Atp6v0a1 Cas9-CKO Strategy

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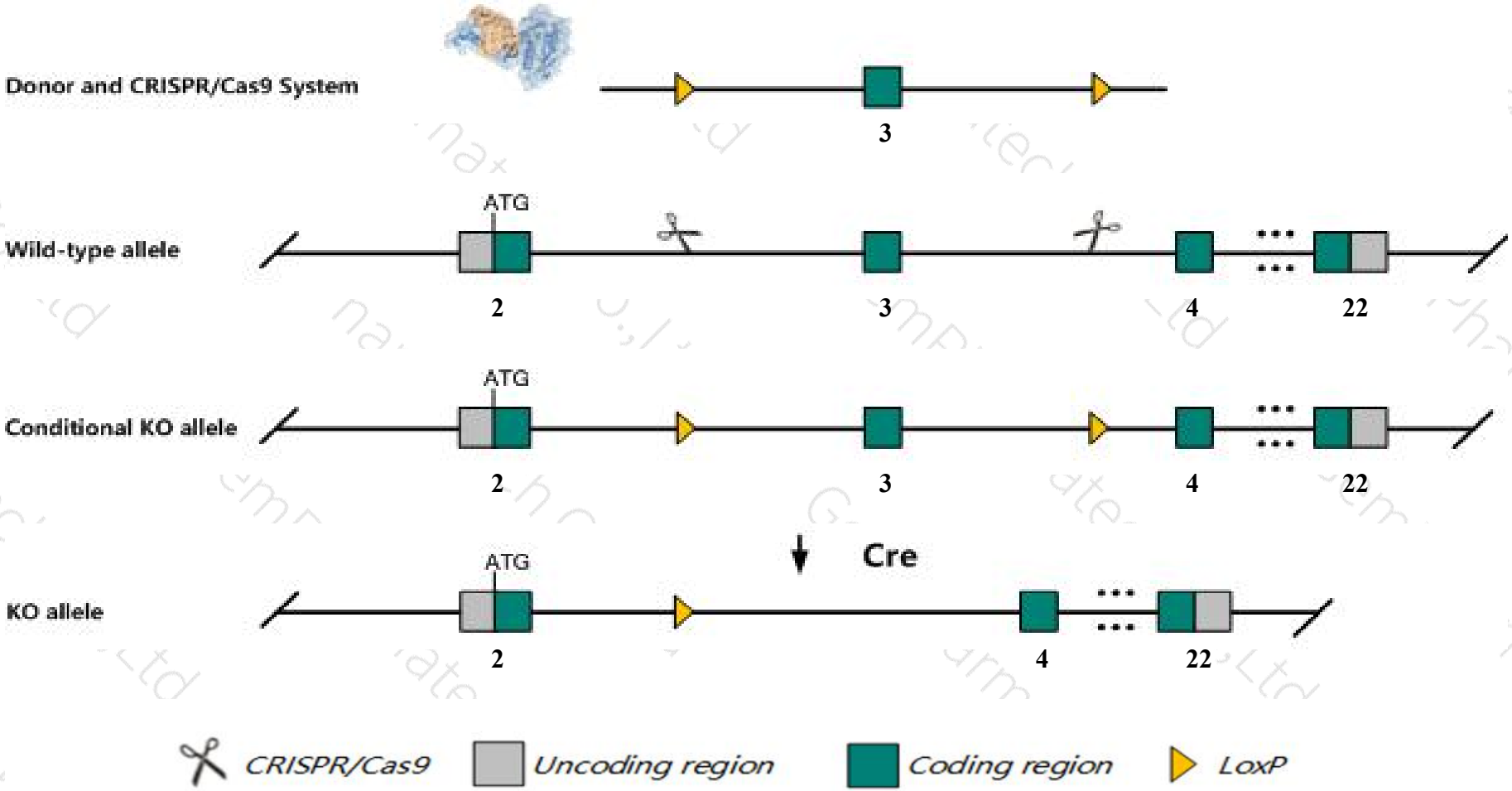
Project Overview

Project Name	***Atp6v0a1***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Atp6v0a1* gene. The schematic diagram is as follows:



Technical routes

➢ The *Atp6v0a1* gene has 10 transcripts. According to the structure of *Atp6v0a1* gene, exon3 of *Atp6v0a1-201*(ENSMUST00000044721.12) transcript is recommended as the knockout region.The region contains 79bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Atp6v0a1* 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.

Notice

➢ The *Atp6v0a1* 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at existing technological level.

Gene information （NCBI）

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Atp6v0a1 ATPase, H+ transporting, lysosomal V0 subunit A1 [Mus musculus (house mouse)]

Gene ID: 11975, updated on 13-Mar-2020

Summary

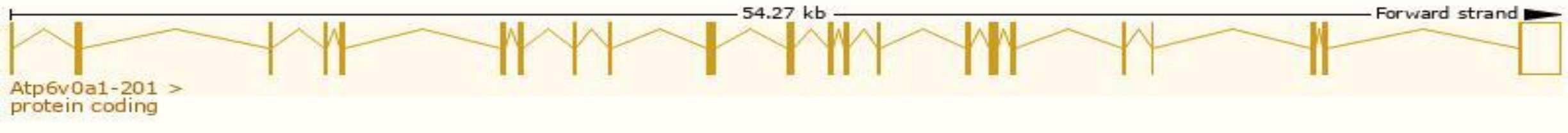
Official Symbol	Atp6v0a1 provided by MGI
Official Full Name	ATPase, H+ transporting, lysosomal V0 subunit A1 provided byMGI
Primary source	MGI:MGI:103286
See related	Ensembl:ENSMUSG00000019302
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	AA959968, ATP6a1, Atp6n1, Atp6n1a, Atpv0a1, Vpp-1, Vpp1
Expression	Ubiquitous expression in cortex adult (RPKM 75.9), frontal lobe adult (RPKM 74.3) and 28 other tissuesSee more
Orthologs	human all

Transcript information（Ensembl）

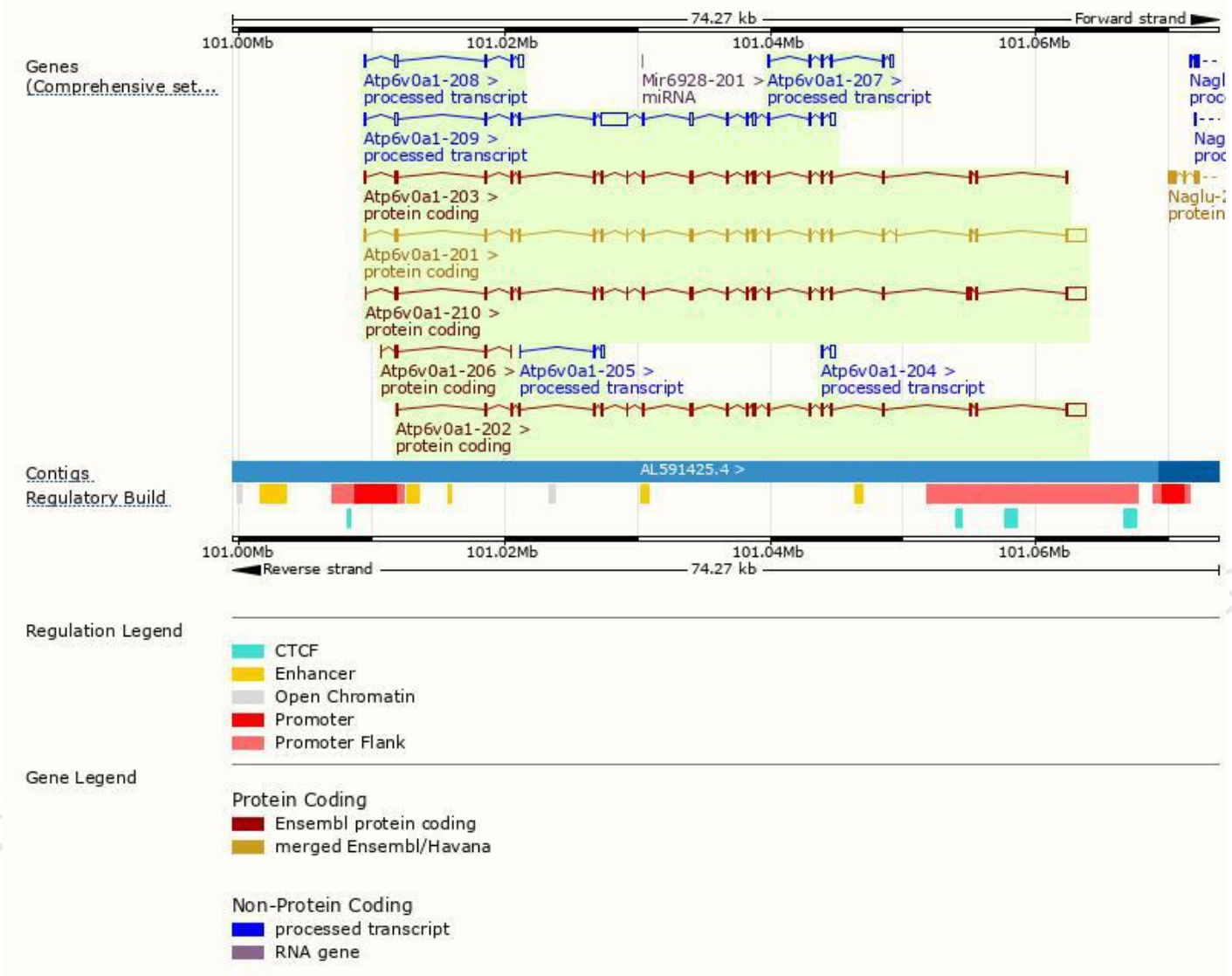
The gene has 10 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Atp6v0a1-201	ENSMUST00000044721.12	4008	838aa	Protein coding	CCDS25443	Q9Z1G4	TSL:1 GENCODE basic APPRIS P3
Atp6v0a1-202	ENSMUST00000092663.3	3813	832aa	Protein coding	CCDS56809	Q9Z1G4	TSL:1 GENCODE basic APPRIS ALT1
Atp6v0a1-203	ENSMUST00000103110.9	2716	839aa	Protein coding	CCDS56808	Q9Z1G4	TSL:5 GENCODE basic APPRIS ALT1
Atp6v0a1-210	ENSMUST00000168757.8	3967	838aa	Protein coding	-	K3W4T3	TSL:5 GENCODE basic APPRIS ALT1
Atp6v0a1-206	ENSMUST00000139619.7	373	79aa	Protein coding	-	A2A599	CDS 3' incomplete TSL:3
Atp6v0a1-209	ENSMUST00000154896.7	4162	No protein	Processed transcript	-	-	TSL:1
Atp6v0a1-207	ENSMUST00000139857.1	844	No protein	Processed transcript	-	-	TSL:1
Atp6v0a1-208	ENSMUST00000151554.1	828	No protein	Processed transcript	-	-	TSL:2
Atp6v0a1-204	ENSMUST00000127810.1	504	No protein	Processed transcript	-	-	TSL:2
Atp6v0a1-205	ENSMUST00000134919.1	384	No protein	Processed transcript	-	-	TSL:2

The strategy is based on the design of *Atp6v0a1-201* transcript,the transcription is shown below:

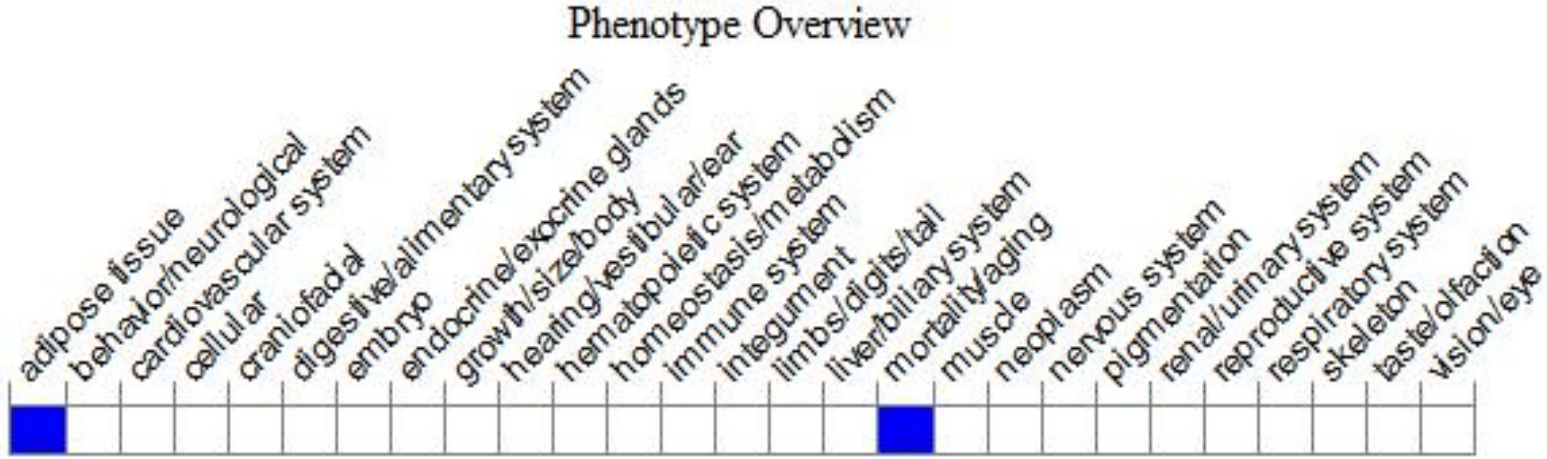


Genomic location distribution



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/).

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

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