

Atp7b Cas9-KO Strategy

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Reviewer:

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Design Date:

2019-9-5

Project Overview

Project Name

Atp7b

Project type

Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Atp7b* gene. The schematic diagram is as follows:



- The *Atp7b* gene has 2 transcripts. According to the structure of *Atp7b* gene, exon2 of *Atp7b-201* (ENSMUST00000006742.10) transcript is recommended as the knockout region. The region contains 1207bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Atp7b* gene. The brief process is as follows: CRISPR/Cas9 system

- According to the existing MGI data, Targeted disruption of the mouse gene results in copper accumulation in various organs, primarily the liver, kidney and brain, and a form of liver cirrhosis that resembles Wilson disease in humans and the toxic milk phenotype in mice.
- The *Atp7b* gene is located on the Chr8. 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)

Atp7b ATPase, Cu⁺⁺ transporting, beta polypeptide [Mus musculus (house mouse)]

Gene ID: 11979, updated on 3-Feb-2019

Summary



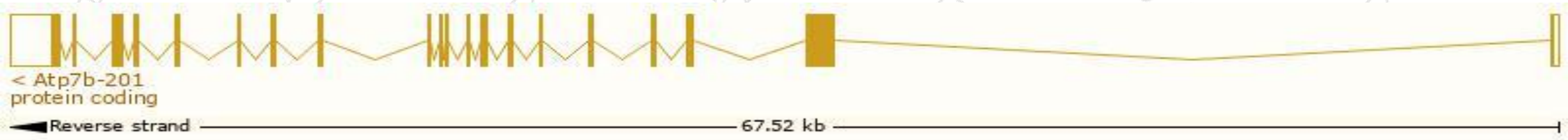
Official Symbol	Atp7b provided by MGI
Official Full Name	ATPase, Cu ⁺⁺ transporting, beta polypeptide provided by MGI
Primary source	MGI:MGI:103297
See related	Ensembl:ENSMUSG00000006567
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Atp7a, WND, tx
Expression	Broad expression in placenta adult (RPKM 9.8), lung adult (RPKM 9.6) and 16 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

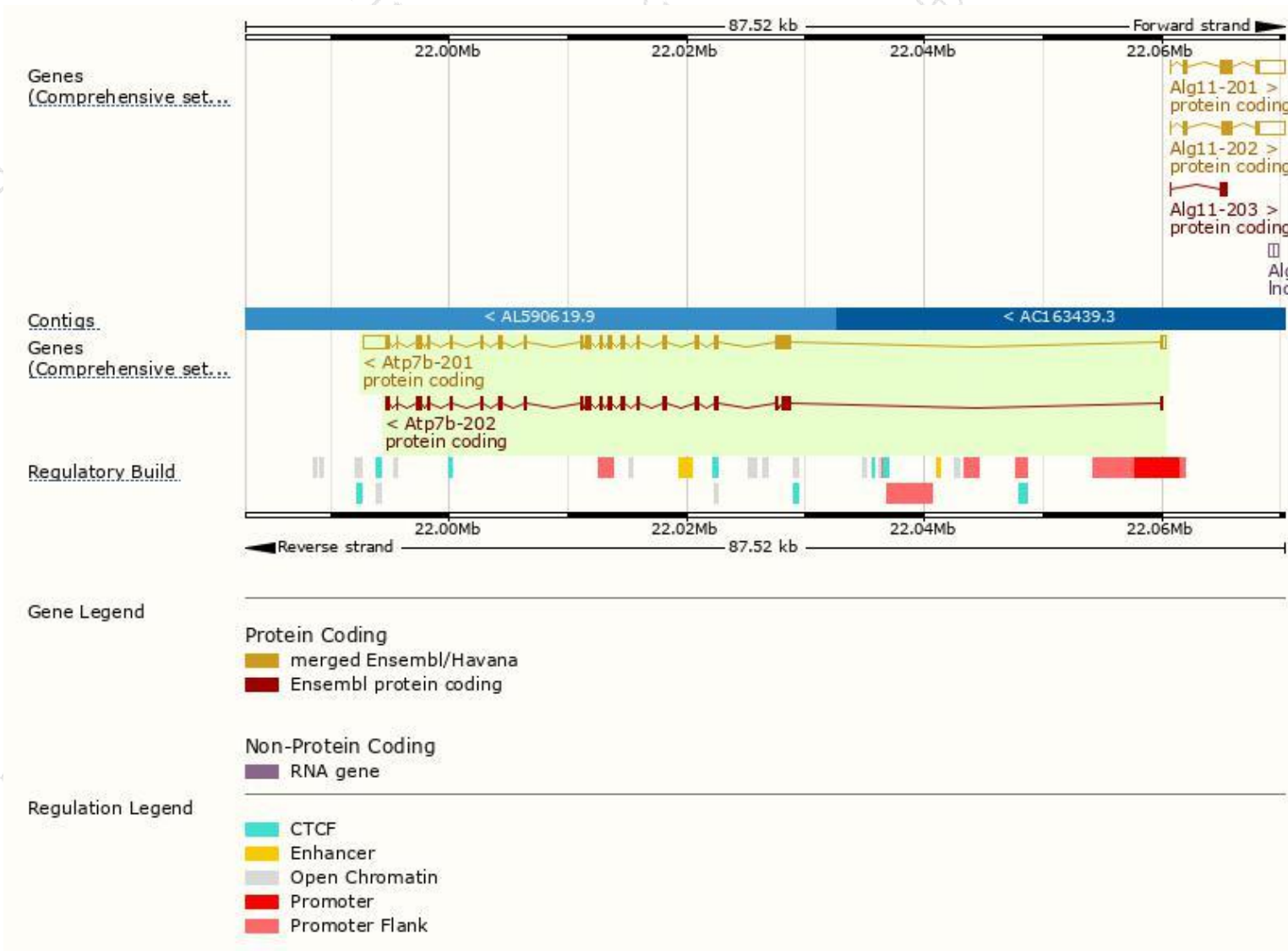
The gene has 2 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Atp7b-201	ENSMUST00000006742.10	6505	1462aa	Protein coding	CCDS22168	Q64446	TSL:1 GENCODE basic APPRIS P2
Atp7b-202	ENSMUST00000110738.2	4044	1347aa	Protein coding	-	B1AQ57	TSL:5 GENCODE basic APPRIS ALT2

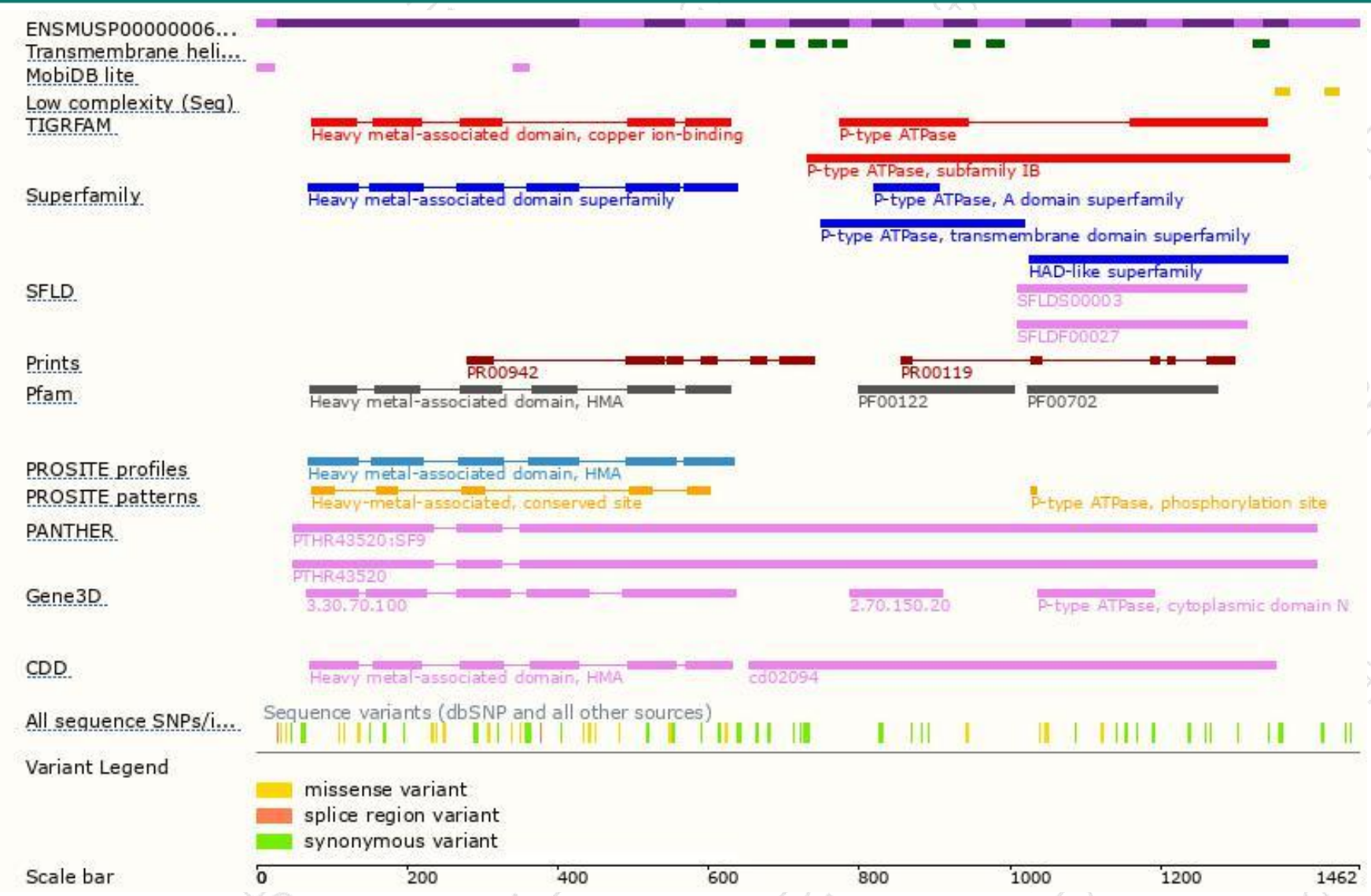
The strategy is based on the design of *Atp7b-201* transcript,The transcription is shown below



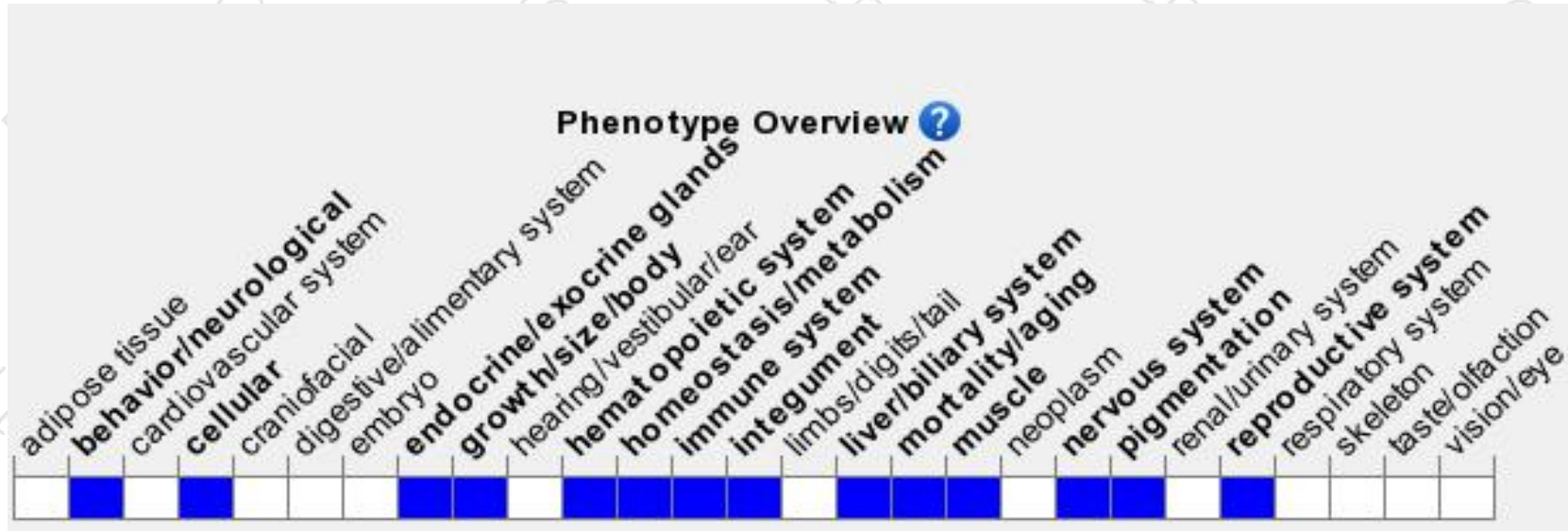
Genomic location distribution



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, Targeted disruption of the mouse gene results in copper accumulation in various organs, primarily the liver, kidney and brain, and a form of liver cirrhosis that resembles Wilson disease in humans and the toxic milk phenotype in mice.

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

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