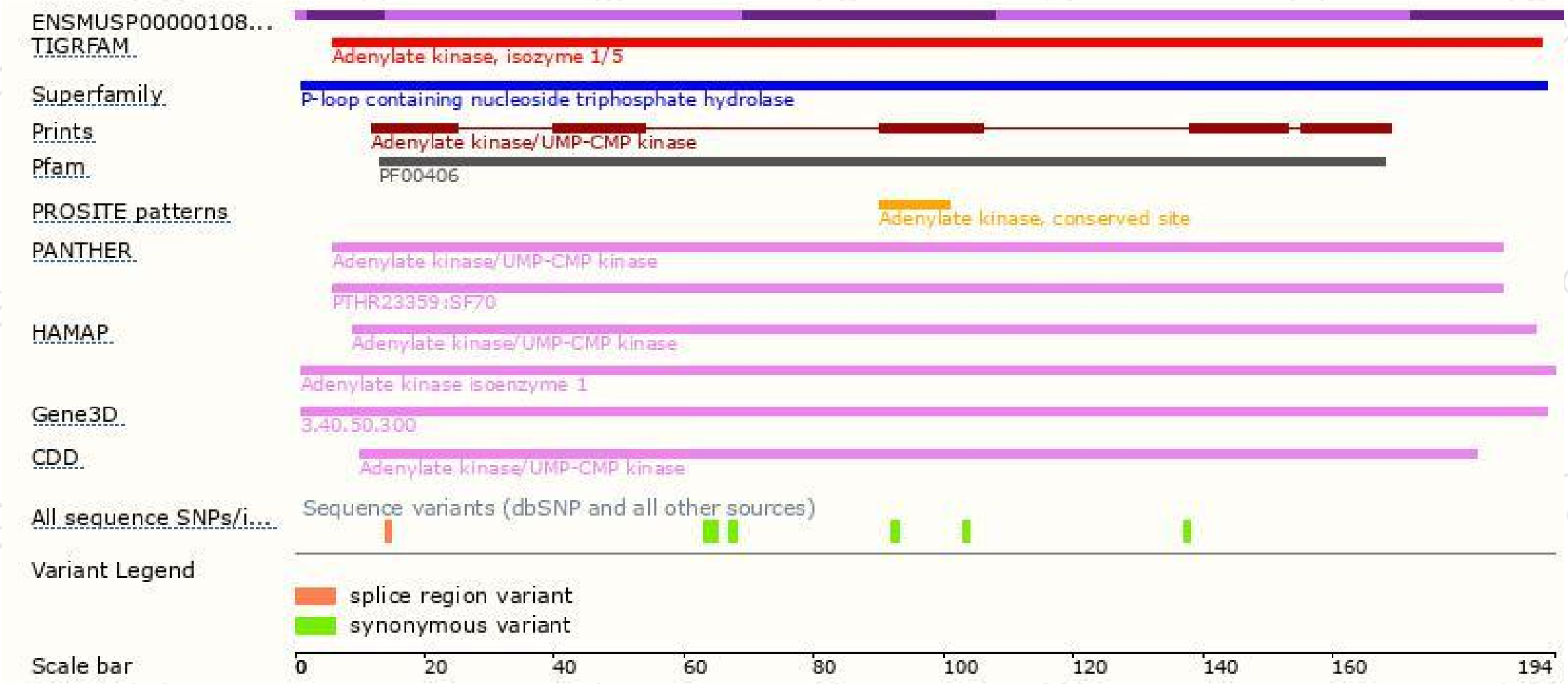
The strategy is based on the design of *Ak1-203* transcript,The transcription is shown below



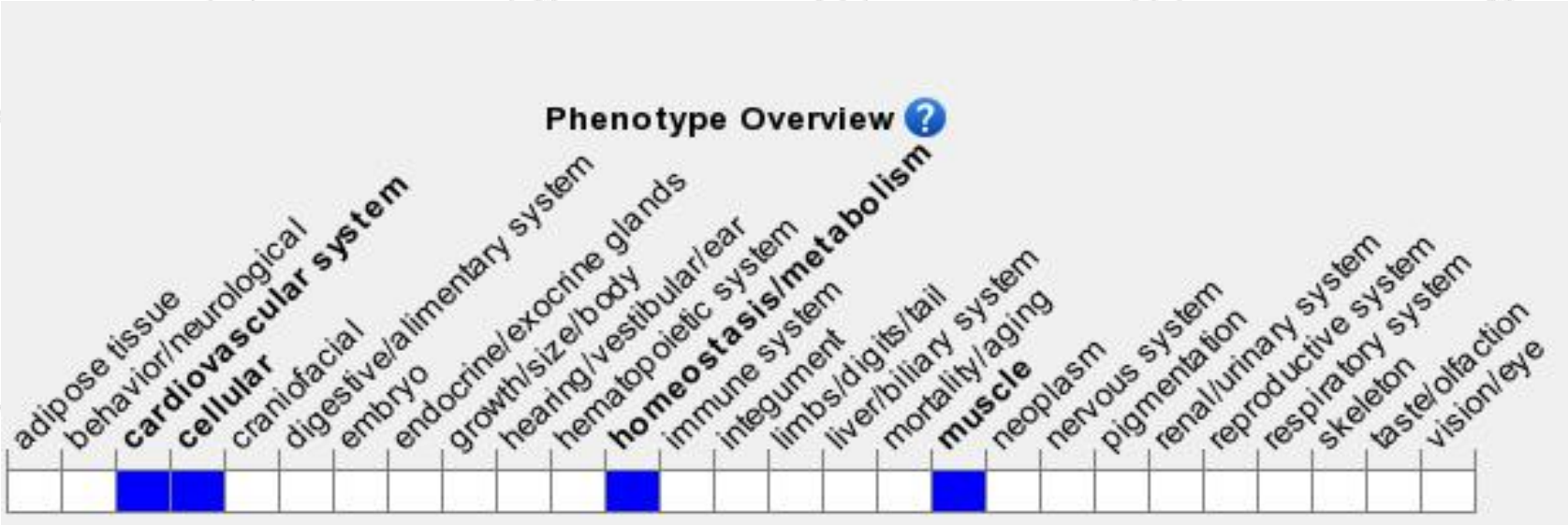
Genomic location distribution



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/).

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

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