

Ucp1 Cas9-KO Strategy

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Reviewer:

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Project Overview

Project Name

Ucp1

Project type

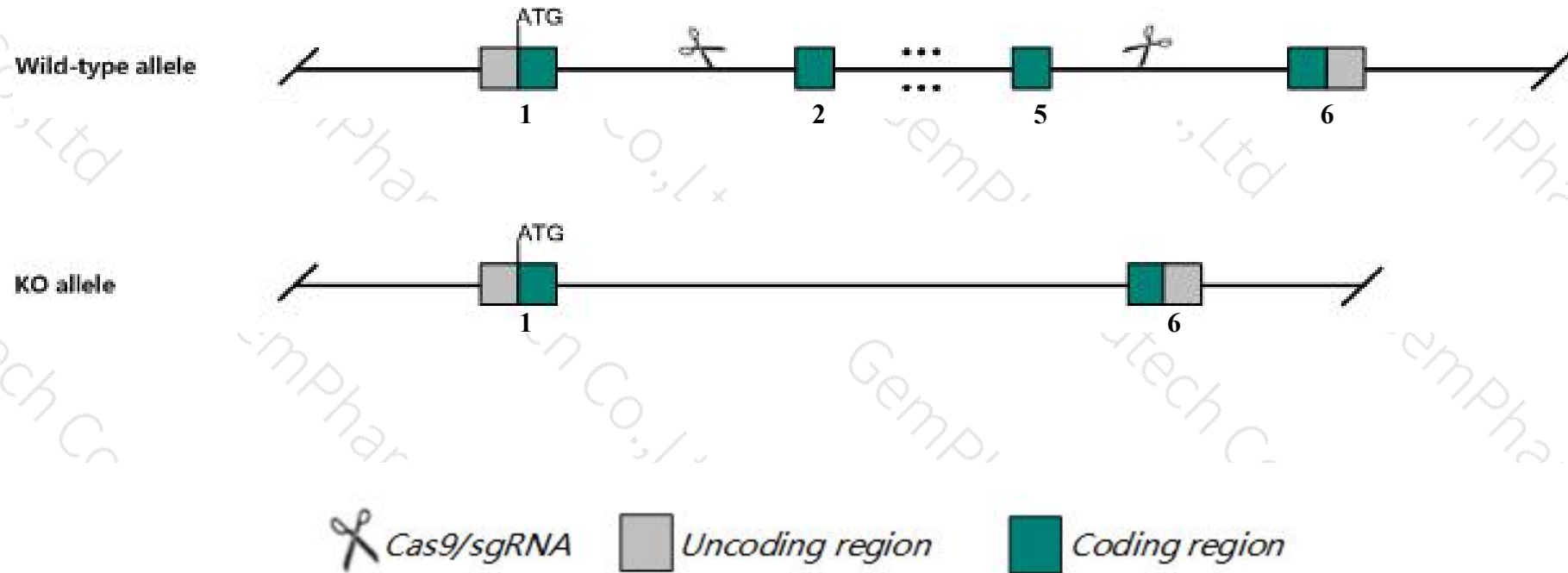
Cas9-KO

Strain background

C57BL/6J

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Ucp1* gene. The schematic diagram is as follows:



- The *Ucp1* gene has 1 transcript. According to the structure of *Ucp1* gene, exon2-exon5 of *Ucp1-201* (ENSMUST00000034146.4) transcript is recommended as the knockout region. The region contains 683bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Ucp1* 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.

- According to the existing MGI data, Homozygous null mutants exhibit impaired thermoregulation on some genetic backgrounds. Biochemical alterations in brown fat mitochondria are also observed.
- The *Ucp1* 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)

Ucp1 uncoupling protein 1 (mitochondrial, proton carrier) [Mus musculus (house mouse)]

Gene ID: 22227, updated on 9-Apr-2019

Summary



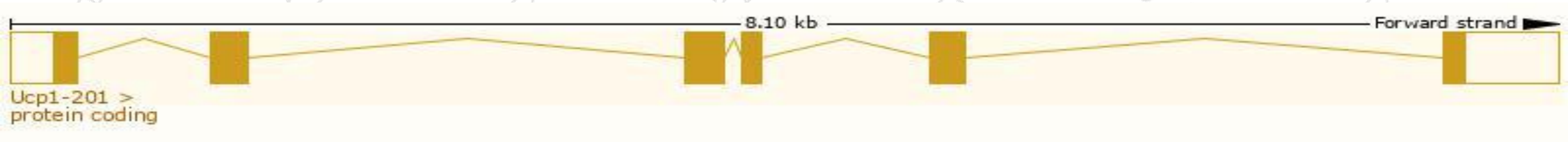
Official Symbol	Ucp1 provided by MGI
Official Full Name	uncoupling protein 1 (mitochondrial, proton carrier) provided by MGI
Primary source	MGI:MGI:98894
See related	Ensembl:ENSMUSG00000031710
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	AI385626, Slc25a7, Ucp
Expression	Biased expression in adrenal adult (RPKM 353.2), mammary gland adult (RPKM 206.4) and 5 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

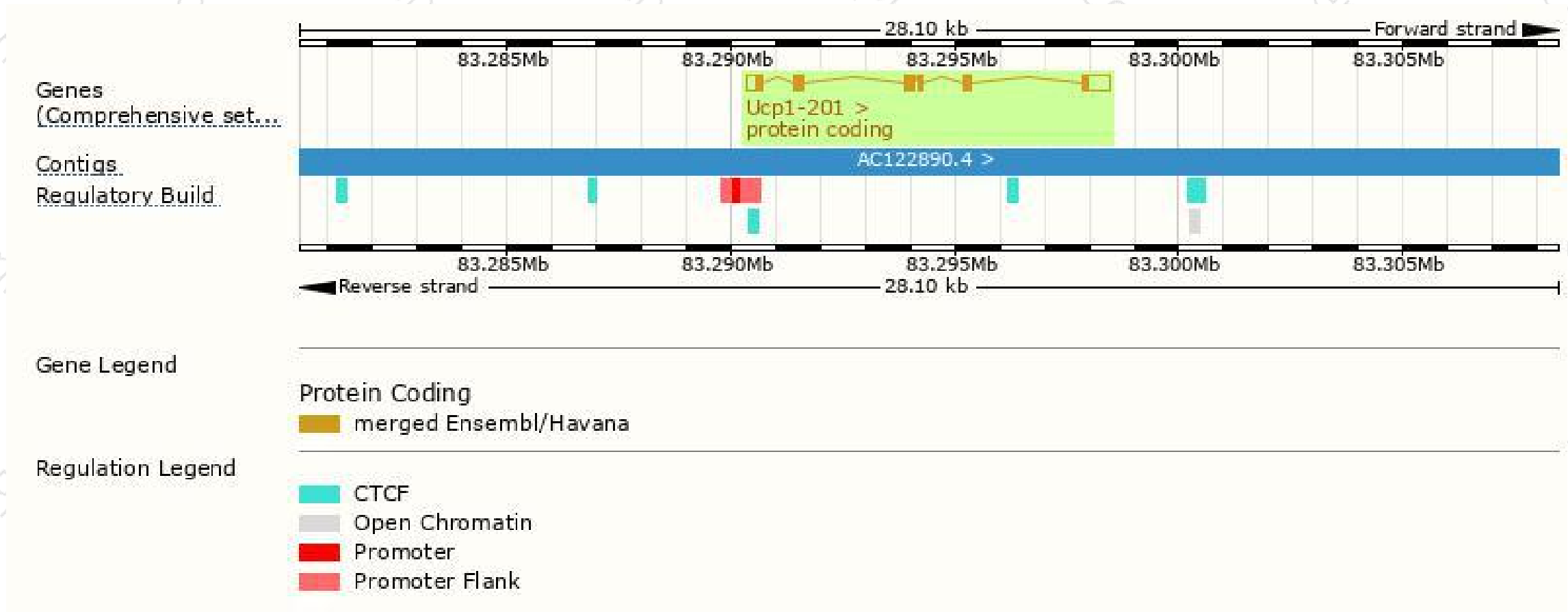
The gene has 1 transcript, and the transcript is shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Ucp1-201	ENSMUST00000034146.4	1636	307aa	Protein coding	CCDS22449	P12242	TSL:1 GENCODE basic APPRIS P1

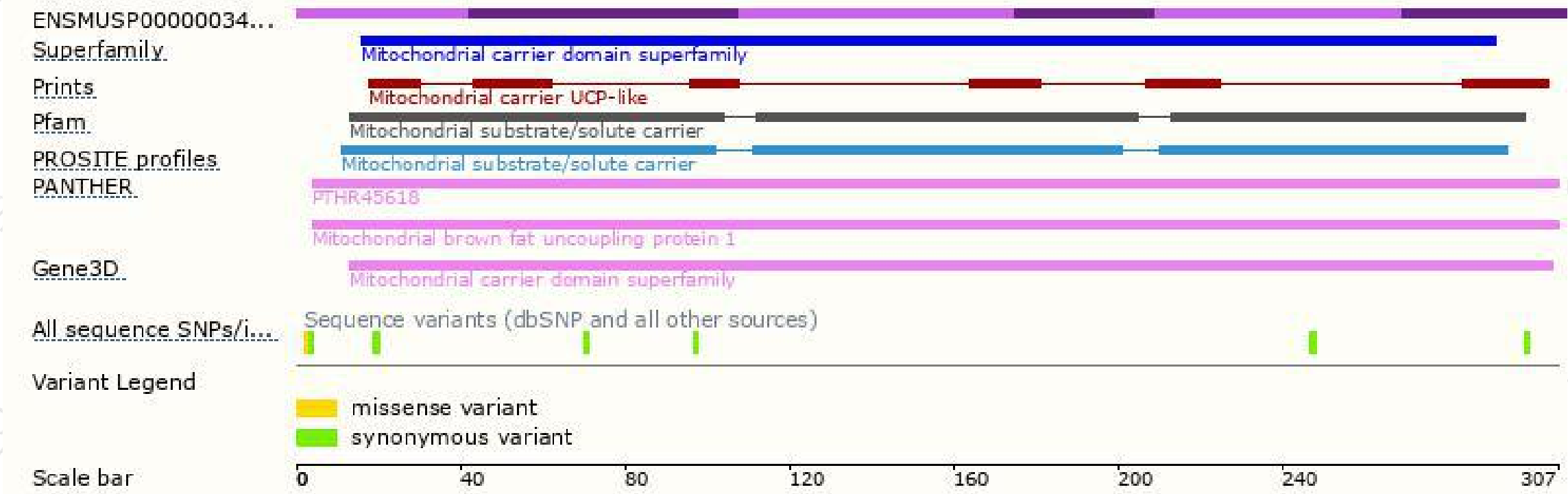
The strategy is based on the design of *Ucp1-201* transcript, The transcription is shown below



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, Homozygous null mutants exhibit impaired thermoregulation on some genetic backgrounds. Biochemical alterations in brown fat mitochondria are also observed.

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

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