

# *C1qtnf2* Cas9-KO Strategy

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# Project Overview

**Project Name**

*C1qtnf2*

**Project type**

**Cas9-KO**

**Strain background**

**C57BL/6JGpt**

# Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Clqtnf2* gene. The schematic diagram is as follows:



- The *Clqtnf2* gene has 3 transcripts. According to the structure of *Clqtnf2* gene, exon3 of *Clqtnf2*-201(ENSMUST00000057679.9) transcript is recommended as the knockout region. The region contains 253bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Clqtnf2* gene. The brief process is as follows: sgRNA was transcribed in vitro. Cas9 and 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 knock-out allele show decreased body weight, reduced adiposity, increased metabolic rate and energy expenditure, enhanced adipose tissue lipolysis, and altered hepatic and plasma lipid profiles.
- The *C1qtnf2* gene is located on the Chr11. 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)

## C1qtnf2 C1q and tumor necrosis factor related protein 2 [Mus musculus (house mouse)]

Gene ID: 69183, updated on 13-Mar-2020

### Summary



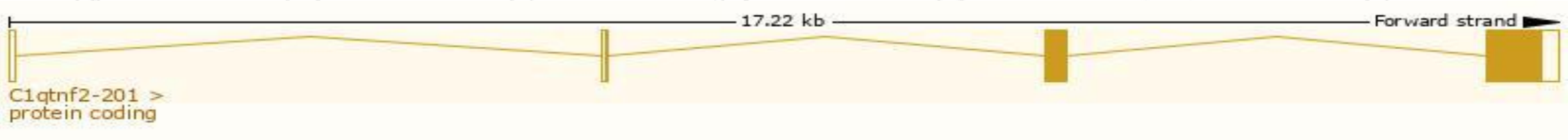
<b>Official Symbol</b>	C1qtnf2 provided by <a href="#">MGI</a>
<b>Official Full Name</b>	C1q and tumor necrosis factor related protein 2 provided by <a href="#">MGI</a>
<b>Primary source</b>	<a href="#">MGI:MGI:1916433</a>
<b>See related</b>	<a href="#">Ensembl:ENSMUSG00000046491</a>
<b>Gene type</b>	protein coding
<b>RefSeq status</b>	VALIDATED
<b>Organism</b>	<a href="#">Mus musculus</a>
<b>Lineage</b>	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
<b>Also known as</b>	1810033K05Rik, Adih, CTRP2
<b>Expression</b>	Broad expression in lung adult (RPKM 20.0), bladder adult (RPKM 18.2) and 16 other tissues <a href="#">See more</a>
<b>Orthologs</b>	<a href="#">human</a> <a href="#">all</a>

# Transcript information (Ensembl)

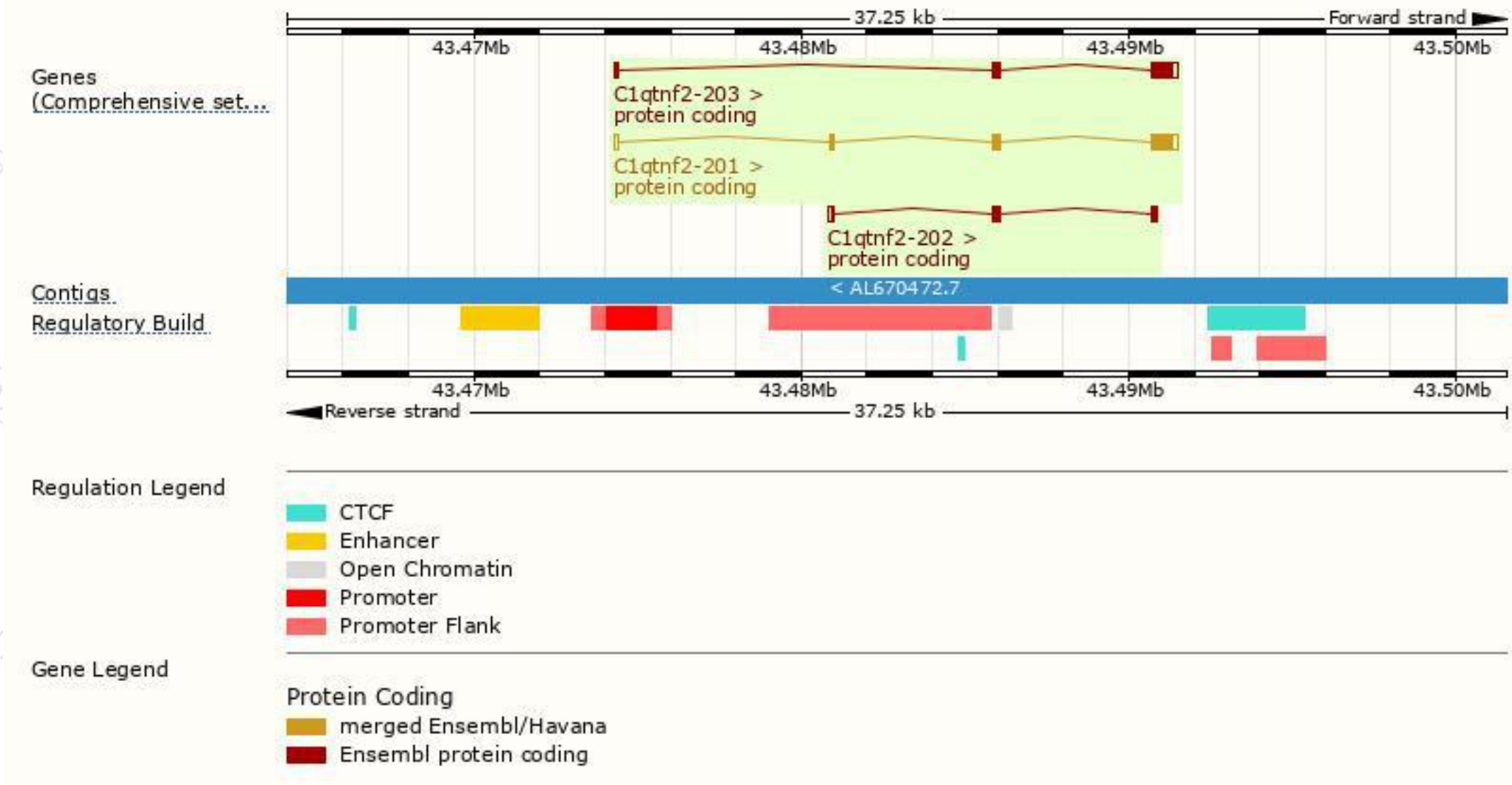
The gene has 3 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
C1qtnf2-201	<a href="#">ENSMUST00000057679.9</a>	1211	<a href="#">294aa</a>	Protein coding	<a href="#">CCDS24558</a>	<a href="#">Q9D8U4</a>	TSL:1 GENCODE basic APPRIS P2
C1qtnf2-203	<a href="#">ENSMUST00000173002.7</a>	1147	<a href="#">324aa</a>	Protein coding	-	<a href="#">G3V001</a>	TSL:5 GENCODE basic APPRIS ALT2
C1qtnf2-202	<a href="#">ENSMUST00000151912.1</a>	535	<a href="#">137aa</a>	Protein coding	-	<a href="#">G3UXA9</a>	CDS 3' incomplete TSL:1

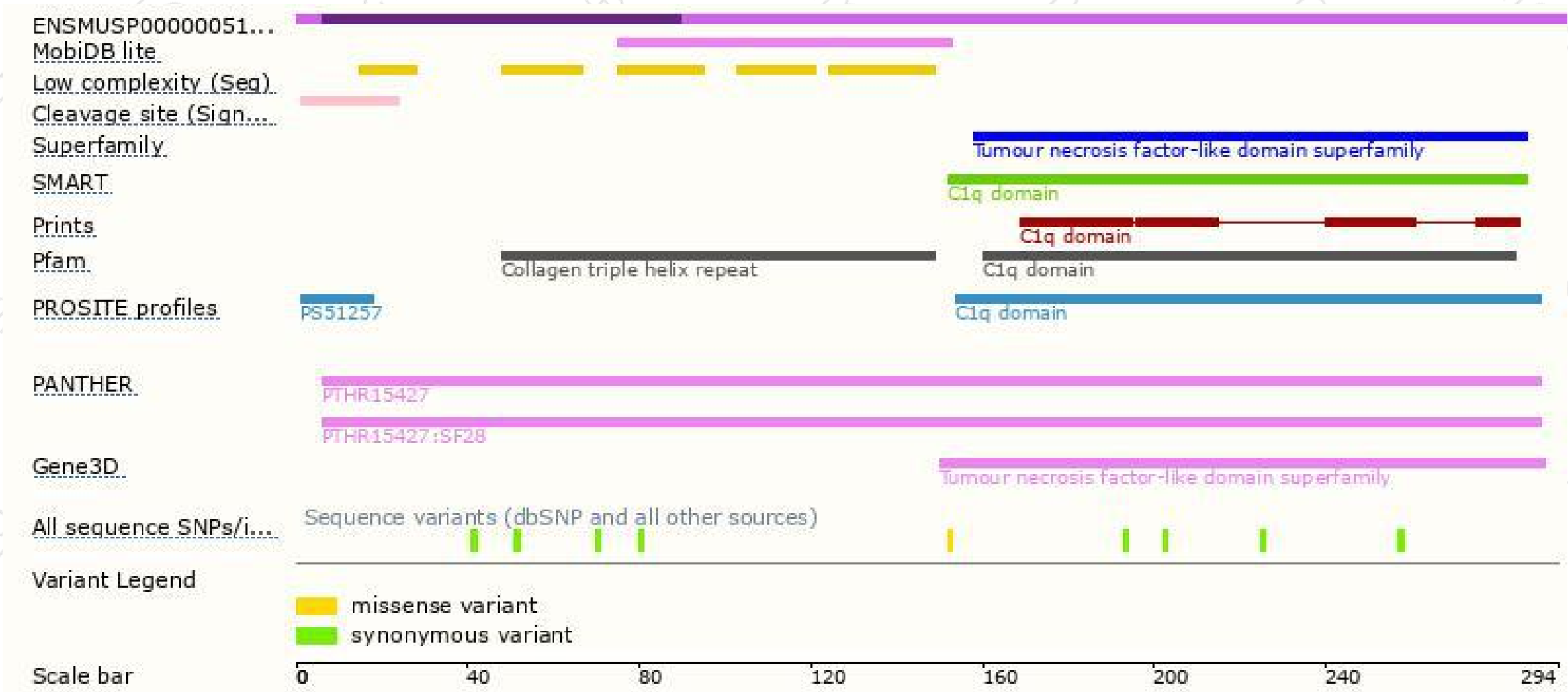
The strategy is based on the design of *C1qtnf2-201* transcript,the transcription is shown below:



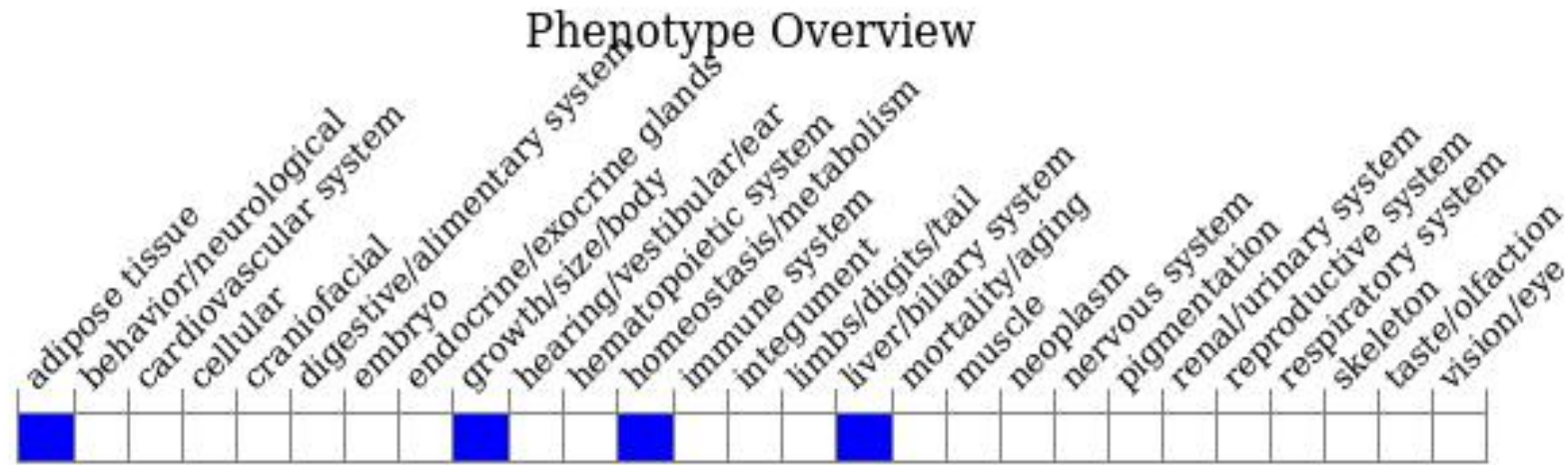
# Genomic location distribution



# 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 knock-out allele show decreased body weight, reduced adiposity, increased metabolic rate and energy expenditure, enhanced adipose tissue lipolysis, and altered hepatic and plasma lipid profiles.

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

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