

# *G6pc* Cas9-CKO Strategy

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# Project Overview

**Project Name**

***G6pc***

**Project type**

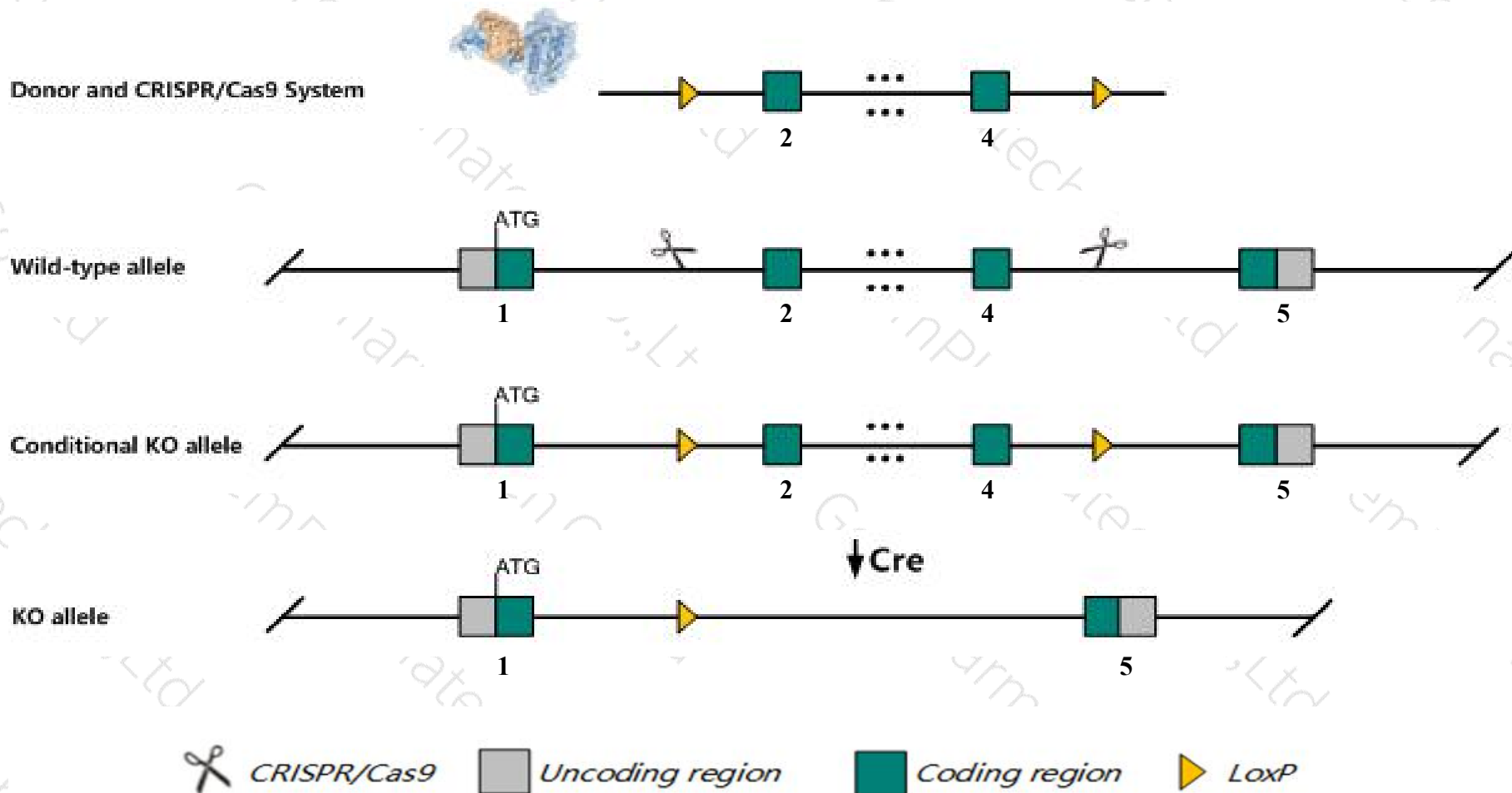
**Cas9-CKO**

**Strain background**

**C57BL/6JGpt**

# Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *G6pc* gene. The schematic diagram is as follows:



# Technical routes

- The *G6pc* gene has 1 transcript. According to the structure of *G6pc* gene, exon2-exon4 of *G6pc-201* (ENSMUST00000019469.2) transcript is recommended as the knockout region. The region contains 332bp 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: 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.

- According to the existing MGI data, 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.
- The *G6pc* 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at existing technological level.



# Gene information (NCBI)

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

Gene ID: 14377, updated on 5-Feb-2019

### Summary



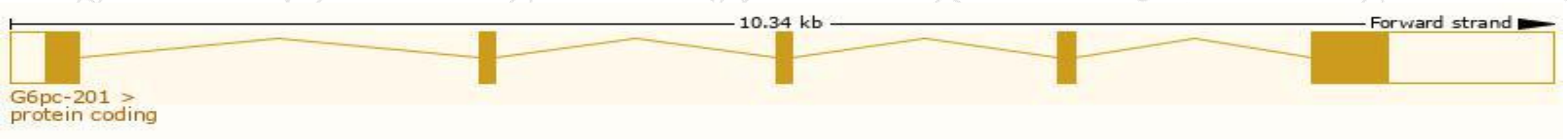
<b>Official Symbol</b>	G6pc provided by <a href="#">MGI</a>
<b>Official Full Name</b>	glucose-6-phosphatase, catalytic provided by <a href="#">MGI</a>
<b>Primary source</b>	<a href="#">MGI:MGI:95607</a>
<b>See related</b>	<a href="#">Ensembl:ENSMUSG00000078650</a>
<b>Gene type</b>	protein coding
<b>RefSeq status</b>	REVIEWED
<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>	AW107337, G6Pase, G6pt, Glc-6-Pase
<b>Summary</b>	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]
<b>Expression</b>	Biased expression in kidney adult (RPKM 142.5), liver adult (RPKM 58.4) and 1 other tissue <a href="#">See more</a>
<b>Orthologs</b>	<a href="#">human</a> <a href="#">all</a>

# Transcript information (Ensembl)

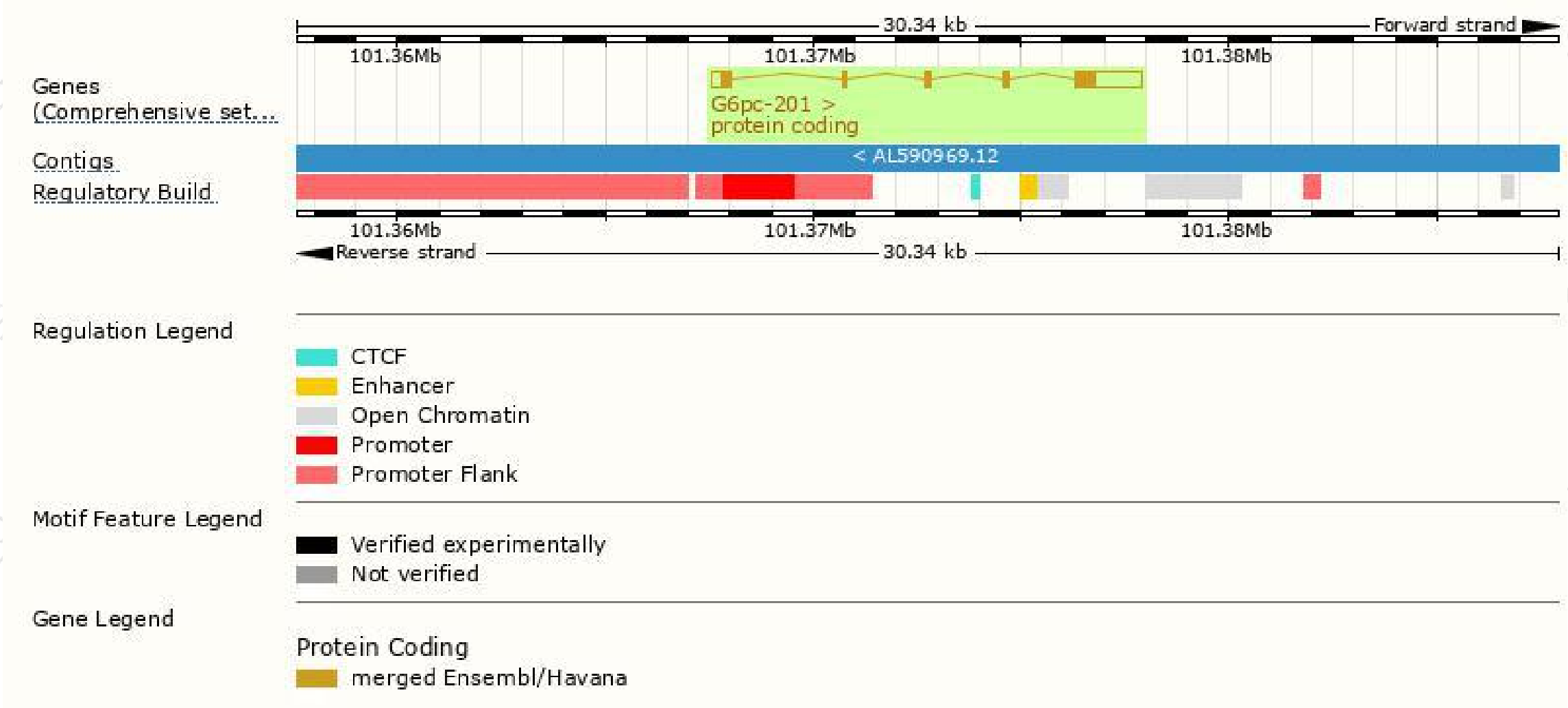
The gene has 1 transcript, and the transcript is shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
G6pc-201	<a href="#">ENSMUST00000019469.2</a>	2414	<a href="#">357aa</a>	Protein coding	<a href="#">CCDS25466</a>	<a href="#">P35576</a>	TSL:1 GENCODE basic APPRIS P1

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

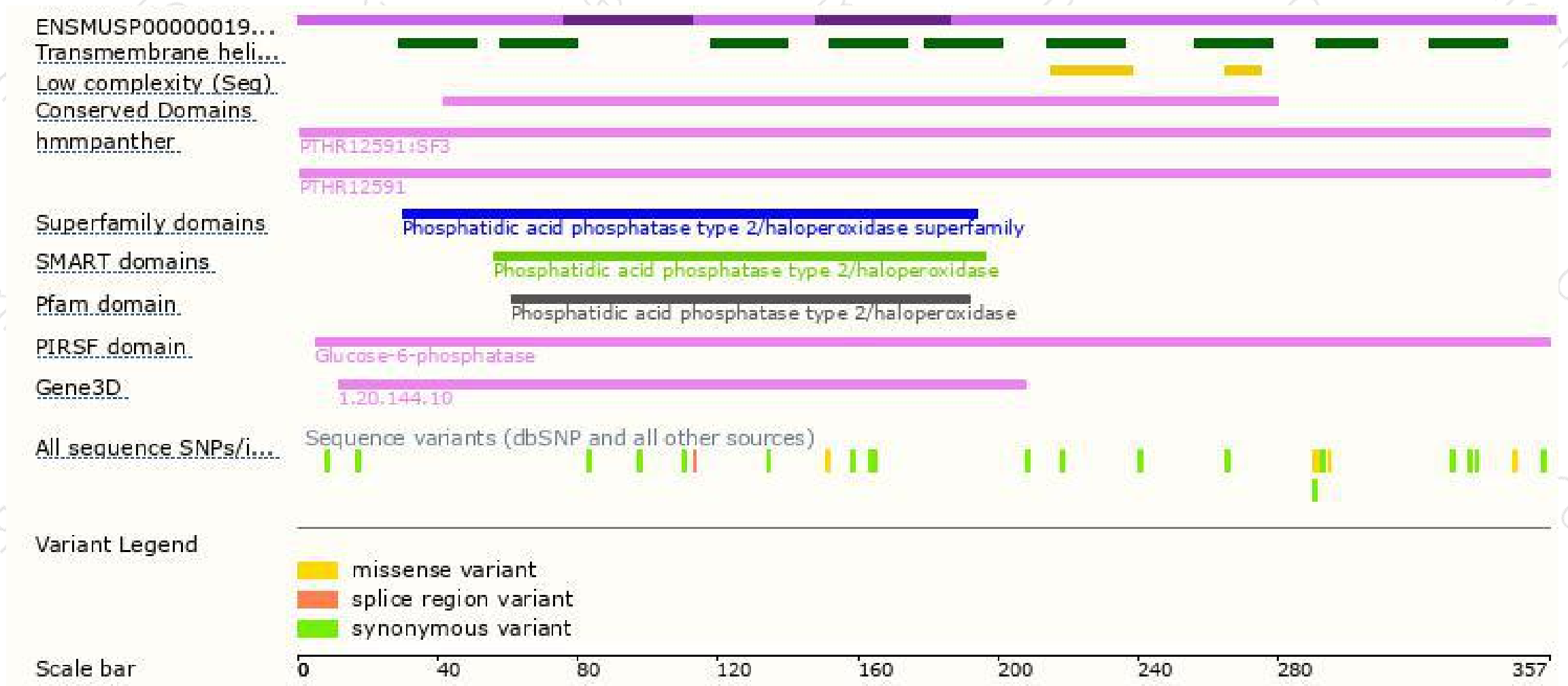


# Genomic location distribution

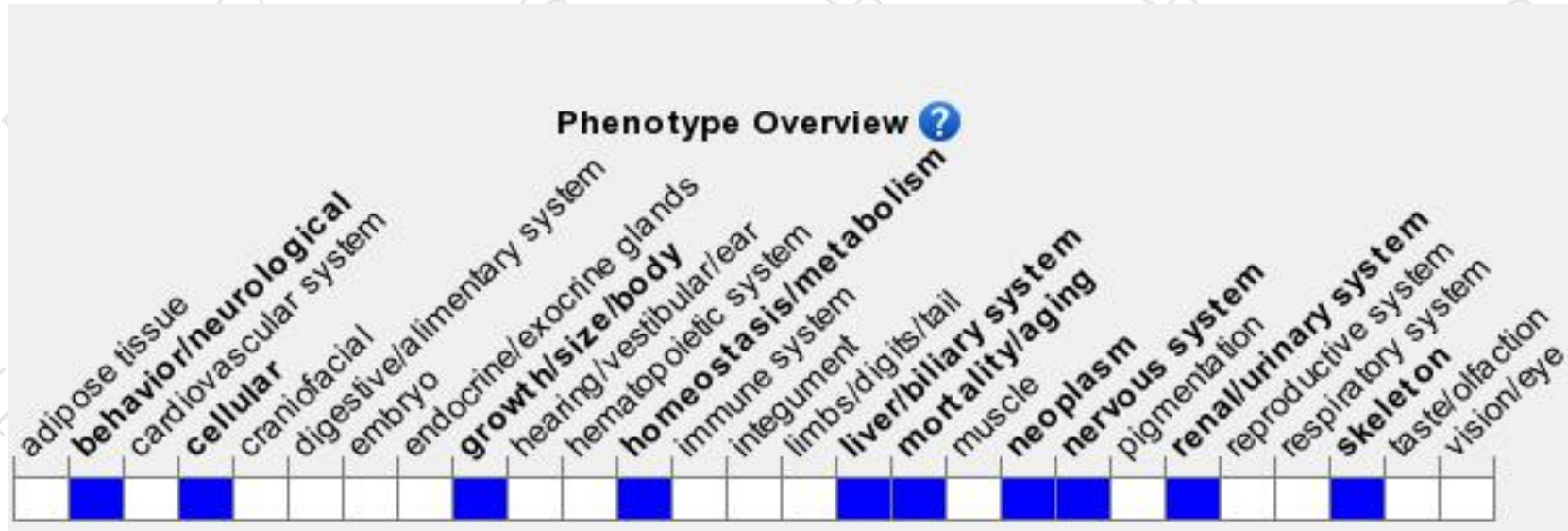




# Protein domain



# 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 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.

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

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