GemPharmatech™

Atp5pb Cas9-KO Strategy

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Design Date: 2024-4-22

Overview

Target Gene Name

- Atp5pb

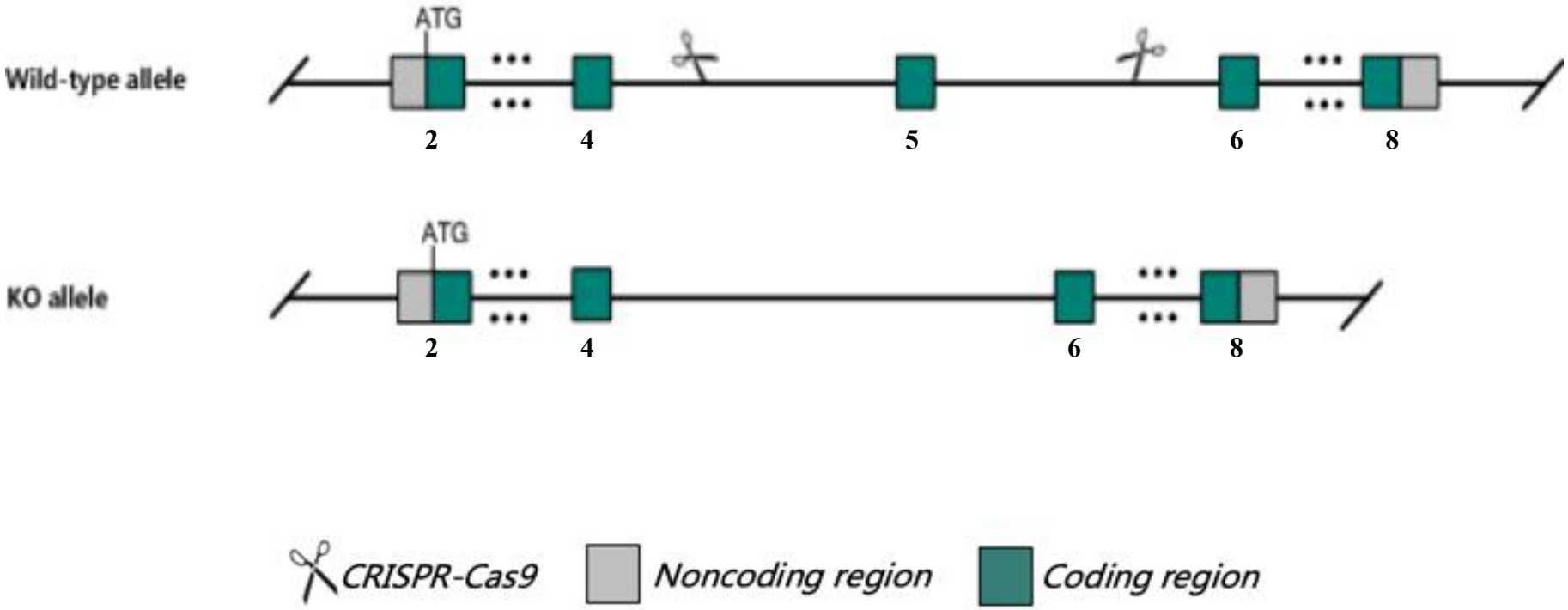
Project Type

- Cas9-KO

Genetic Background

- C57BL/6JGpt

Strain Strategy



Technical Information

- The *Atp5pb* gene has 6 transcripts. According to the structure of *Atp5pb* gene, exon5 of *Atp5pb*-201 (ENSMUST00000118209.8) transcript is recommended as the knockout region. The region contains 164bp coding sequence. Knocking out the region will result in disruption of protein function.
- In this project we use CRISPR-Cas9 technology to modify *Atp5pb* gene. The brief process is as follows: gRNAs were transcribed in vitro. Cas9 and gRNAs 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 on-target amplicon sequencing. A stable F1-generation mouse strain was obtained by mating positive F0-generation mice with C57BL/6JGpt mice and confirmation of the desired mutant allele was carried out by PCR and on-target amplicon sequencing.

Gene Information

Atp5pb ATP synthase peripheral stalk-membrane subunit b [*Mus musculus* (house mouse)]

Download Datasets

Gene ID: 11950, updated on 11-Apr-2024

Summary

Official Symbol	Atp5pb provided by MGI
Official Full Name	ATP synthase peripheral stalk-membrane subunit b provided by MGI
Primary source	MGI:MGI:1100495
See related	Ensembl:ENSMUSG00000000563 AllianceGenome:MGI:1100495
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	Atp5f1
Summary	Predicted to enable proton transmembrane transporter activity. Predicted to contribute to proton-transporting ATP synthase activity, rotational mechanism. Predicted to be involved in mitochondrial ATP synthesis coupled proton transport. Predicted to act upstream of or within ion transport. Located in mitochondrial inner membrane and myelin sheath. Is expressed in several structures, including alimentary system; genitourinary system; heart; nervous system; and sensory organ. Orthologous to human ATP5PB (ATP synthase peripheral stalk-membrane subunit b). [provided by Alliance of Genome Resources, Apr 2022]
Expression	Ubiquitous expression in duodenum adult (RPKM 196.9), heart adult (RPKM 162.8) and 28 other tissues See more
Orthologs	human all

NEW Try the new Gene table
Try the new Transcript table

Source: https://www.ncbi.nlm.nih.gov/

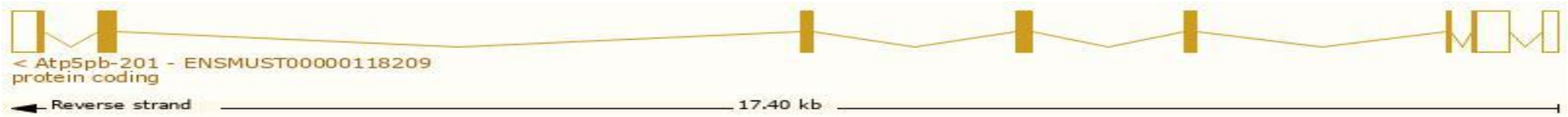
Transcript Information

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

Show/hide columns (1 hidden) Filter

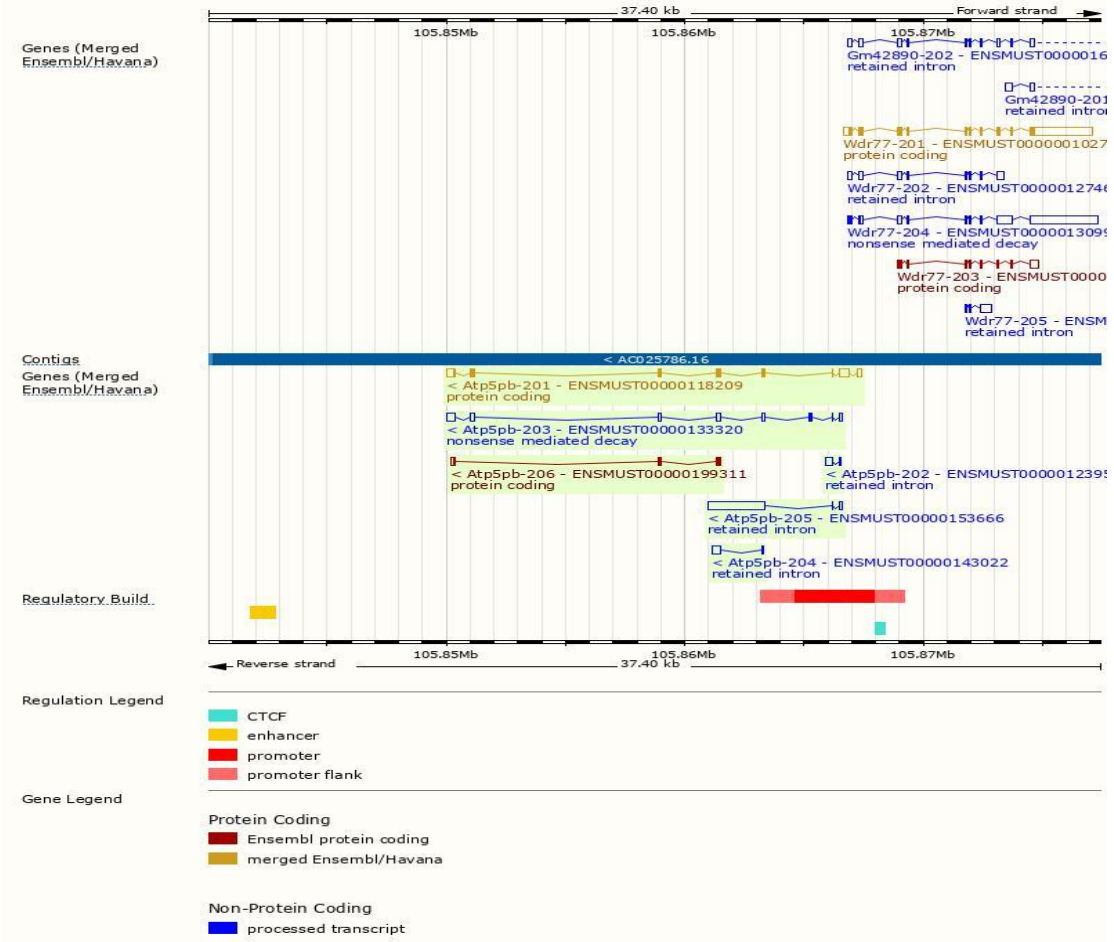
Transcript ID	Name	bp	Protein	Biotype	CCDS	UniProt Match	Flags
ENSMUST00000153666.2	Atp5pb-205	2527	No protein	Retained intron		-	TSL:2
ENSMUST00000143022.2	Atp5pb-204	466	No protein	Retained intron		-	TSL:2
ENSMUST00000123959.2	Atp5pb-202	407	No protein	Retained intron		-	TSL:2
ENSMUST00000118209.8	Atp5pb-201	1604	256aa	Protein coding	CCDS17714	Q5I0W0 Q9CQQ7	Ensembl Canonical GENCODE basic APPRIS P1 TSL:5
ENSMUST00000199311.2	Atp5pb-206	456	122aa	Protein coding		A0A0G2JGX3	TSL:5 CDS 5' incomplete
ENSMUST00000133320.2	Atp5pb-203	1311	59aa	Nonsense mediated decay		D6RGL7	TSL:1

The strategy is based on the design of *Atp5pb*-201 transcript, the transcription is shown below:



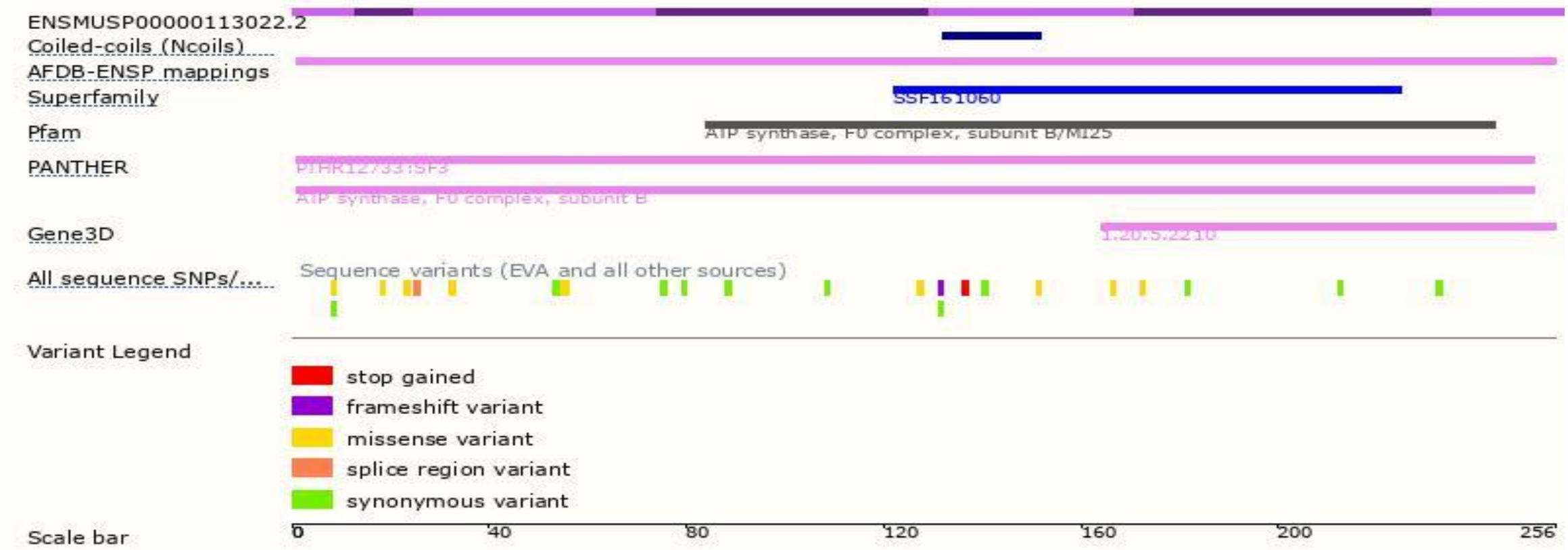
Source: https://www.ensembl.org

Genomic Information



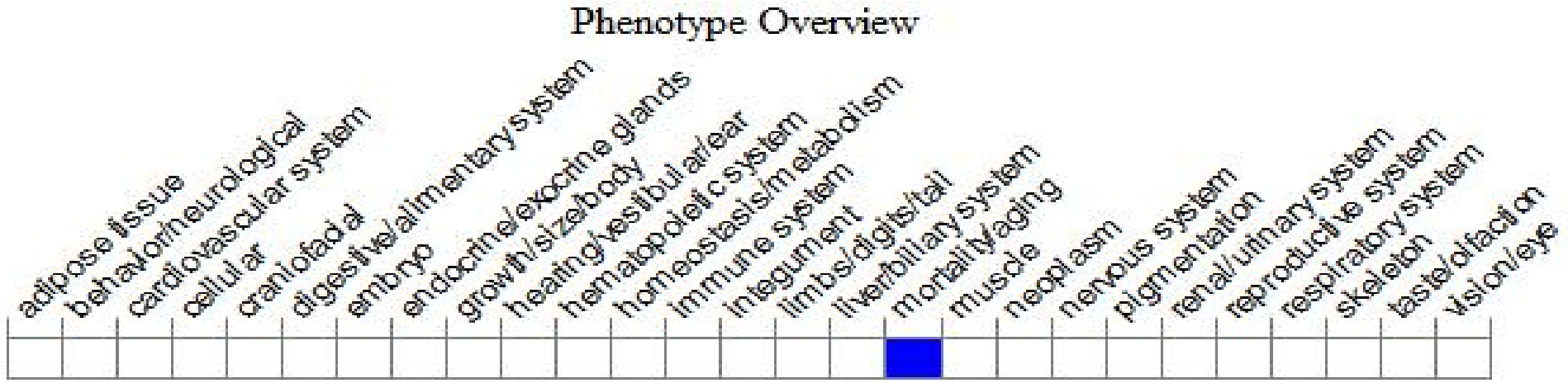
Source: : https://www.ensembl.org

Protein Information



Source: : https://www.ensembl.org

Mouse Phenotype Information (MGI)



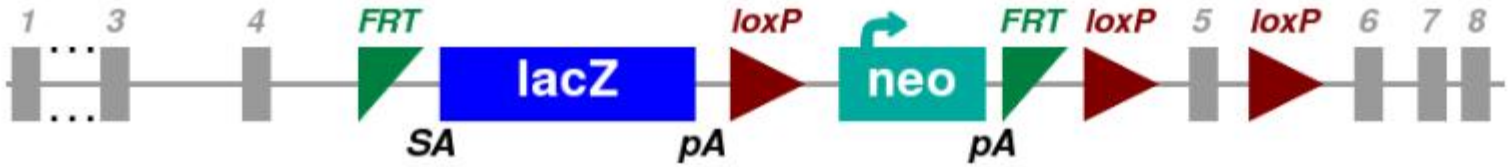
Source: https://www.informatics.jax.org

Important Information

- According to the existing MGI data: homozygous mice die during preweaning stage.
- The transcript-205 is directly destroyed.
- The transcript-202 is not affected.
- *Atp5pb* is located on Chr3. If the knockout mice are crossed with other mouse strains to obtain double homozygous mutant offspring, please avoid the situation that the second gene is on the same chromosome.
- This Strategy is designed based on genetic information in existing databases. Due to the complexity of biological processes, all risks of the mutation on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

Reference

	MGI Allele	Allele Type	Produced
−	Atp5pb$^{tm1a(EUCOMM)Wtsi}$	KO first allele (reporter-tagged insertion with conditional potential)	Mice, Targeting vectors, ES Ce



Mice (1) | ES Cells (7) | Targeting Vectors (3) | Tissues (0)

https://www.mousephenotype.org/data/genes/MGI:1100495