# *Mpc2* Cas9-KO Strategy

**Designer: Xueting Zhang**

**Reviewer: Daohua Xu**

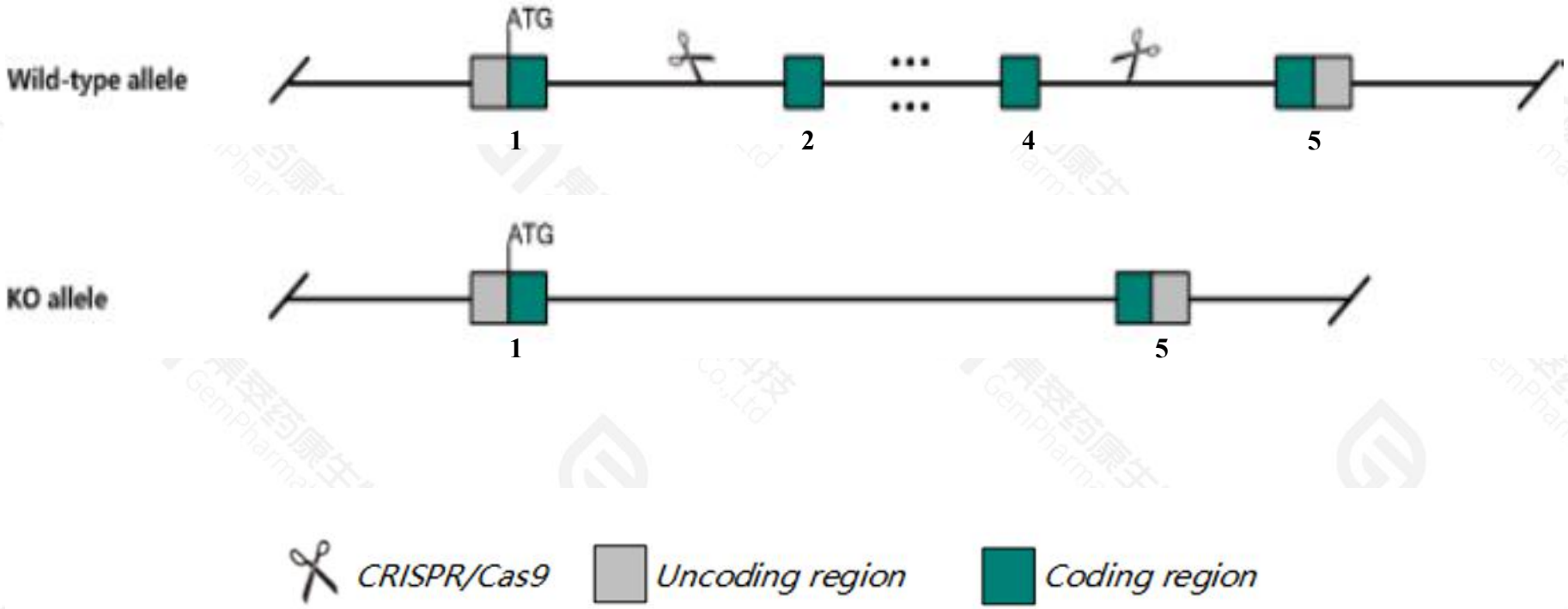
**Design Date: 2021-5-7**

# Project Overview

| | |
|---|---|
| **Project Name** | ***Mpc2*** |
| **Project type** | **Cas9-KO** |
| **Strain background** | **C57BL/6JGpt** |

# Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Mpc2* gene. The schematic diagram is as follows:



# Technical routes

➢ The *Mpc2* gene has 5 transcripts. According to the structure of *Mpc2* gene, exon2-exon4 of *Mpc2-201*(ENSMUST00000027853.6) transcript is recommended as the knockout region.The region contains 238bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Mpc2* gene. The brief process is as follows: CRISPR/Cas9 system 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.

# Notice

➢ According to the existing MGI data,mice homozygous for a null allele die during organogenesis. Mice homozygous for a truncated allele display defects in mitochondrial physiology and impaired glucose-stimulated insulin secretion.

➢ Transcript *Mpc2-205* may be unaffected.

➢ The *Mpc2* gene is located on the Chr1. 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）

集萃药康 GemPharmatech

## Mpc2 mitochondrial pyruvate carrier 2 [Mus musculus (house mouse)]

Gene ID: 70456, updated on 3-Jan-2021

### Summary

| | |
|---|---|
| **Official Symbol** | Mpc2 provided by MGI |
| **Official Full Name** | mitochondrial pyruvate carrier 2 provided by MGI |
| **Primary source** | MGI:MGI:1917706 |
| **See related** | Ensembl:ENSMUSG00000026568 |
| **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** | 0610006C01Rik, 2010002I07Rik, 2610205H19Rik, AA108335, Brp, Brp44, ESTM4, ESTM43 |
| **Expression** | Ubiquitous expression in adrenal adult (RPKM 132.5), testis adult (RPKM 127.7) and 28 other tissues See more |
| **Orthologs** | human all |

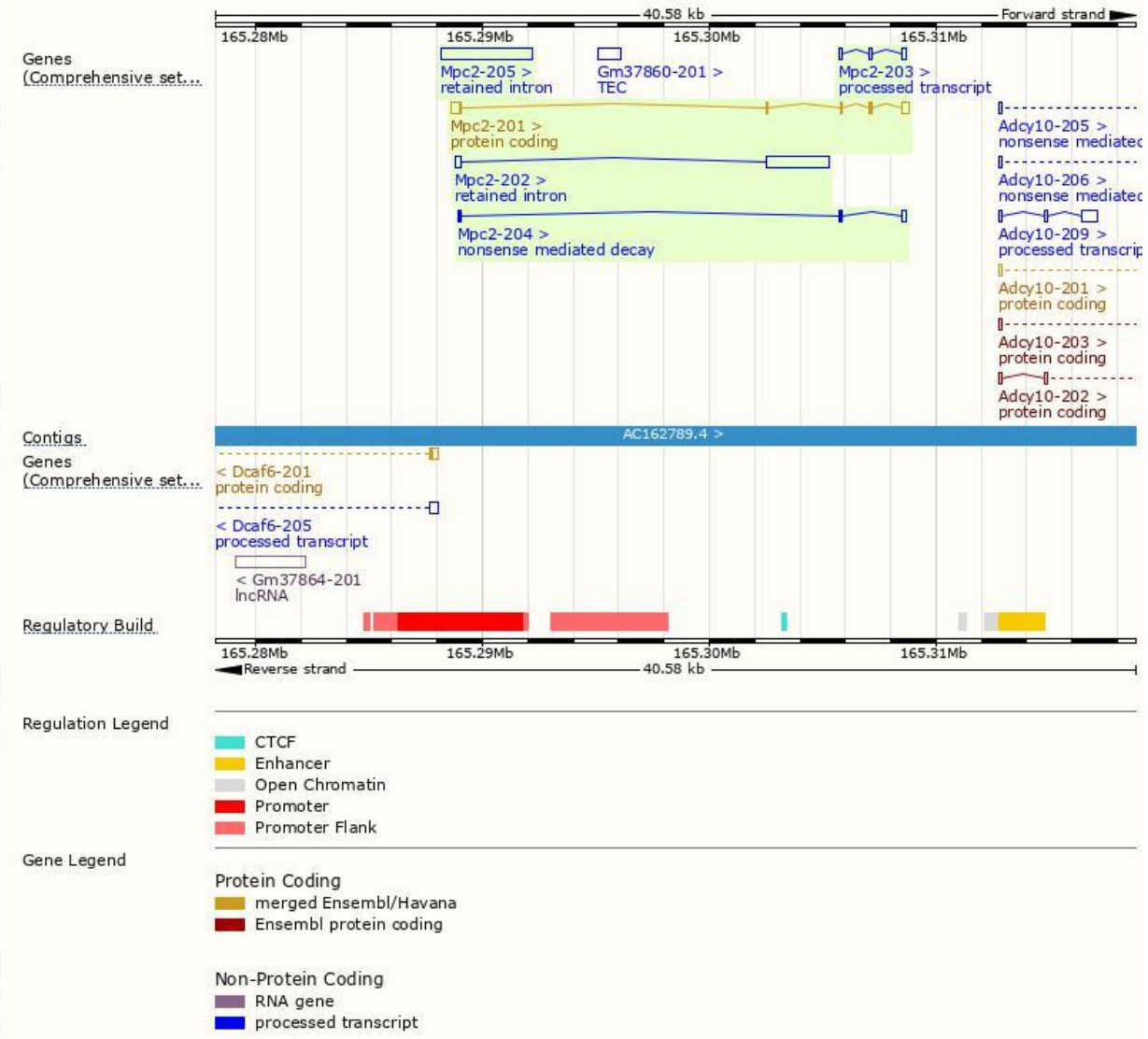
# Transcript information（Ensembl）

The gene has 5 transcripts,all transcripts are shown below:

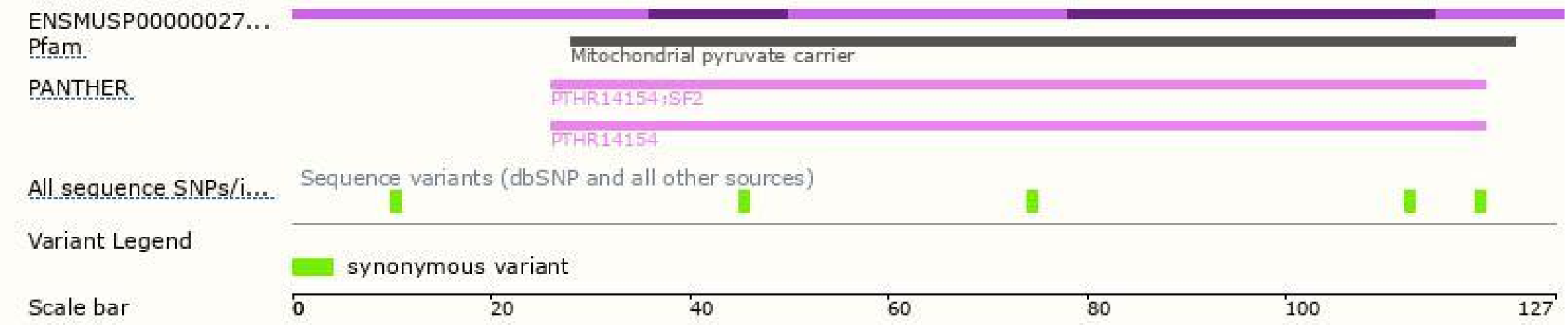
| Name | Transcript ID | bp | Protein | Biotype | CCDS | UniProt | Flags |
|---|---|---|---|---|---|---|---|
| **Mpc2-201** | ENSMUST00000027853.6 | 1025 | 127aa | Protein coding | CCDS15442 | | TSL:1 , GENCODE basic , APPRIS P1 , |
| **Mpc2-204** | ENSMUST00000193575.2 | 468 | 41aa | Nonsense mediated decay | - | | TSL:5 , |
| **Mpc2-203** | ENSMUST00000138999.2 | 493 | No protein | Processed transcript | - | | TSL:2 , |
| **Mpc2-205** | ENSMUST00000195026.2 | 4015 | No protein | Retained intron | - | | TSL:NA , |
| **Mpc2-202** | ENSMUST00000128633.2 | 3029 | No protein | Retained intron | - | | TSL:1 , |

The strategy is based on the design of *Mpc2-201* transcript,the transcription is shown below:

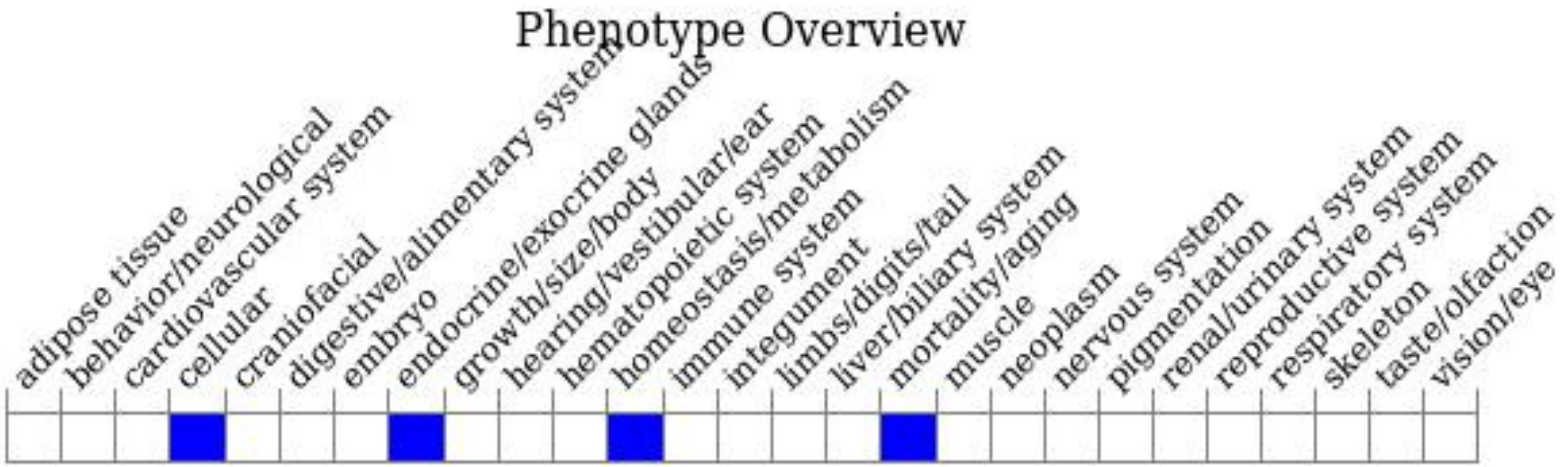
# Genomic location distribution



# 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,mice homozygous for a null allele die during organogenesis. Mice homozygous for a truncated allele display defects in mitochondrial physiology and impaired glucose-stimulated insulin secretion.

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