Adra1b Cas9-KO Strategy

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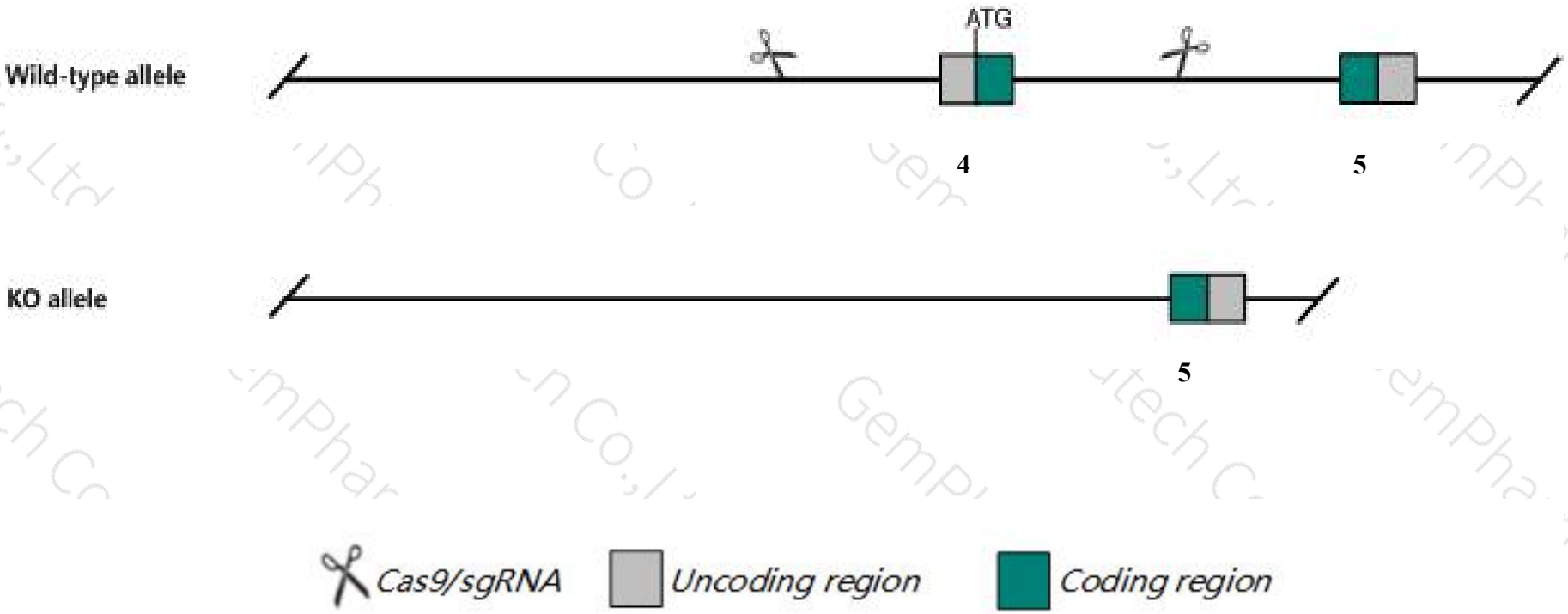
Project Overview

Project Name	***Adra1b***
Project type	**Cas9-KO**
Strain background	**C57BL/6J**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Adra1b* gene. The schematic diagram is as follows:



Technical routes

- The *Adra1b* gene has 4 transcripts. According to the structure of *Adra1b* gene, exon4 of *Adra1b-201* (ENSMUST00000067258.8) transcript is recommended as the knockout region.The region contains start codon ATG. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Adra1b* gene. The brief process is as follows: sgRNA was transcribed in vitro.Cas9 and sgRNA were microinjected into the fertilized eggs of C57BL/6J 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/6J mice.

Notice

- According to the existing MGI data,Targeted mutations that inactivate the gene affect atrial contractility and left ventricle function, suggesting their use in modeling chronic heart failure in humans.

- The *Adra1b* gene is located on the Chr11. 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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Adra1b adrenergic receptor, alpha 1b [Mus musculus (house mouse)]

Gene ID: 11548, updated on 31-Jan-2019

Summary

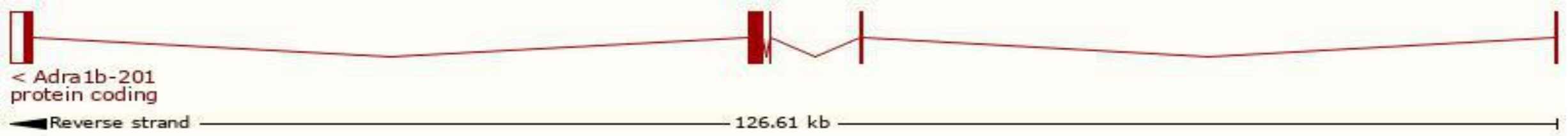
Official Symbol	Adra1b provided by MGI
Official Full Name	adrenergic receptor, alpha 1b provided by MGI
Primary source	MGI:MGI:104774
See related	Ensembl:ENSMUSG00000050541
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	[a]1b
Expression	Biased expression in liver adult (RPKM 44.6), heart adult (RPKM 12.4) and 6 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

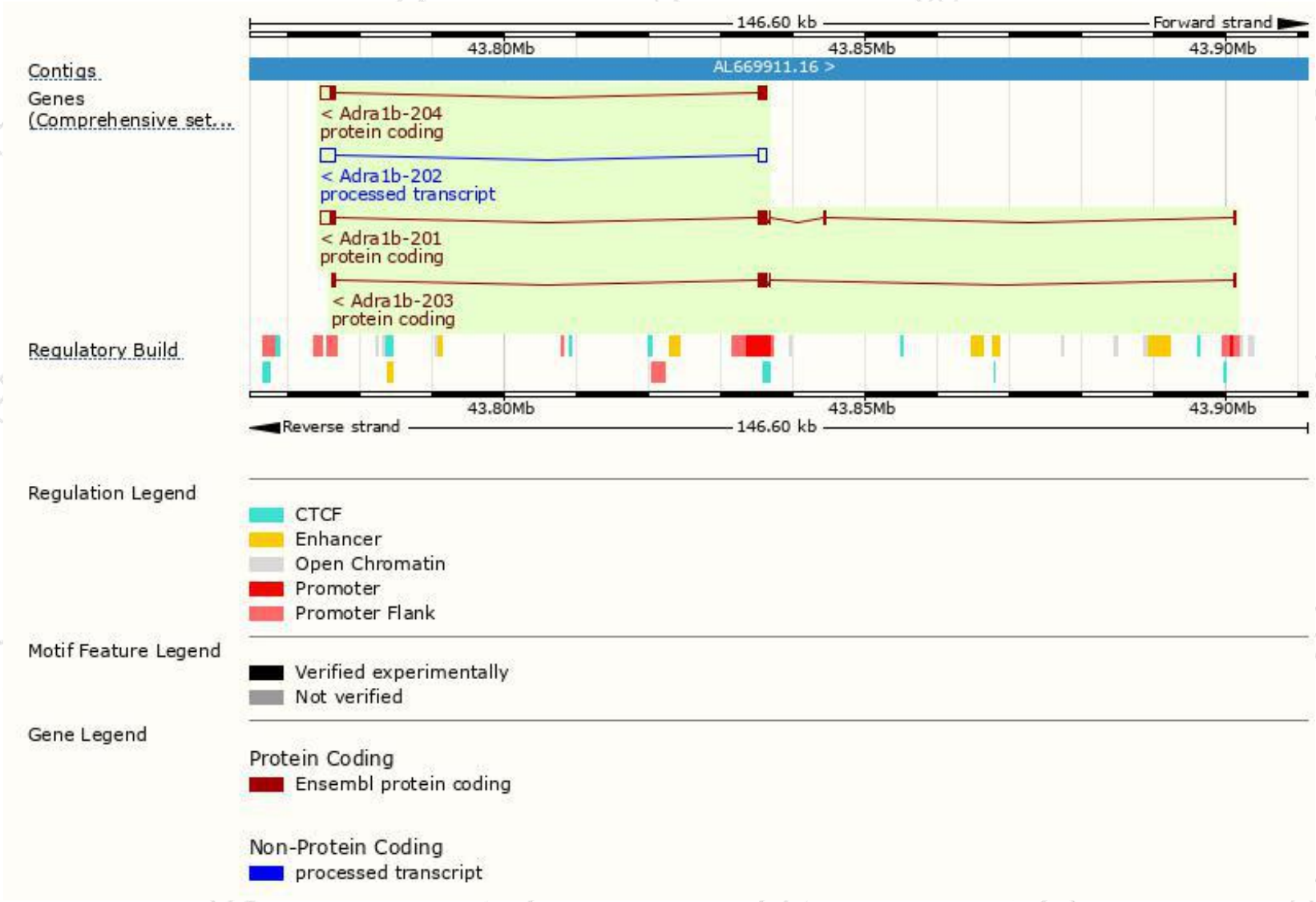
The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Adra1b-201	ENSMUST00000067258.8	3331	515aa	Protein coding	CCDS24562	Q9DBL0	TSL:1 GENCODE basic APPRIS P1
Adra1b-204	ENSMUST00000167574.1	3047	515aa	Protein coding	CCDS24562	Q9DBL0	TSL:1 GENCODE basic APPRIS P1
Adra1b-203	ENSMUST00000139906.1	1764	462aa	Protein coding	-	B1AU41	CDS 3' incomplete TSL:1
Adra1b-202	ENSMUST00000124306.1	3047	No protein	Processed transcript	-	-	TSL:1

The strategy is based on the design of *Adra1b-201* transcript,The transcription is shown below

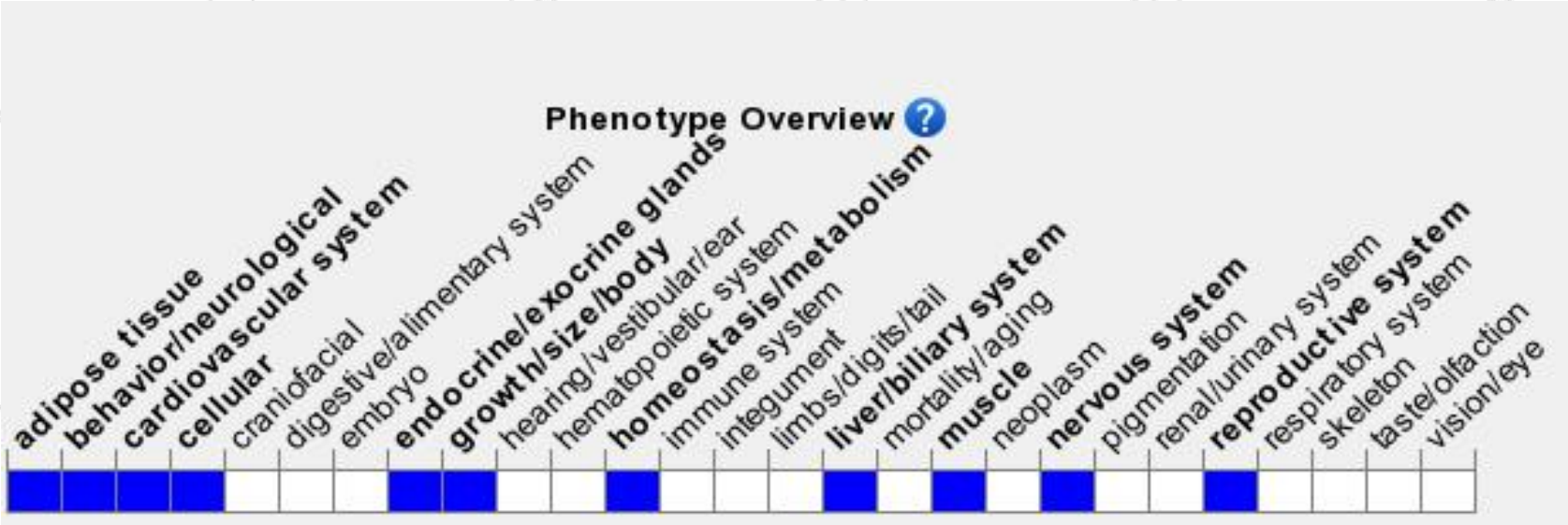


Genomic location distribution



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/).

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

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