

# *Phpt1* Cas9-CKO Strategy

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# Overview

## Target Gene Name

- *Phpt1*

## Project Type

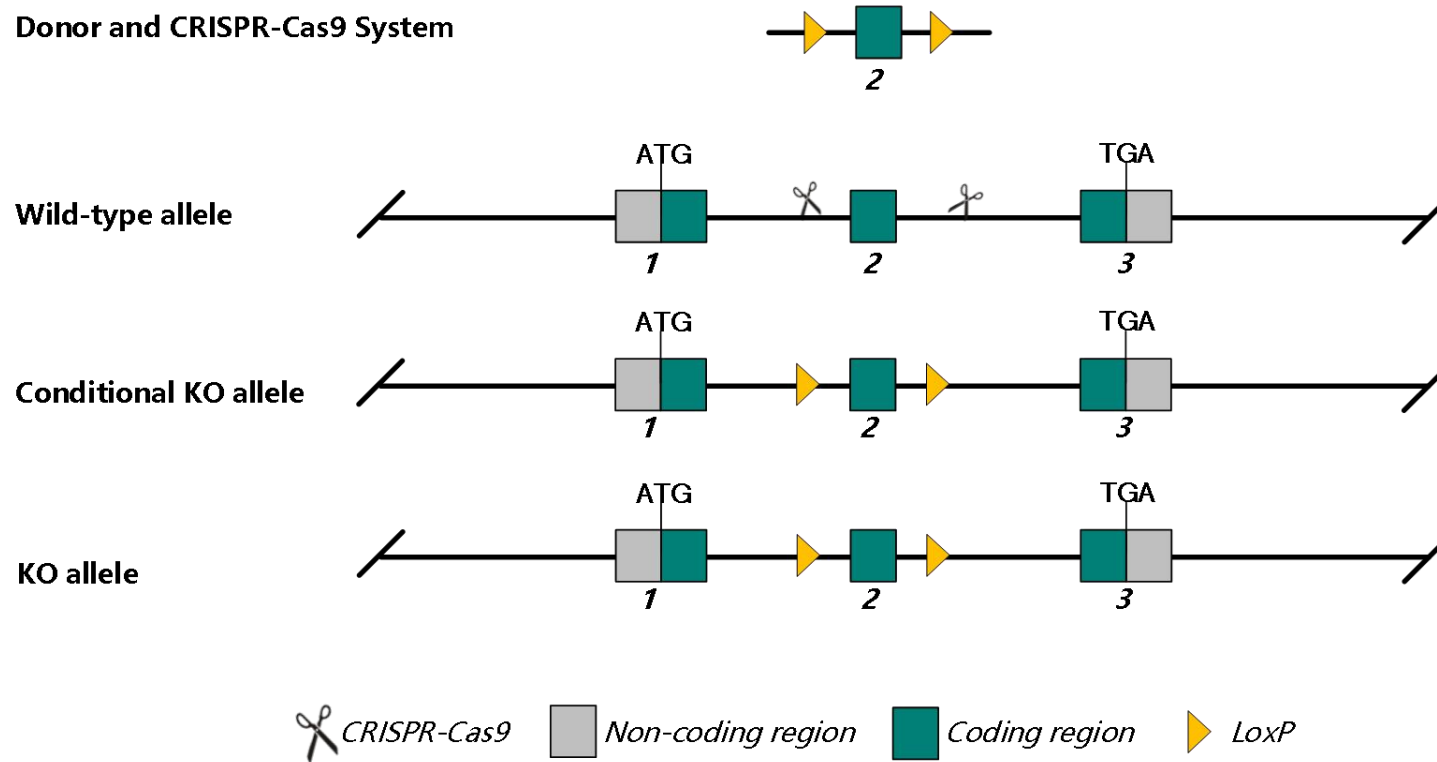
- Cas9-CKO

## Genetic Background

- C57BL/6JGpt

# Strain Strategy

Donor and CRISPR-Cas9 System



Schematic representation of CRISPR-Cas9 engineering used to edit the *Phpt1* gene.

# Technical Information

- The *Phpt1* gene has 2 transcripts. According to the structure of *Phpt1* gene, exon 2 of *Phpt1*-201 (ENSMUST00000039156.7) is recommended as the knockout region. The region contains 125 bp of coding sequence. Knocking out the region will result in disruption of gene function.
- In this project we use CRISPR-Cas9 technology to modify *Phpt1* 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 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.
- 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.

# Gene Information

**Phpt1** phosphohistidine phosphatase 1 [ *Mus musculus* (house mouse) ]

Gene ID: 75454, updated on 7-Sep-2023

[Download Datasets](#)

## Summary

<b>Official Symbol</b>	Phpt1 provided by <a href="#">MGI</a>
<b>Official Full Name</b>	phosphohistidine phosphatase 1 provided by <a href="#">MGI</a>
<b>Primary source</b>	<a href="#">MGI:MGI:1922704</a>
<b>See related</b>	<a href="#">Ensembl:ENSMUSG00000036504</a> <a href="#">AllianceGenome:MGI:1922704</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>	PHP; Php14; 1700008C22Rik
<b>Summary</b>	Predicted to enable calcium channel inhibitor activity; protein histidine phosphatase activity; and transmembrane transporter binding activity. Involved in positive regulation of cell motility. Located in cytosol. Is expressed in several structures, including alimentary system; genitourinary system; integumental system; nervous system; and respiratory system. Orthologous to human PHPT1 (phosphohistidine phosphatase 1). [provided by Alliance of Genome Resources, Apr 2022]
<b>Expression</b>	Ubiquitous expression in CNS E11.5 (RPKM 79.5), CNS E14 (RPKM 73.7) and 28 other tissues <a href="#">See more</a>
<b>Orthologs</b>	<a href="#">human</a> <a href="#">all</a>
<b>NEW</b>	<a href="#">Try the new Gene table</a> <a href="#">Try the new Transcript table</a>

## Genomic context

**Location:** 2 A3; 2 17.44 cM

**Exon count:** 6

See Phpt1 in [Genome Data Viewer](#)

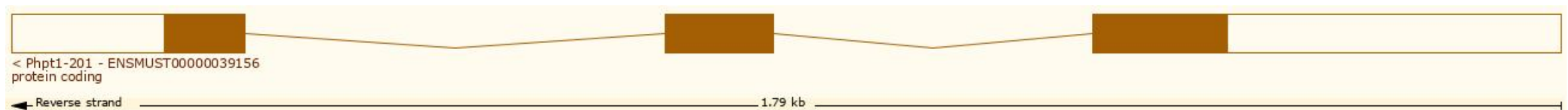
<https://www.ncbi.nlm.nih.gov/gene/75454>

# Transcript Information

The gene has 2 transcripts, all transcripts are shown below:

Transcript ID ▲	Name ▼	bp ▼	Protein ▼	Biotype ▼	CCDS ▼	UniProt Match ▼	Flags ▼
<a href="#">ENSMUST00000039156.7</a>	Phpt1-201	937	<a href="#">124aa</a>	Protein coding	<a href="#">CCDS15781</a>	<a href="#">Q9DAK9</a>	Ensembl Canonical Gencode basic APPRIS P1 TSL:1
<a href="#">ENSMUST00000147096.2</a>	Phpt1-202	656	No protein	Protein coding CDS not defined		-	TSL:3

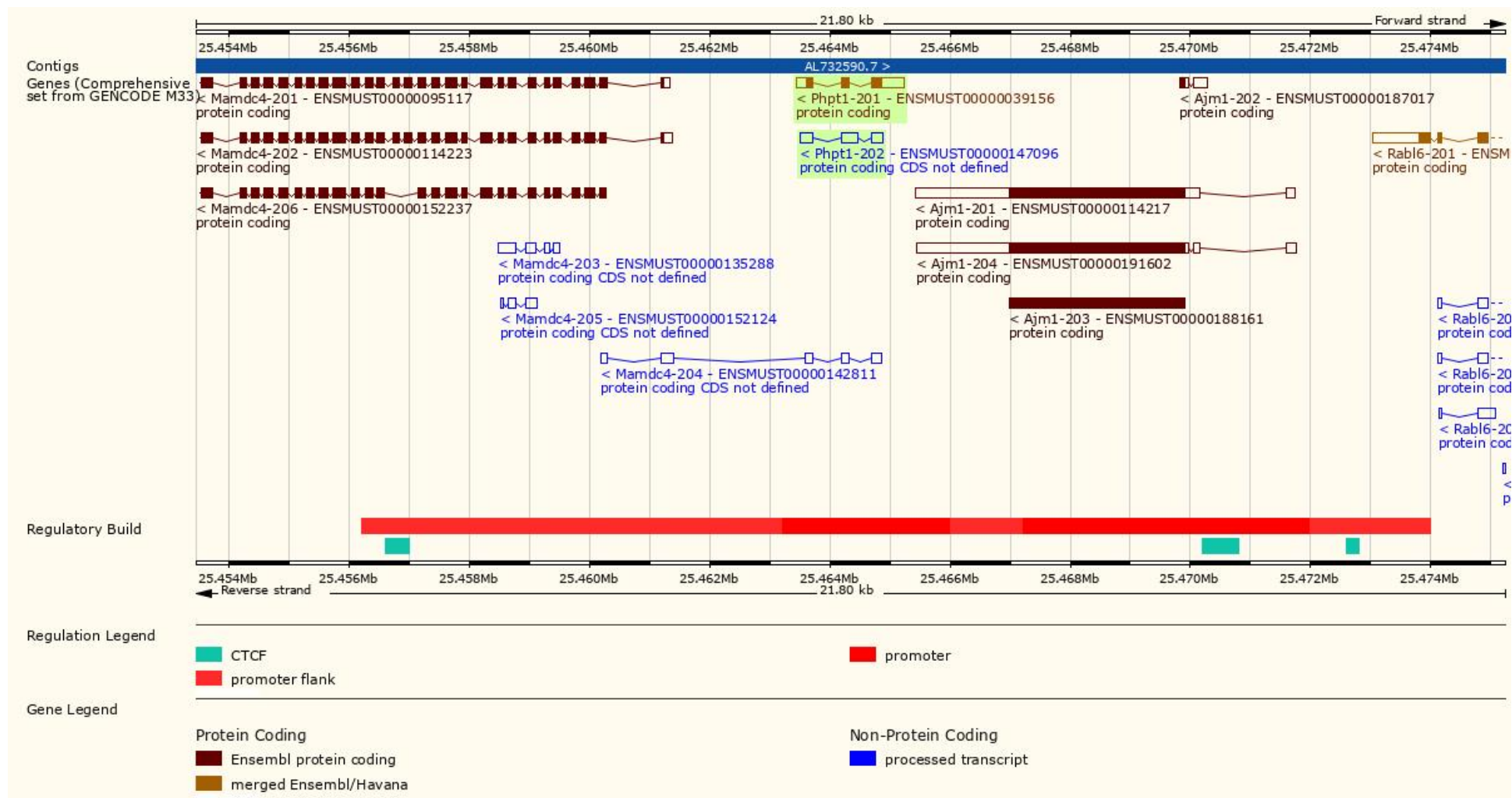
The strategy is based on the design of *Phpt1*-201 transcript, the transcription is shown below:



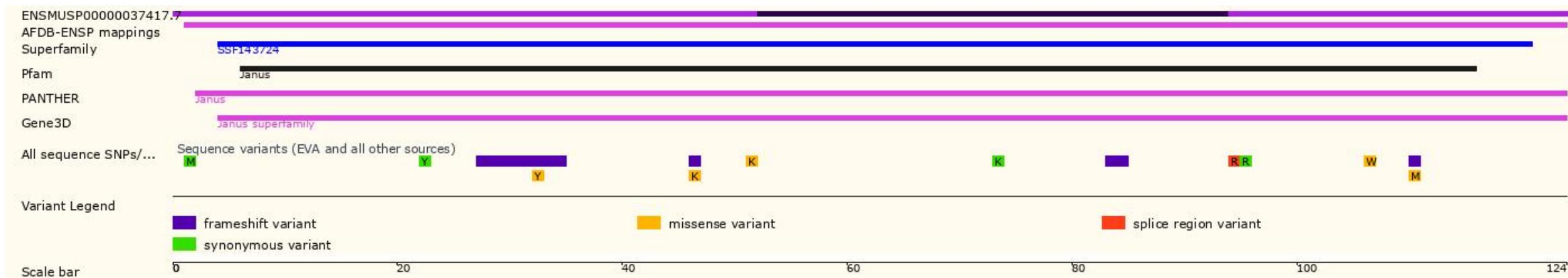
Source: <http://asia.ensembl.org/>



# Genomic Information

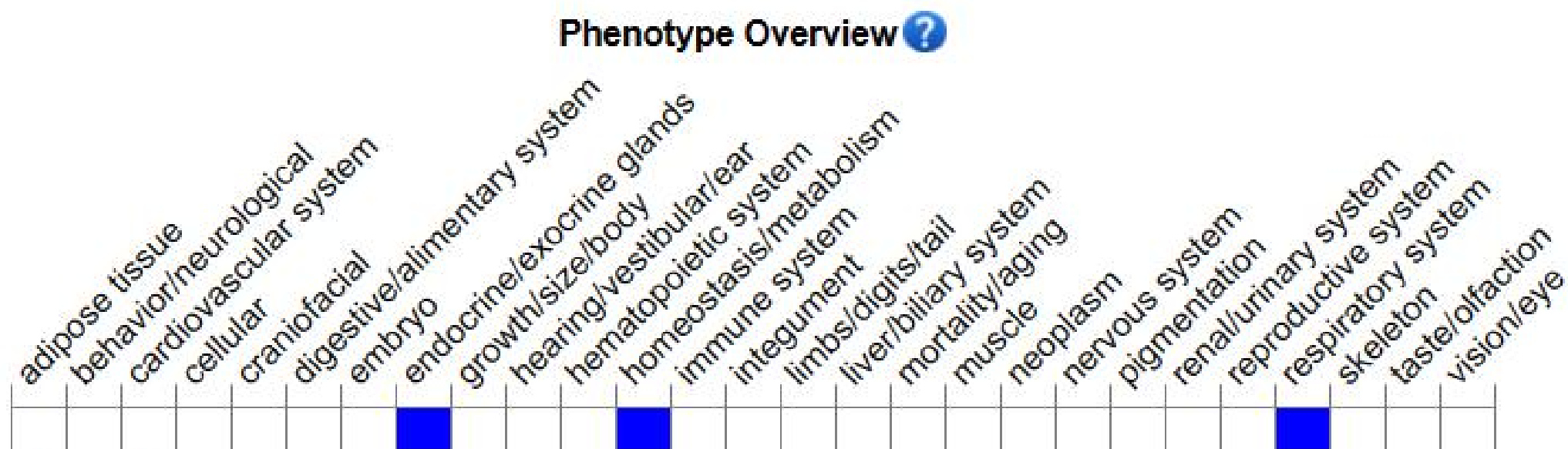


# Protein Information





# Mouse Phenotype Information (MGI)



Homozygous knockout leads to neonatal hyperinsulinemic hypoglycemia and to impaired glucose tolerance in adult mice.

# Important Information

- The intron 1-2 of *Phpt1*-201 is 370 bp, the loxp insertion may affect the regulation of this gene.
- The intron 2-3 of *Phpt1*-201 is 488 bp, the loxp insertion may affect the regulation of this gene.
- The knockout region is about 0.7 kb away from the 3' of the *Ajml* gene, which may affect the regulation of this gene.
- The knockout region overlap with *Mamdc4* gene, which may affect the regulation of this gene.
- *Phpt1* is located on Chr 2. 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 risk of loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.