

# ***Fgf21 Cas9-KO Strategy***

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**Reviewer :**

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# Project Overview

**Project Name**

***Fgf21***

**Project type**

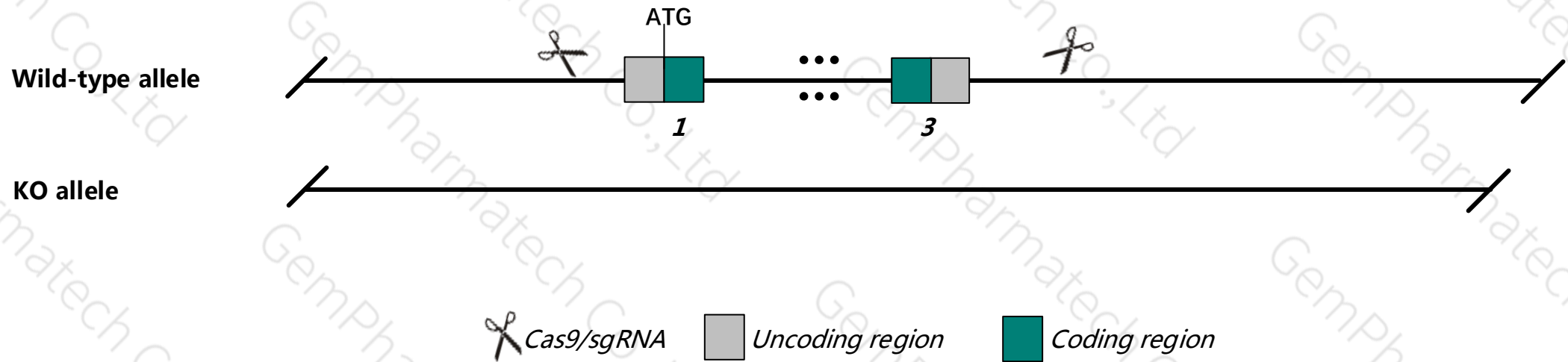
**Cas9-KO**

**Strain background**

**C57BL/6JGpt**

# Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Fgf21* gene. The schematic diagram is as follows:



# Technical routes

- The *Fgf21* gene has 1 transcript. According to the structure of *Fgf21* gene, exon1-exon3 of *Fgf21*-201 (ENSMUST00000033099.5) transcript is recommended as the knockout region. The region contains all of the coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Fgf21* gene. The brief process is as follows: sgRNA was transcribed in vitro. Cas9, sgRNA 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.

- According to the existing MGI data , Mice homozygous for a null allele exhibit decreased circulating glucose levels, oxygen consumption, and gluconeogenesis in fasted mice and increased circulating ketone levels in fed mice.
- This strategy may affect the 5-terminal regulation of itself and *Fut1* gene.
- The *Fgf21* 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 the gene knockout on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

# Gene information ( NCBI )

## Fgf21 fibroblast growth factor 21 [ *Mus musculus* (house mouse) ]

Gene ID: 56636, updated on 31-Dec-2019

### Summary

Official Symbol	Fgf21 provided by <a href="#">MGI</a>
Official Full Name	fibroblast growth factor 21 provided by <a href="#">MGI</a>
Primary source	<a href="#">MGI:MGI:1861377</a>
See related	<a href="#">Ensembl:ENSMUSG00000030827</a>
Gene type	protein coding
RefSeq status	VALIDATED
Organism	<a href="#">Mus musculus</a>
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Expression	Biased expression in thymus adult (RPKM 4.0), testis adult (RPKM 1.7) and 11 other tissues <a href="#">See more</a>
Orthologs	<a href="#">human</a> <a href="#">all</a>

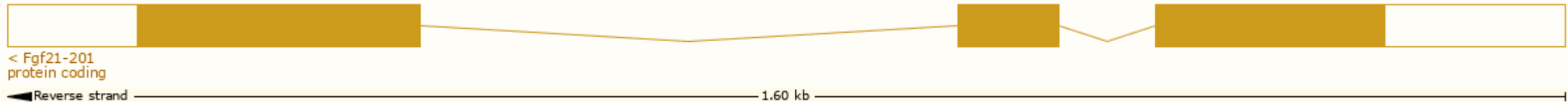
# Transcript information ( Ensembl )



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

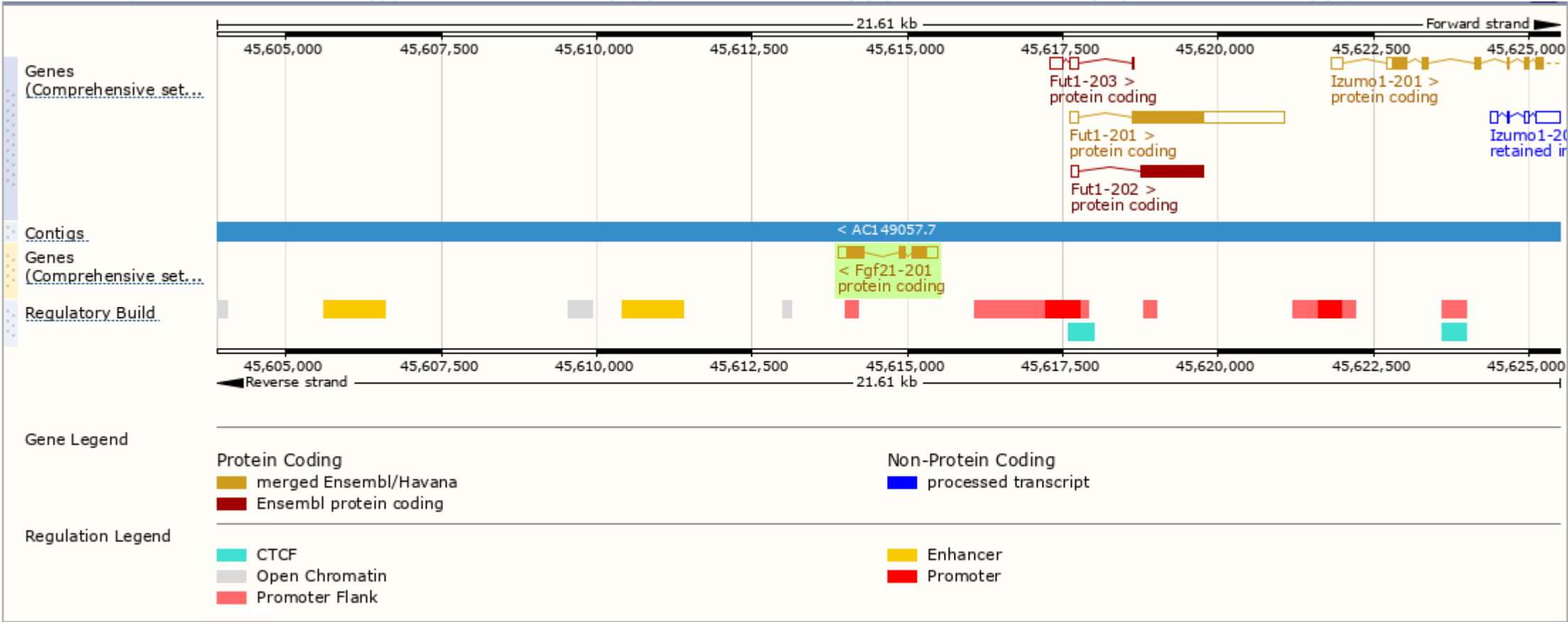
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Fgf21-201	<a href="#">ENSMUST00000033099.5</a>	951	<a href="#">210aa</a>	Protein coding	<a href="#">CCDS21253</a>	<a href="#">Q9JJN1</a>	TSL:1 Gencode basic APPRIS P1

The strategy is based on the design of *Fgf21*-201 transcript, The transcription is shown below



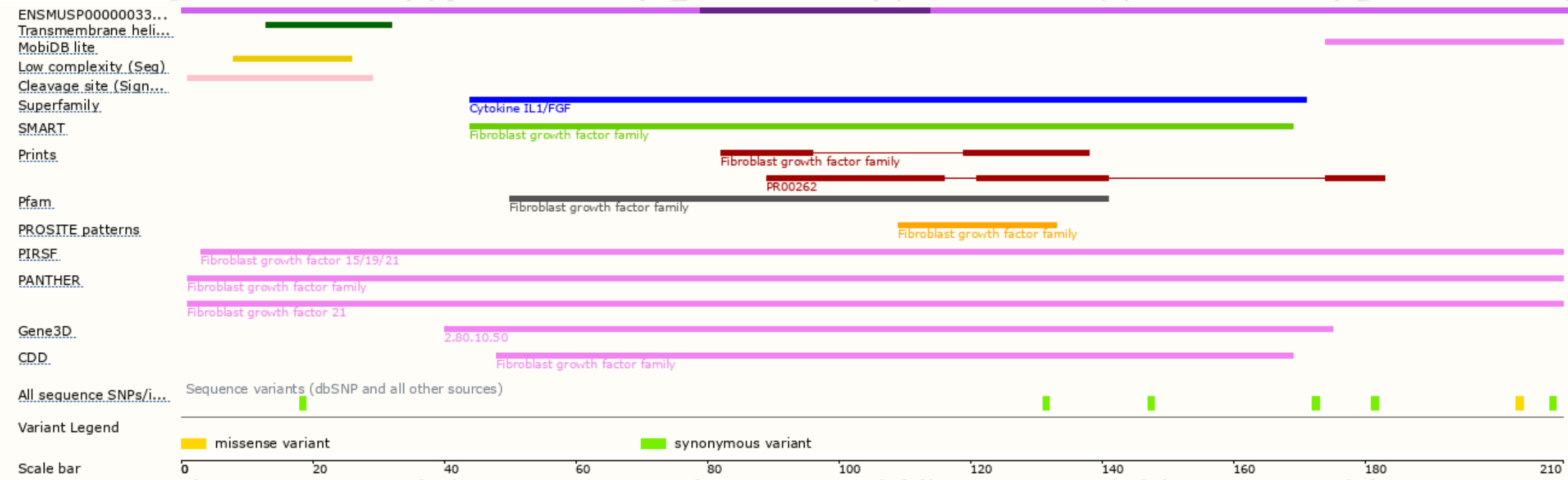


# Genomic location distribution



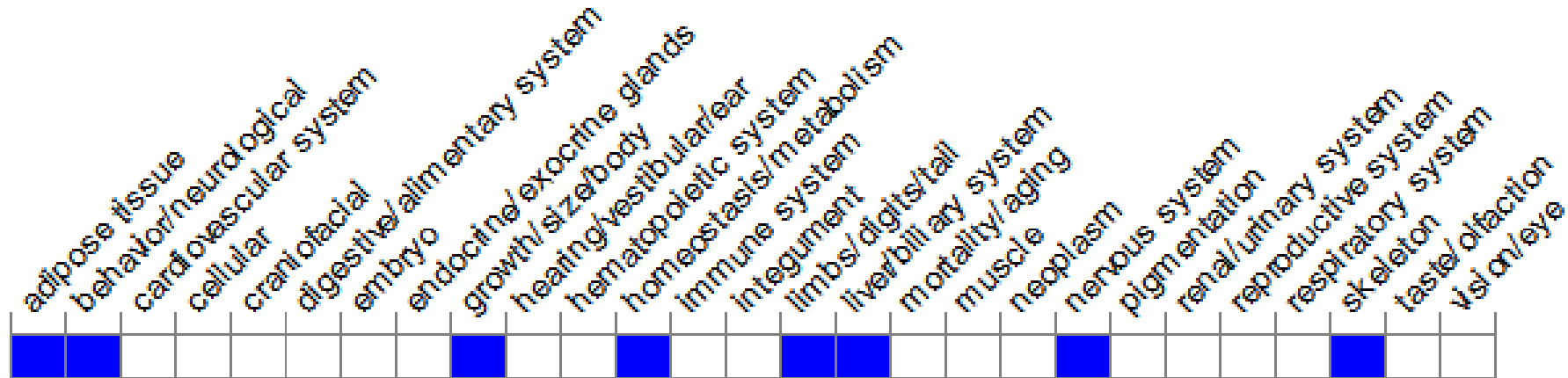


# Protein domain



# Mouse phenotype description(MGI)

## Phenotype Overview ?



Click cells to view annotations.

*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 exhibit decreased circulating glucose levels, oxygen consumption, and gluconeogenesis in fasted mice and increased circulating ketone levels in fed mice.

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