

Gpd2 Cas9-CKO Strategy

Designer:

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Project Overview

Project Name

Gpd2

Project type

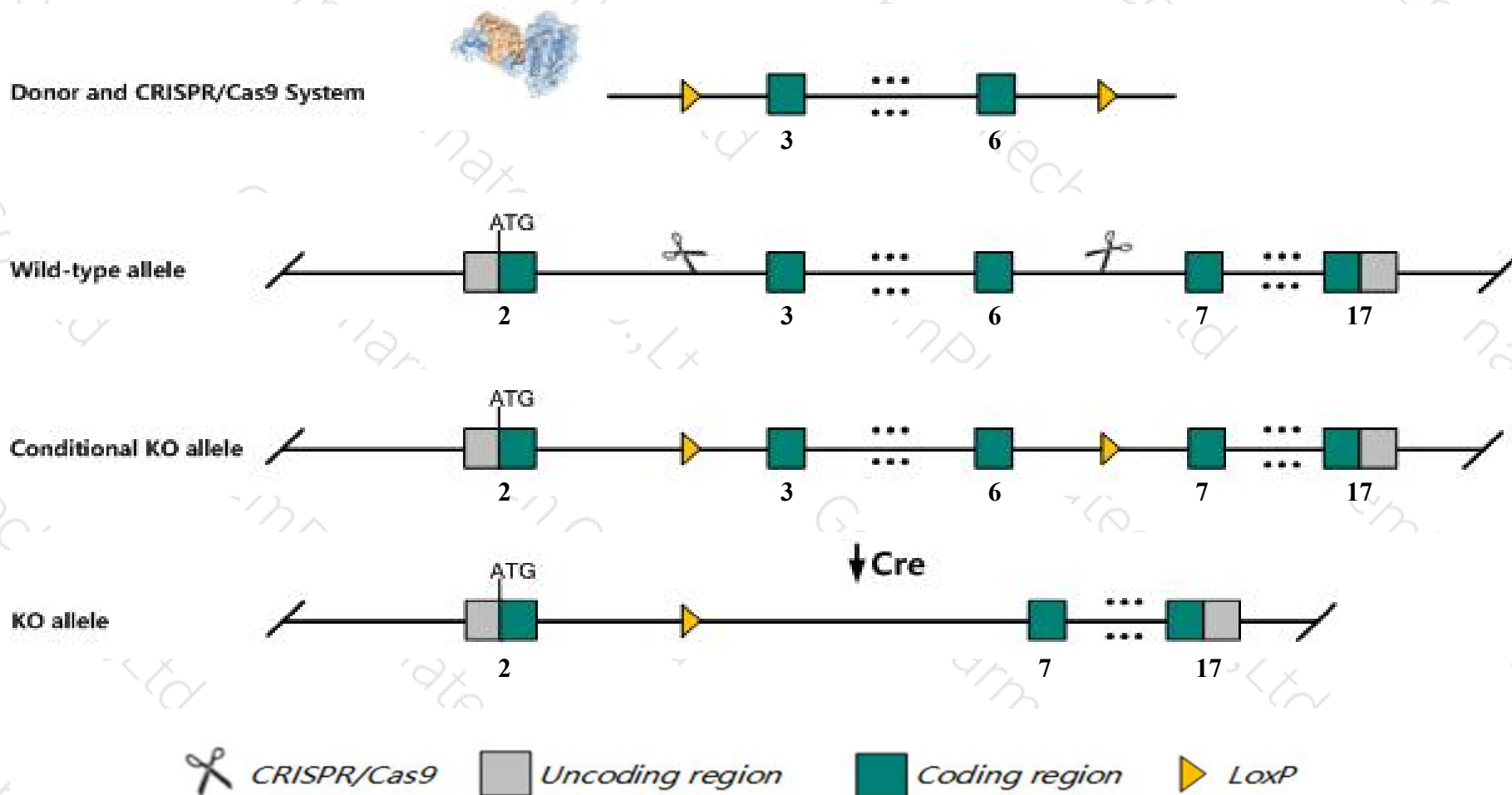
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Gpd2* gene. The schematic diagram is as follows:



Technical routes

- The *Gpd2* gene has 7 transcripts. According to the structure of *Gpd2* gene, exon3-exon6 of *Gpd2*-207 (ENSMUST00000169687.7) transcript is recommended as the knockout region. The region contains 559bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Gpd2* 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, Homozygotes for targeted null mutations exhibit diminished hepatic ATP levels, decreased adiposity and fasting blood glucose, and, on an inbred background, reductions in preweaning viability and fertility.
- The *Gpd2* gene is located on the Chr2. 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)

Gpd2 glycerol phosphate dehydrogenase 2, mitochondrial [Mus musculus (house mouse)]

Gene ID: 14571, updated on 31-Jan-2019

Summary



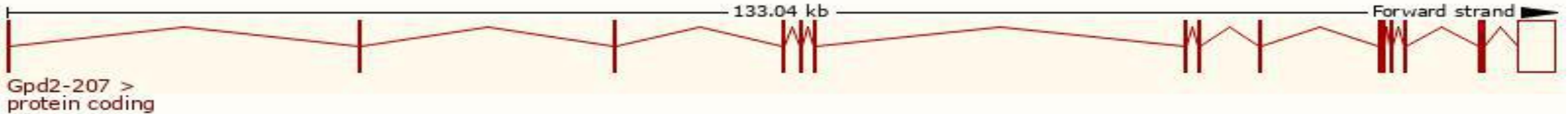
Official Symbol	Gpd2 provided by MGI
Official Full Name	glycerol phosphate dehydrogenase 2, mitochondrial provided by MGI
Primary source	MGI:MGI:99778
See related	Ensembl:ENSMUSG00000026827
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	AA408484, AI448216, AU021455, AW494132, GPDH, Gdm1, Gpd-m, Gpdh-m, TISP38
Expression	Broad expression in testis adult (RPKM 48.2), mammary gland adult (RPKM 14.9) and 21 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

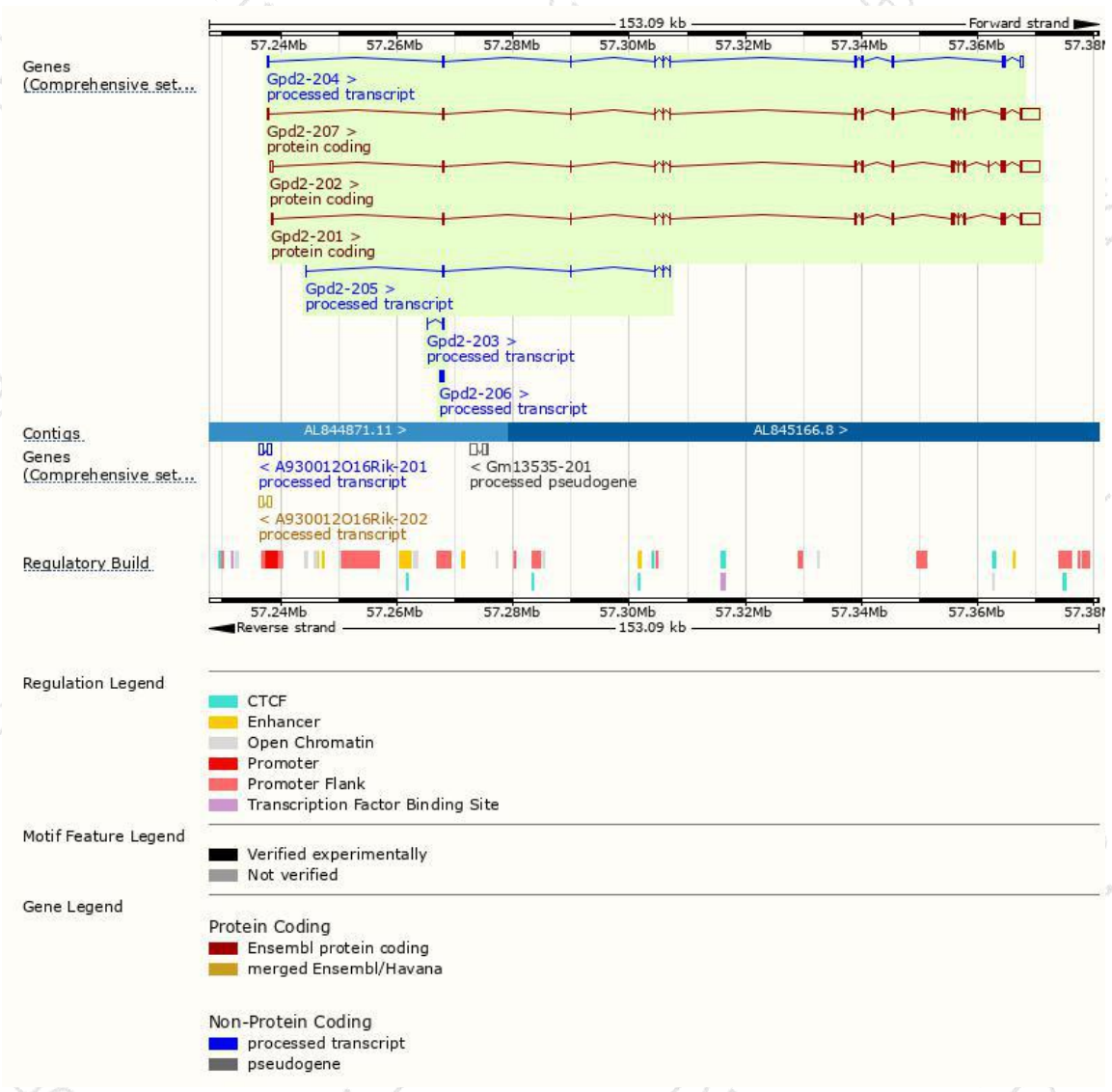
The gene has 7 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Gpd2-207	ENSMUST00000169687.7	5745	727aa	Protein coding	CCDS16045	Q64521	TSL:1 GENCODE basic APPRIS P1
Gpd2-201	ENSMUST00000028167.2	5620	727aa	Protein coding	CCDS16045	Q64521	TSL:1 GENCODE basic APPRIS P1
Gpd2-202	ENSMUST00000112618.8	5759	745aa	Protein coding	-	A2AQR0	TSL:5 GENCODE basic
Gpd2-204	ENSMUST00000141536.7	2176	No protein	Processed transcript	-	-	TSL:5
Gpd2-205	ENSMUST00000148991.1	620	No protein	Processed transcript	-	-	TSL:1
Gpd2-206	ENSMUST00000154612.1	392	No protein	Processed transcript	-	-	TSL:5
Gpd2-203	ENSMUST00000124689.7	220	No protein	Processed transcript	-	-	TSL:5

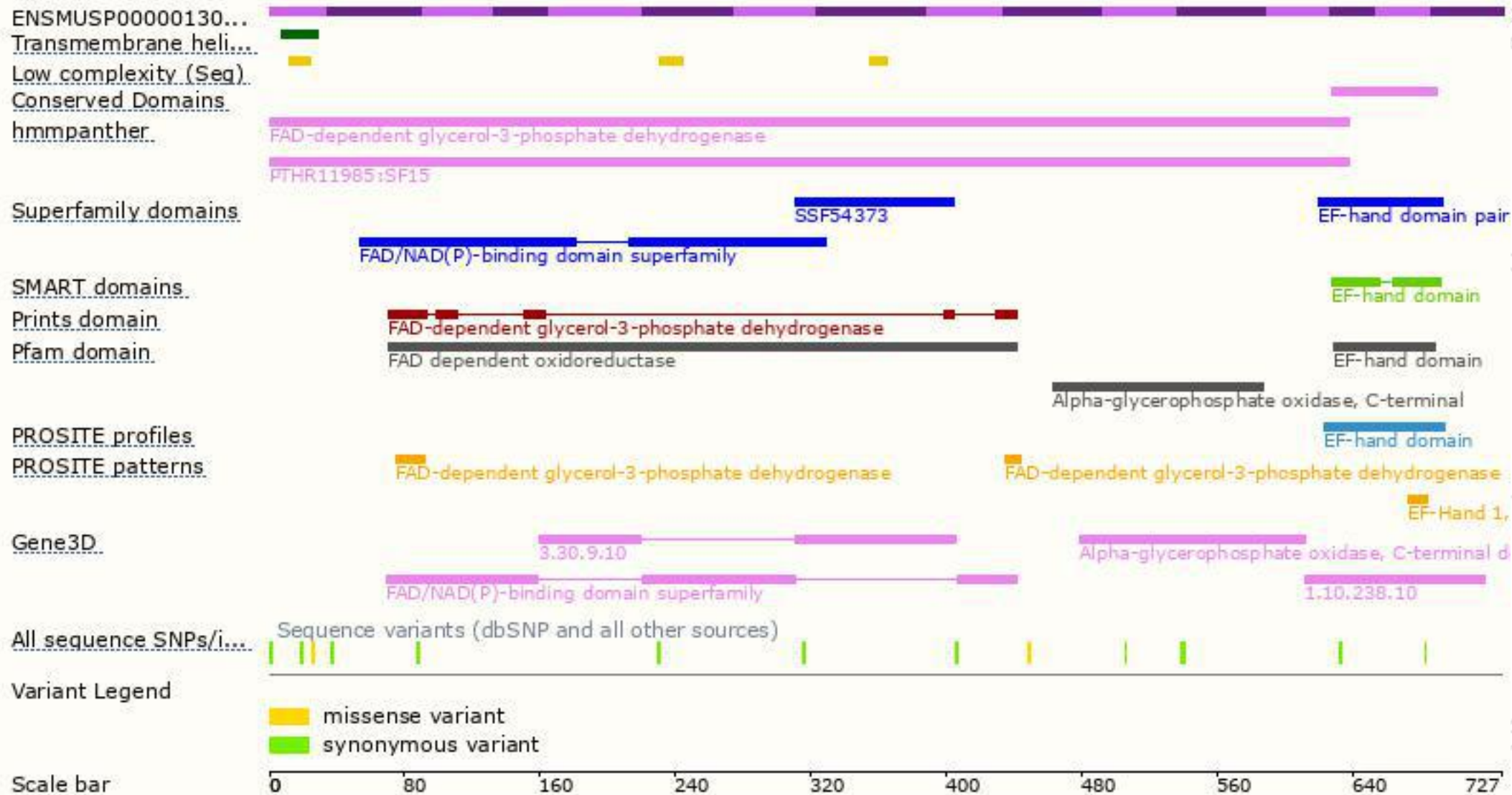
The strategy is based on the design of *Gpd2-207* transcript,The transcription is shown below



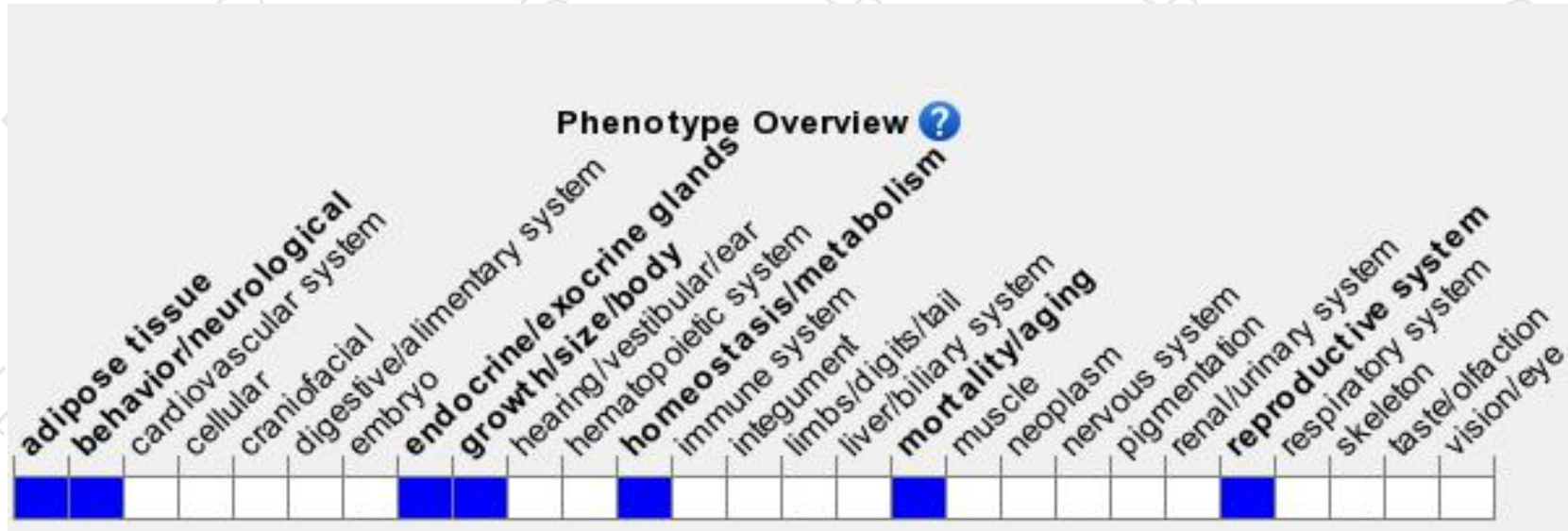
Genomic location distribution



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, Homozygotes for targeted null mutations exhibit diminished hepatic ATP levels, decreased adiposity and fasting blood glucose, and, on an inbred background, reductions in preweaning viability and fertility.

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

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