Ucp3 Cas9-CKO Strategy

Designer: Huan Wang
Reviewer: Huan Fan
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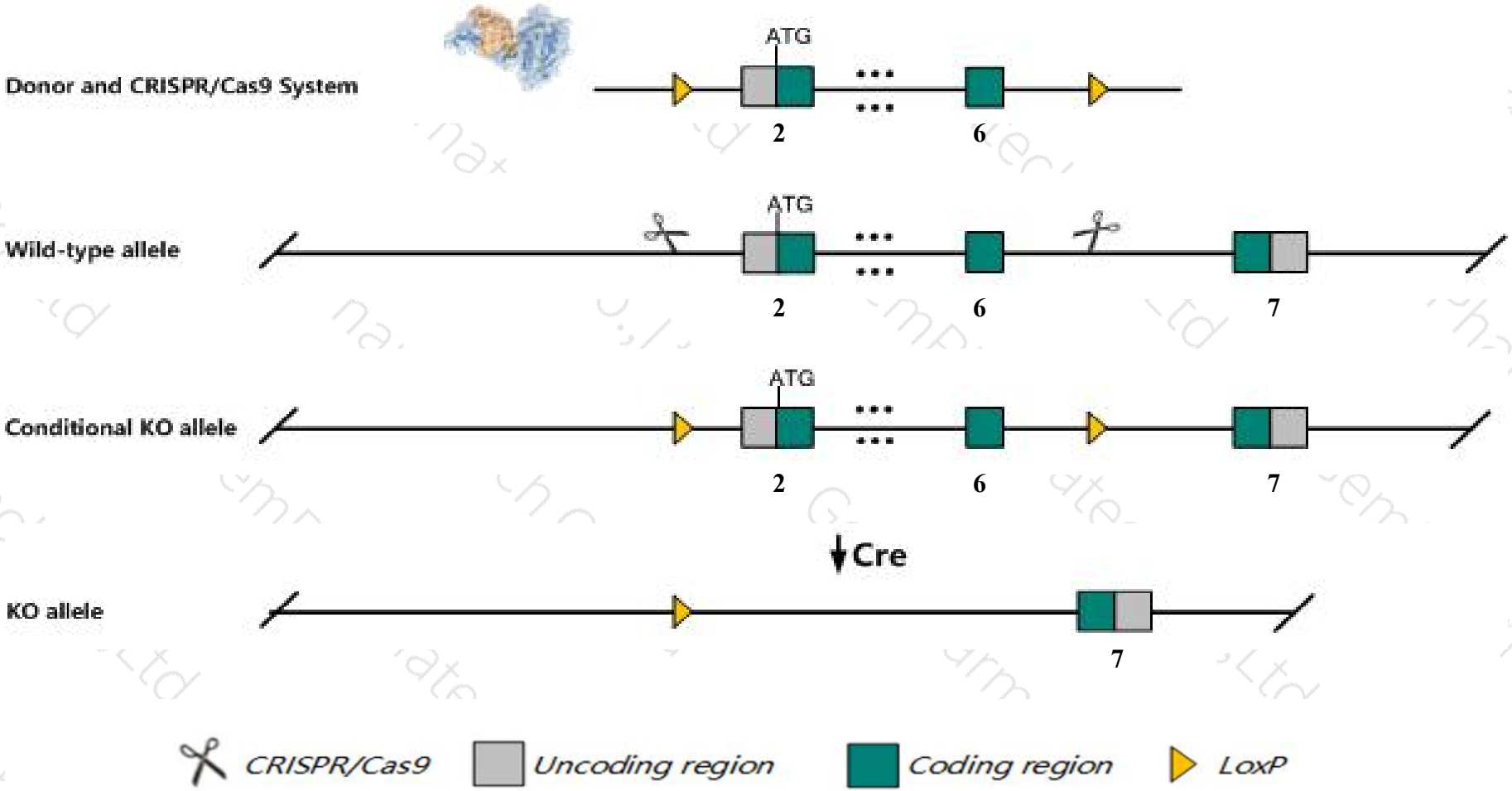
Project Overview

Project Name	***Ucp3***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Ucp3* gene. The schematic diagram is as follows:



Technical routes

- The *Ucp3* gene has 4 transcripts. According to the structure of *Ucp3* gene, exon2-exon6 of *Ucp3-201* (ENSMUST00000032958.13) 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 *Ucp3* 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

- According to the existing MGI data,Homozygous null mutants exhibit a lack of superoxide-induced uncoupling in skeletal muscle mitochondria, accompanied by increased reactive oxygen species formation.

- The *Ucp3* gene is located on the Chr7. 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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Ucp3 uncoupling protein 3 (mitochondrial, proton carrier) [Mus musculus (house mouse)]

Gene ID: 22229, updated on 9-Apr-2019

Summary

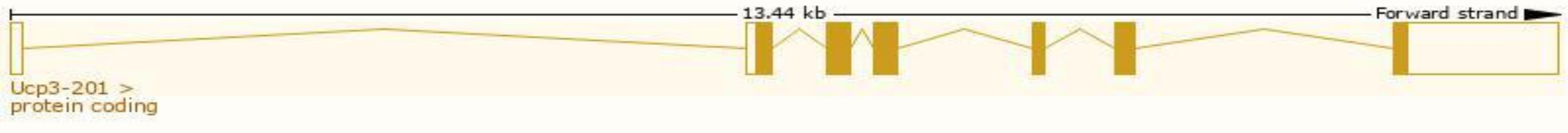
Official Symbol	Ucp3 provided by MGI
Official Full Name	uncoupling protein 3 (mitochondrial, proton carrier) provided by MGI
Primary source	MGI:MGI:1099787
See related	Ensembl:ENSMUSG00000032942
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	AI645527, Slc25a9, UCP-3
Expression	Biased expression in mammary gland adult (RPKM 11.6), heart adult (RPKM 10.8) and 10 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

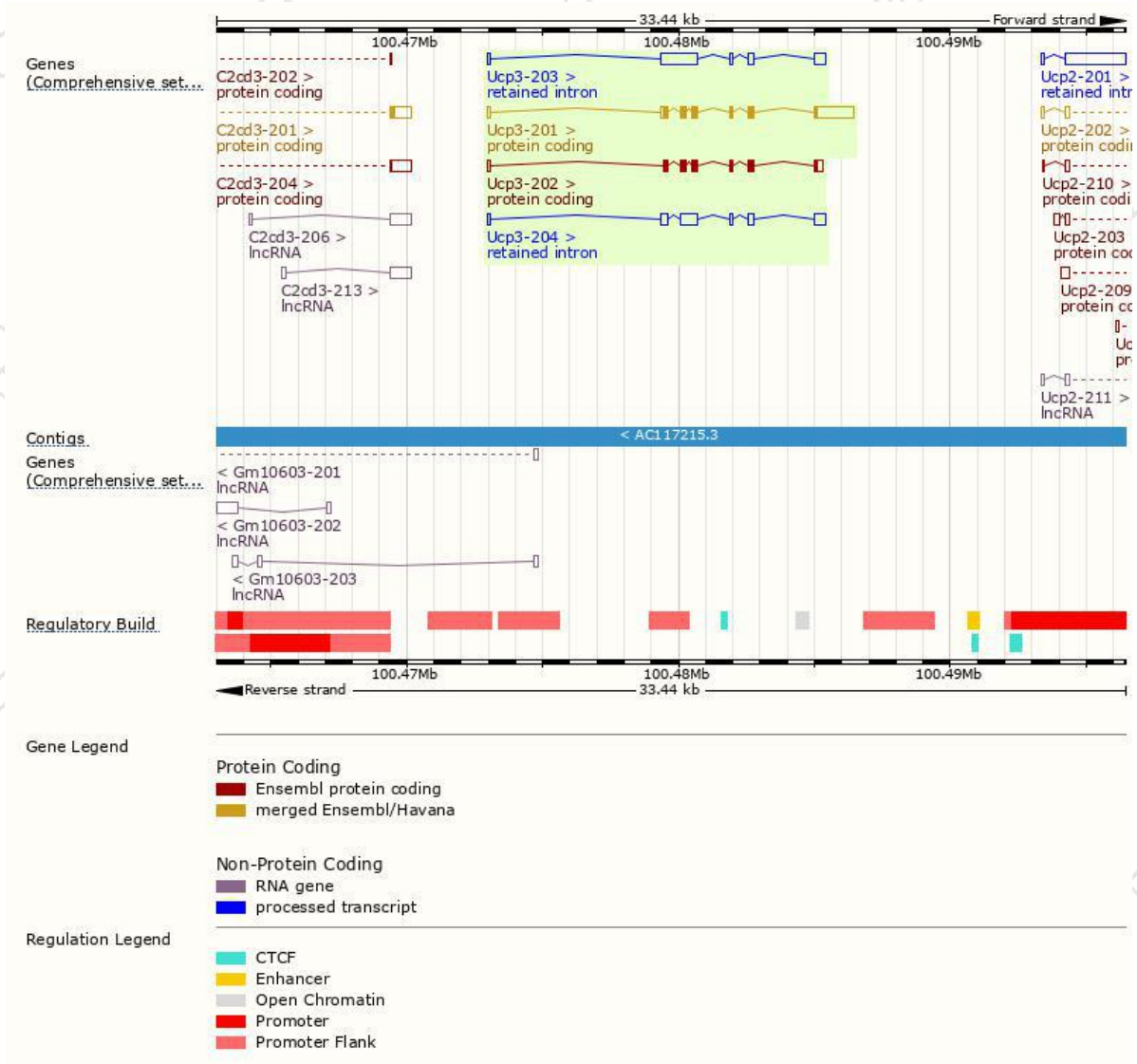
The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Ucp3-201	ENSMUST00000032958.13	2448	308aa	Protein coding	CCDS21497	B2RTM2 P56501	TSL:1 GENCODE basic APPRIS P1
Ucp3-202	ENSMUST00000107059.1	1260	308aa	Protein coding	CCDS21497	B2RTM2 P56501	TSL:5 GENCODE basic APPRIS P1
Ucp3-203	ENSMUST00000128044.7	2129	No protein	Retained intron	-	-	TSL:1
Ucp3-204	ENSMUST00000133850.1	1615	No protein	Retained intron	-	-	TSL:1

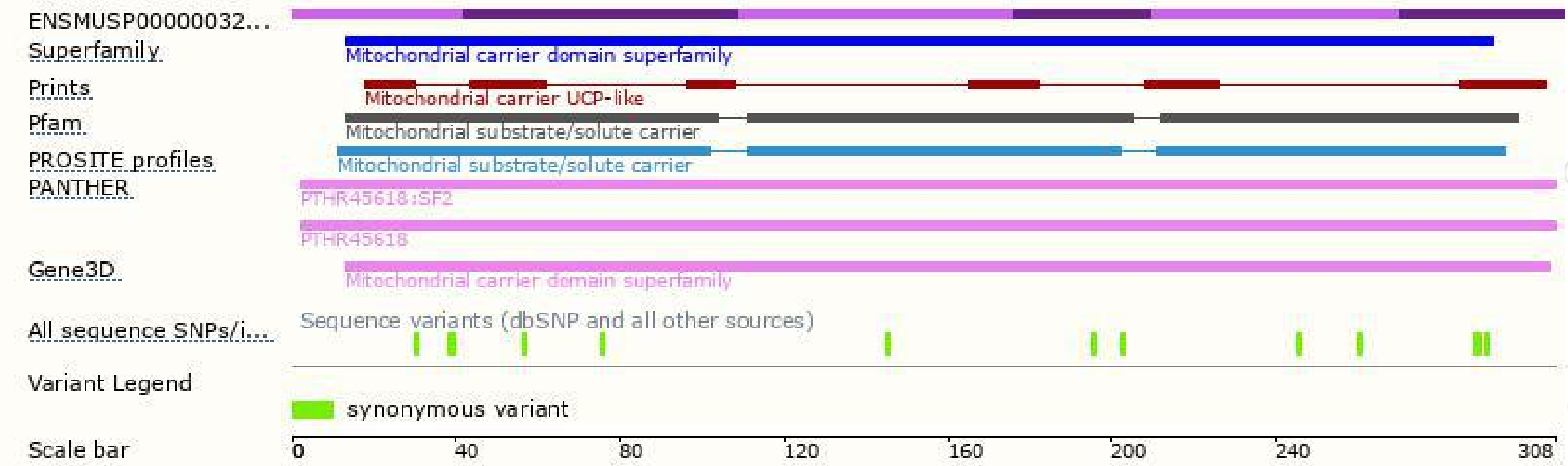
The strategy is based on the design of *Ucp3-201* transcript,The transcription is shown below



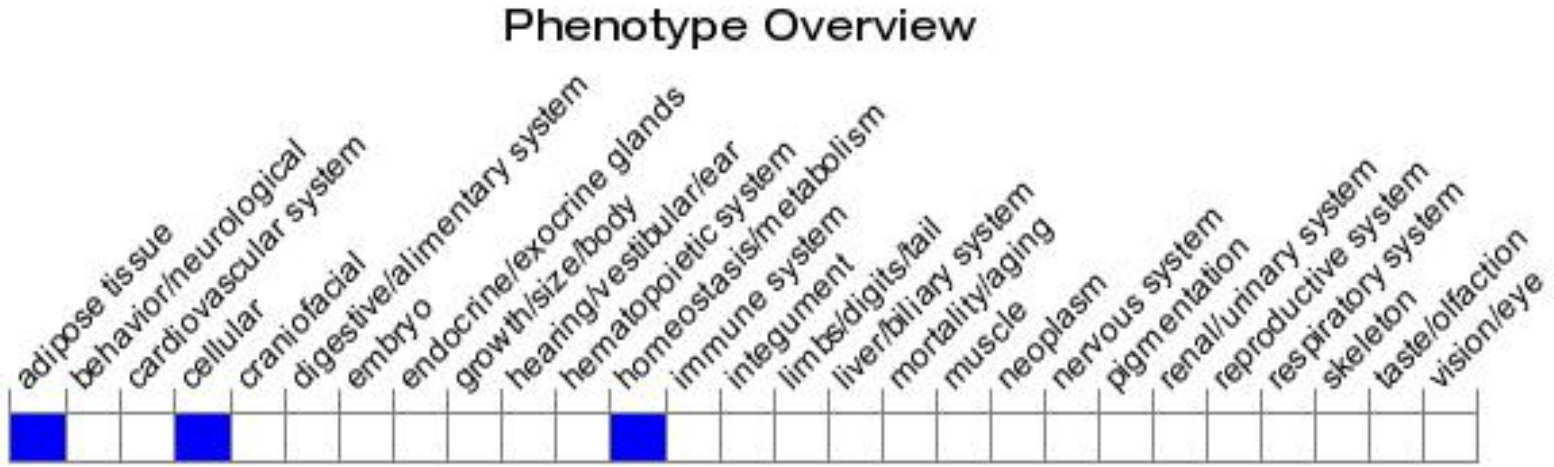
Genomic location distribution



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 a lack of superoxide-induced uncoupling in skeletal muscle mitochondria, accompanied by increased reactive oxygen species formation.

集萃药康
GemPharmatech

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

Tel: 400-9660890

集萃药康生物科技
GemPharmatech Co.,Ltd