

Ptpn1 Cas9-CKO Strategy

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Project Overview

Project Name

Ptpn1

Project type

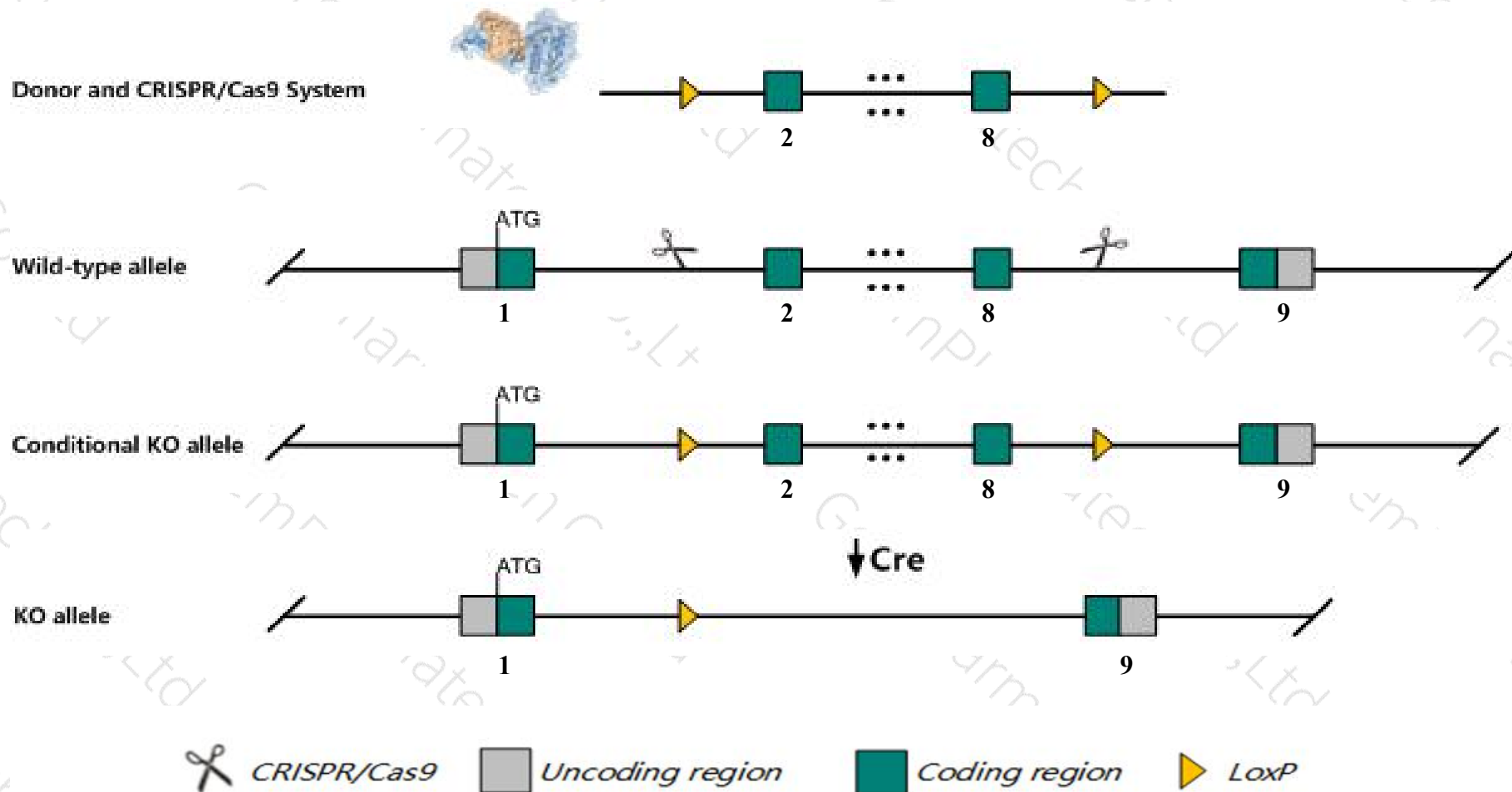
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Ptpn1* gene. The schematic diagram is as follows:



Technical routes

- The *Ptpn1* gene has 7 transcripts. According to the structure of *Ptpn1* gene, exon2-exon8 of *Ptpn1-201* (ENSMUST00000029053.7) transcript is recommended as the knockout region. The region contains 1022bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Ptpn1* 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 greatly reduced adiposity due to reduced fat cell mass, increased basal metabolic rate, mild hypoglycemia and hypoinsulinemia, increased insulin sensitivity, and enhanced sensitivity to leptin.
- The *Ptpn1* 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)

Ptpn1 protein tyrosine phosphatase, non-receptor type 1 [Mus musculus (house mouse)]

Gene ID: 19246, updated on 10-Feb-2019

Summary



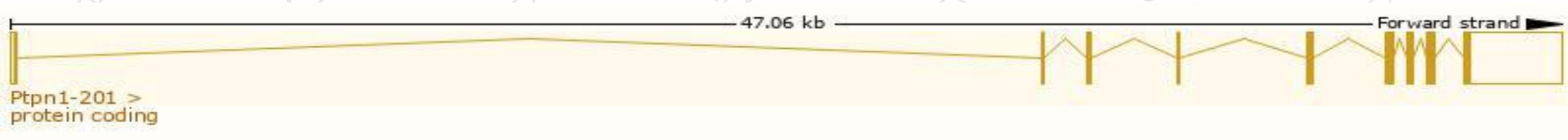
Official Symbol	Ptpn1 provided by MGI
Official Full Name	protein tyrosine phosphatase, non-receptor type 1 provided by MGI
Primary source	MGI:MGI:97805
See related	Ensembl:ENSMUSG000000027540
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	PTP-1B, PTP-HA2, PTP1B
Expression	Ubiquitous expression in spleen adult (RPKM 41.9), ovary adult (RPKM 30.8) and 28 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

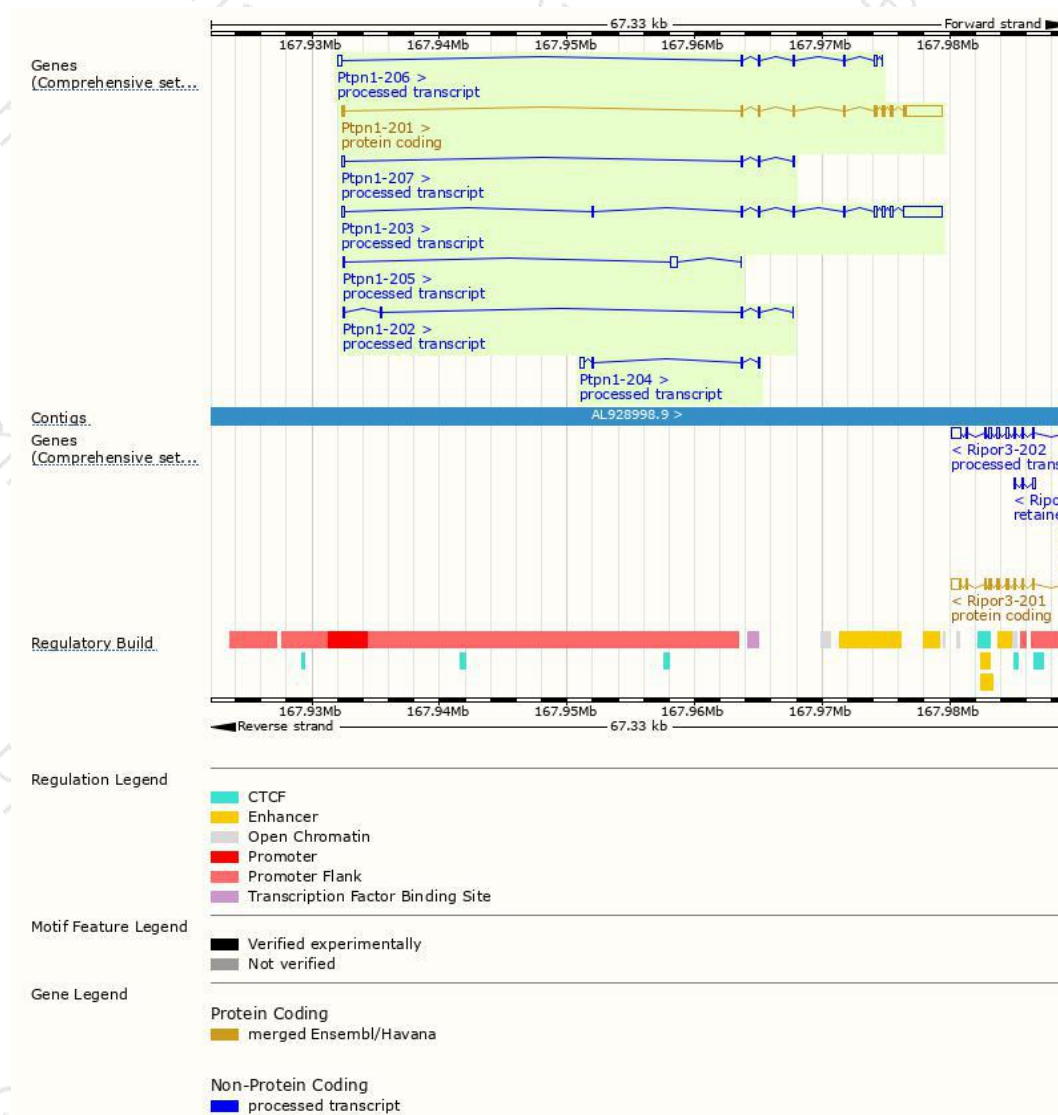
The gene has 7 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Ptpn1-201	ENSMUST00000029053.7	4213	432aa	Protein coding	CCDS17107	P35821 Q3TZW9	TSL:1 GENCODE basic APPRIS P1
Ptpn1-203	ENSMUST00000126839.7	4292	No protein	Processed transcript	-	-	TSL:1
Ptpn1-206	ENSMUST00000147210.7	921	No protein	Processed transcript	-	-	TSL:5
Ptpn1-205	ENSMUST00000144249.1	682	No protein	Processed transcript	-	-	TSL:3
Ptpn1-204	ENSMUST00000142717.1	549	No protein	Processed transcript	-	-	TSL:3
Ptpn1-202	ENSMUST00000124039.7	517	No protein	Processed transcript	-	-	TSL:5
Ptpn1-207	ENSMUST00000151705.7	466	No protein	Processed transcript	-	-	TSL:3

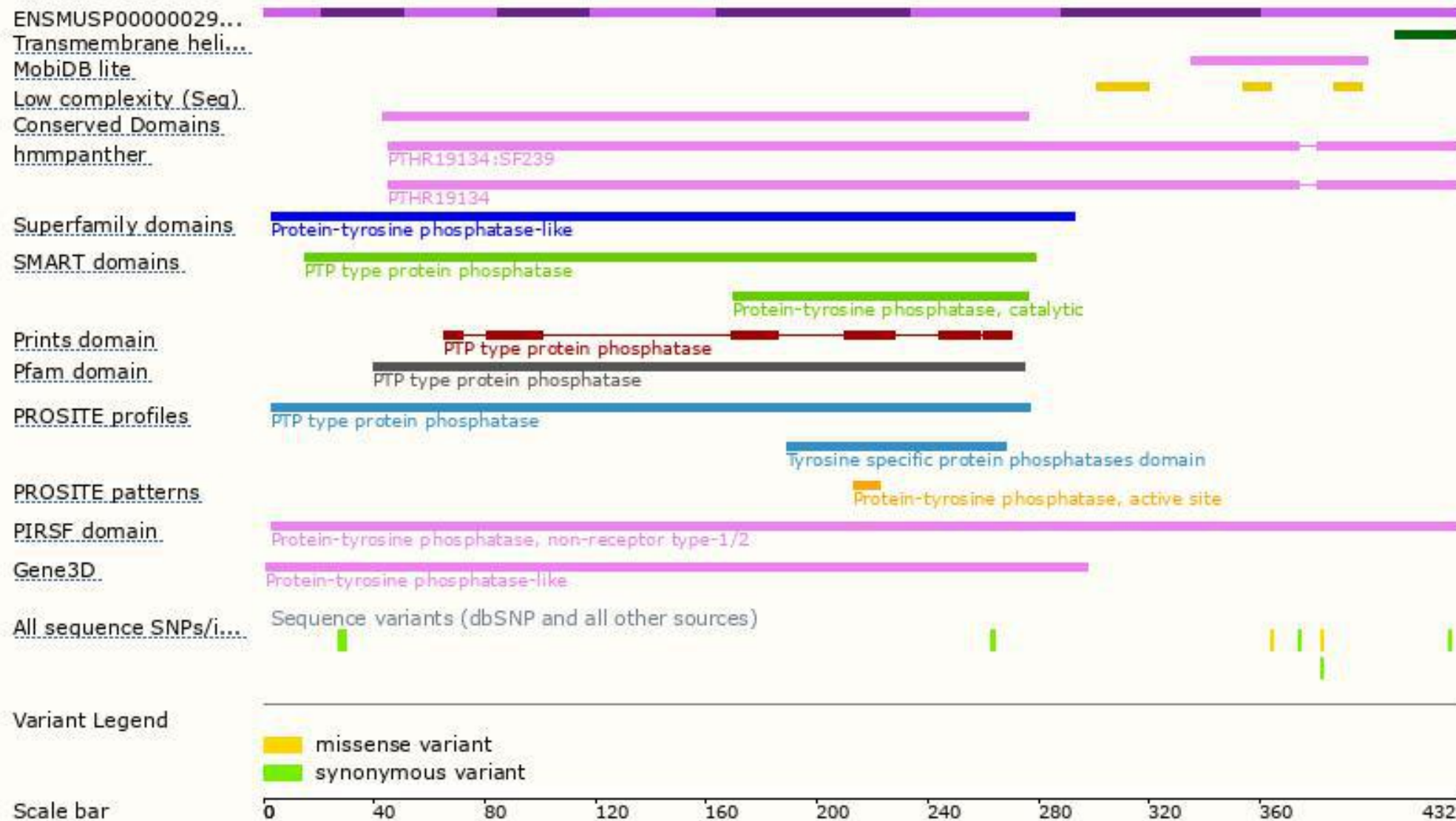
The strategy is based on the design of *Ptpn1-201* transcript,The transcription is shown below



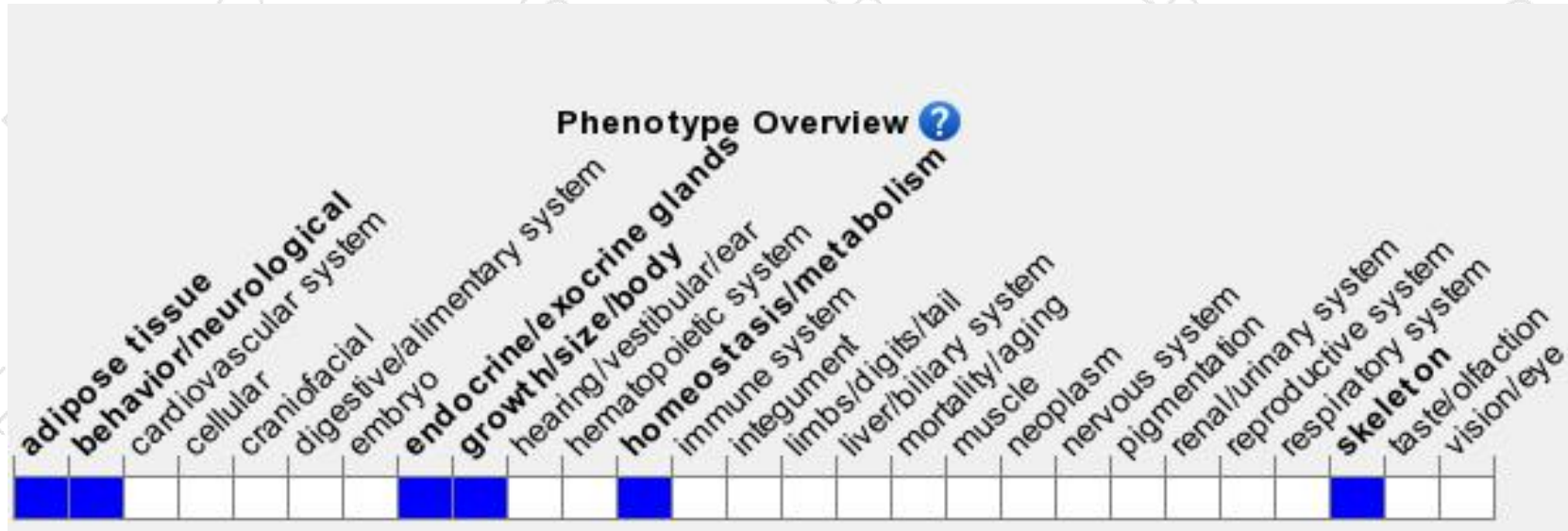
Genomic location distribution



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, Homozygotes for targeted null mutations exhibit greatly reduced adiposity due to reduced fat cell mass, increased basal metabolic rate, mild hypoglycemia and hypoinsulinemia, increased insulin sensitivity, and enhanced sensitivity to leptin.

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

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