

# G6pc Cas9-KO Strategy

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# Overview

## Target Gene Name

- G6pc

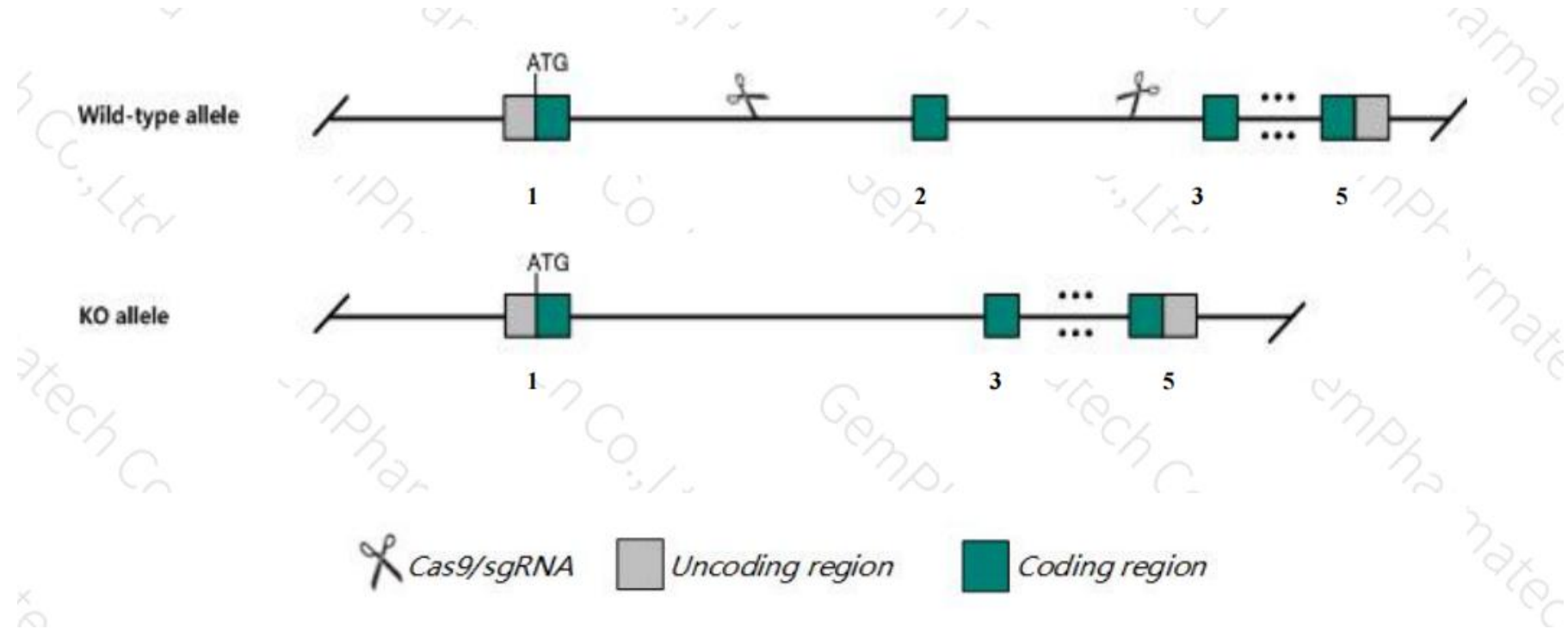
## Project Type

- Cas9-KO

## Genetic Background

- C57BL/6JGpt

# Strain Strategy



Schematic representation of CRISPR-Cas9 engineering used to edit the *G6pc* gene.

# Technical Information

- The *G6pc* gene has 1 transcript. According to the structure of *G6pc* gene, exon2 of *G6pc-201* (ENSMUST00000019469.2) transcript is recommended as the knockout region. The region contains 110bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR-Cas9 technology to modify *G6pc* gene. The brief process is as follows: gRNAs were transcribed in vitro. Cas9 and gRNAs 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 on-target amplicon sequencing. A stable F1-generation mouse strain was obtained by mating positive F0-generation mice with C57BL/6JGpt mice and confirmation of the desired mutant allele was carried out by PCR and on-target amplicon sequencing.

# Gene Information

**G6pc** glucose-6-phosphatase, catalytic [ *Mus musculus* (house mouse) ]

[Download Datasets](#)

Gene ID: 14377, updated on 4-Apr-2023

Summary

Official Symbol

G6pc provided by [MGI](#)

Official Full Name

glucose-6-phosphatase, catalytic provided by [MGI](#)

Primary source

[MGI: MGI:95607](#)

See related

[Ensembl: ENSMUSG00000078650](#) [AllianceGenome: MGI:95607](#)

Gene type

protein coding

RefSeq status

REVIEWED

Organism

[Mus musculus](#)

Lineage

Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus

Also known as

G6pt; G6pc1; G6Pase; Glc-6-Pase

Summary

The enzyme encoded by this gene is a multisubunit integral membrane protein of the endoplasmic reticulum that is composed of a catalytic subunit and transporters for glucose-6-phosphate, inorganic phosphate, and glucose. This gene is one of three glucose-6-phosphatase catalytic-subunit-encoding genes in mouse. Glucose-6-phosphatase catalyzes the hydrolysis of D-glucose 6-phosphate to D-glucose and orthophosphate and is a key enzyme in glucose homeostasis, functioning in gluconeogenesis and glycogenolysis. Mutations in this gene cause glycogen storage disease type I (GSD1). [provided by RefSeq, Sep 2015]

Expression

Biased expression in kidney adult (RPKM 142.5), liver adult (RPKM 58.4) and 1 other tissue [See more](#)

Orthologs

[human](#) [all](#)

NEW

[Try the new Gene table](#)  
[Try the new Transcript table](#)

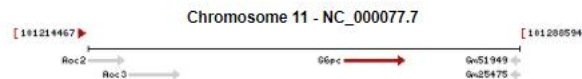
Genomic context

Location: 11; 11 D

Exon count: 5

See G6pc in [Genome Data Viewer](#)

Annotation release	Status	Assembly	Chr	Location
<a href="#">109</a>	current	GRCm39 ( <a href="#">GCF_000001635.27</a> )	11	NC_000077.7 (101258542..101268729)
108.20200622	previous assembly	GRCm38.p6 ( <a href="#">GCF_000001635.26</a> )	11	NC_000077.6 (101367716..101377903)



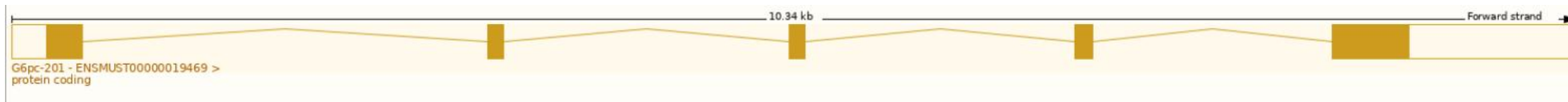
Source: <https://www.ncbi.nlm.nih.gov/>

# Transcript Information

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

Transcript ID	Name	bp	Protein	Biotype	CCDS	UniProt Match	Flags
<a href="#">ENSMUST00000019469.3</a>	G6pc-201	2414	<a href="#">357aa</a>	Protein coding	<a href="#">CCDS25466</a>	<a href="#">P35576</a>	Ensembl Canonical Gencode basic APPRIS P1 TSL:1

The strategy is based on the design of *G6pc-201* transcript, the transcription is shown below:



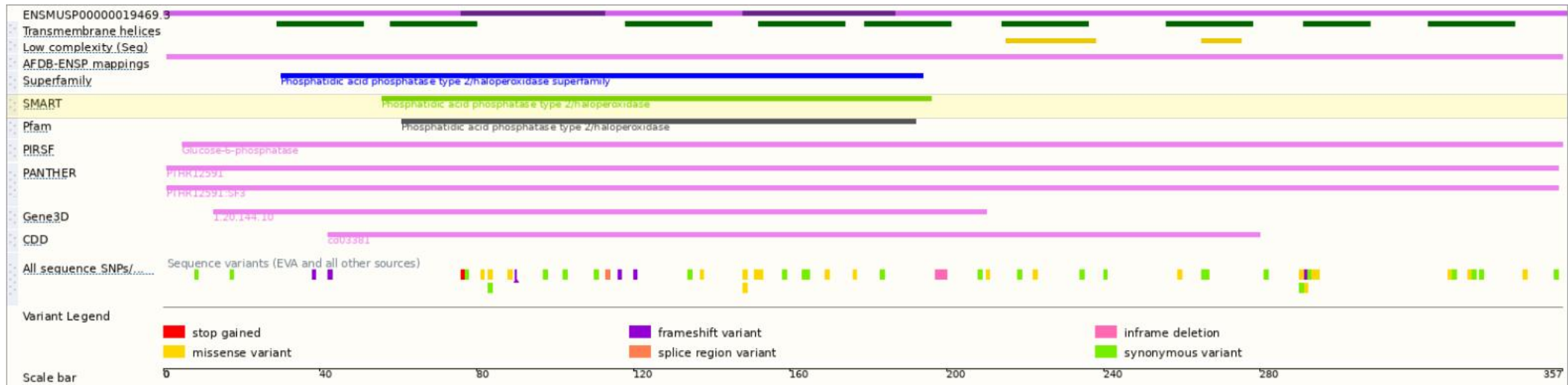
Source: <https://www.ensembl.org>

# Genomic Information



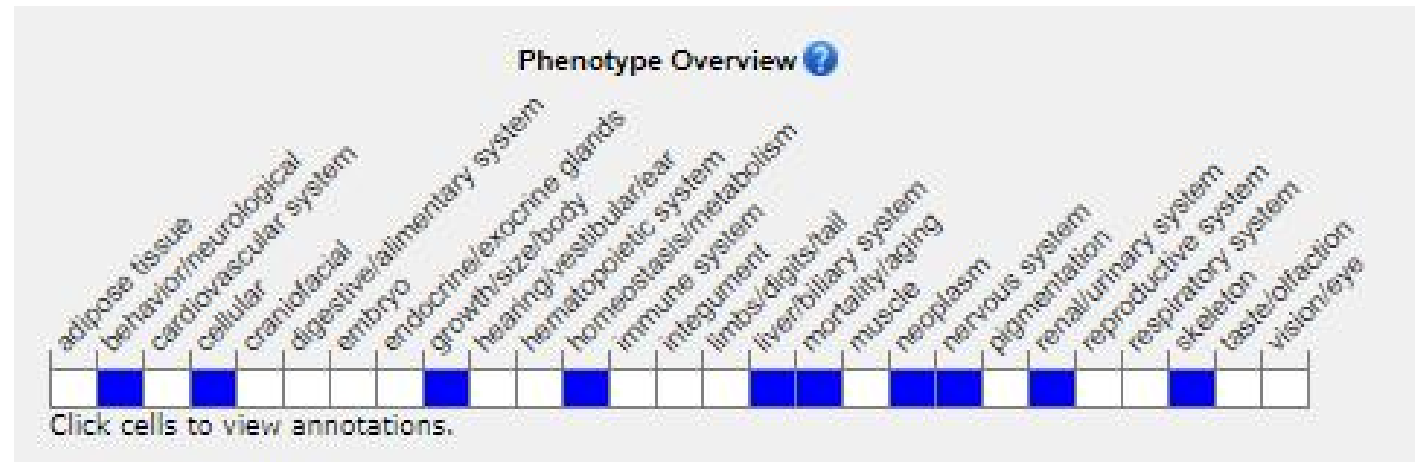


# Protein Information





# Mouse Phenotype Information (MGI)



- Mice homozygous for disruptions in this gene tend to die within a couple of weeks of weaning. Blood chemistry and glucose metabolism are abnormal as is glycogen storage.

# Important Information

- According to the breeding data, the gene knockout homozygous mice died at the embryonic stage.
- *G6pc* is located on Chr11. If the knockout mice are crossed with other mouse strains to obtain double homozygous mutant offspring, please avoid the situation that the second gene is on the same chromosome.
- This Strategy is designed based on genetic information in existing databases. Due to the complexity of biological processes, all risks of the mutation on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.