Ptpn11 Cas9-KO Strategy

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Design Date: 2019-9-11
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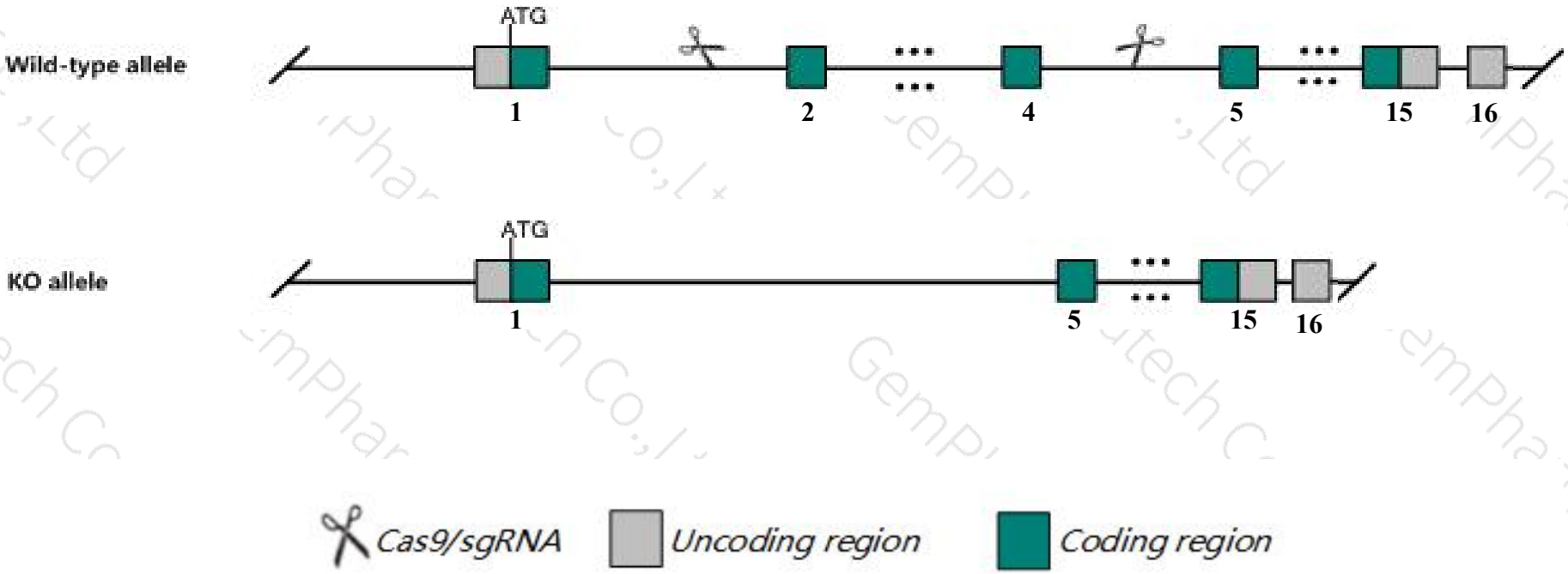
Project Overview

Project Name	***Ptpn11***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Ptpn11* gene. The schematic diagram is as follows:



Technical routes

➢ The *Ptpn11* gene has 4 transcripts. According to the structure of *Ptpn11* gene, exon2-exon4 of *Ptpn11-201* (ENSMUST00000054547.8) transcript is recommended as the knockout region.The region contains 511bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Ptpn11* gene. The brief process is as follows: gRNA was transcribed in vitro.Cas9 and gRNA 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.

Notice

➢ According to the existing MGI data,Homozygous null mutants exhibit abnormal mesoderm patterning leading to a failure of gastrulation and death by embryonic day 10.5. In heterozygous state the null mutant acts as a dominant enhancer of a mild epidermal growth factor receptor mutation.

➢ The *Ptpn11* gene is located on the Chr5. 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 the gene knockout on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

Gene information（NCBI）

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Ptpn11 protein tyrosine phosphatase, non-receptor type 11 [Mus musculus (house mouse)]

Gene ID: 19247, updated on 7-Apr-2019

Summary

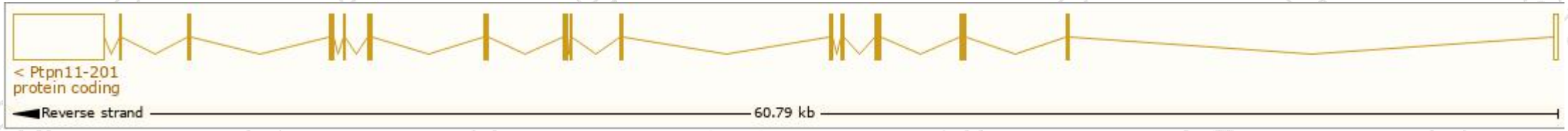
Official Symbol	Ptpn11 provided by MGI
Official Full Name	protein tyrosine phosphatase, non-receptor type 11 provided by MGI
Primary source	MGI:MGI:99511
See related	Ensembl:ENSMUSG00000043733
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	2700084A17Rik, AW536184, PTP1D, PTP2C, SAP-2, SH-PTP2, SH-PTP3, SHP-2, Shp2, Syp
Expression	Ubiquitous expression in heart adult (RPKM 24.0), genital fat pad adult (RPKM 23.7) and 28 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

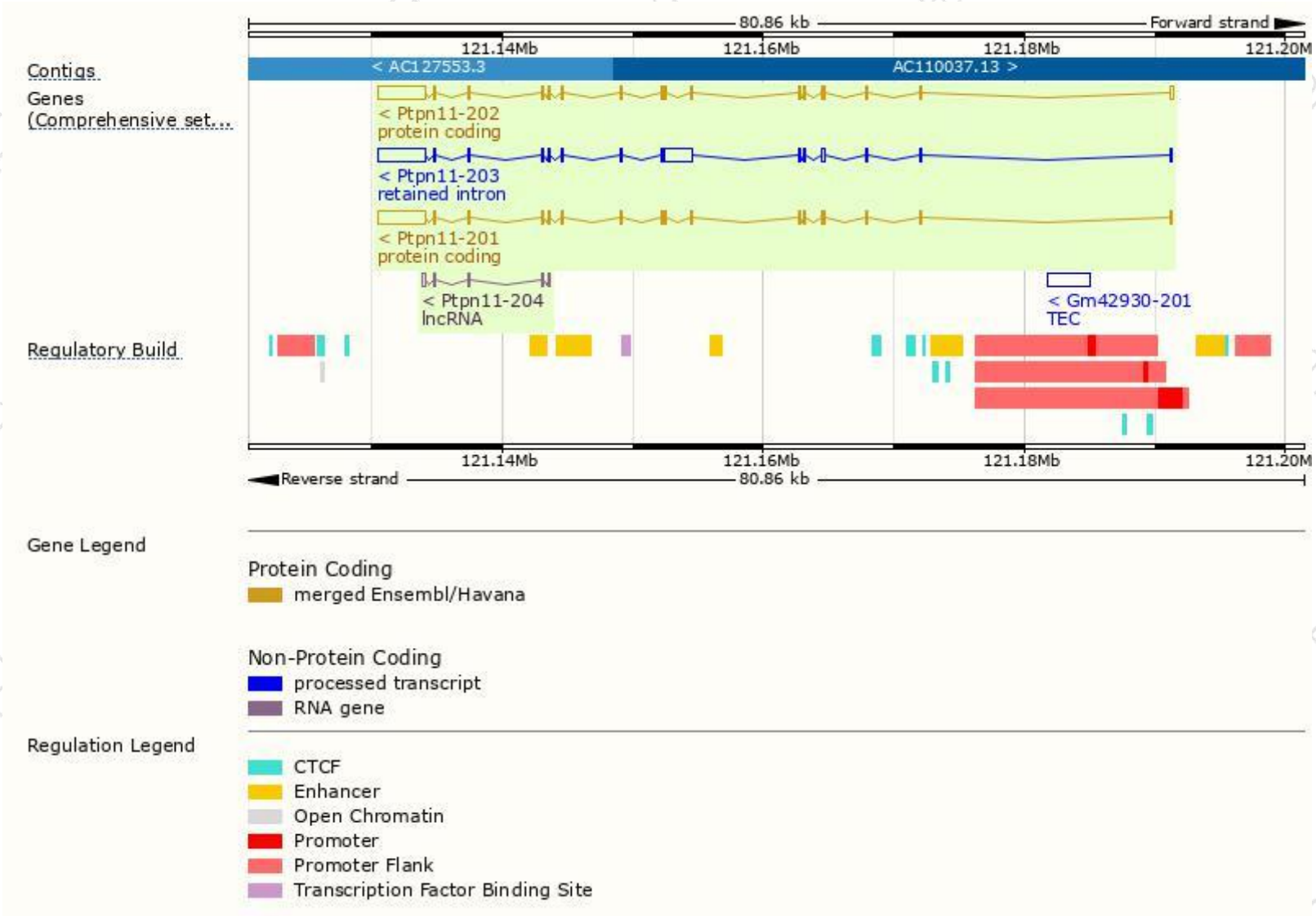
The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Ptpn11-202	ENSMUST00000100770.8	5599	593aa	Protein coding	CCDS51637	P35235	TSL:1 GENCODE basic APPRIS ALT1
Ptpn11-201	ENSMUST00000054547.8	5535	597aa	Protein coding	CCDS39247	P35235	TSL:1 GENCODE basic APPRIS P3
Ptpn11-204	ENSMUST00000148871.1	737	No protein	Processed transcript	-	-	TSL:2
Ptpn11-203	ENSMUST00000148407.7	7442	No protein	Retained intron	-	-	TSL:2

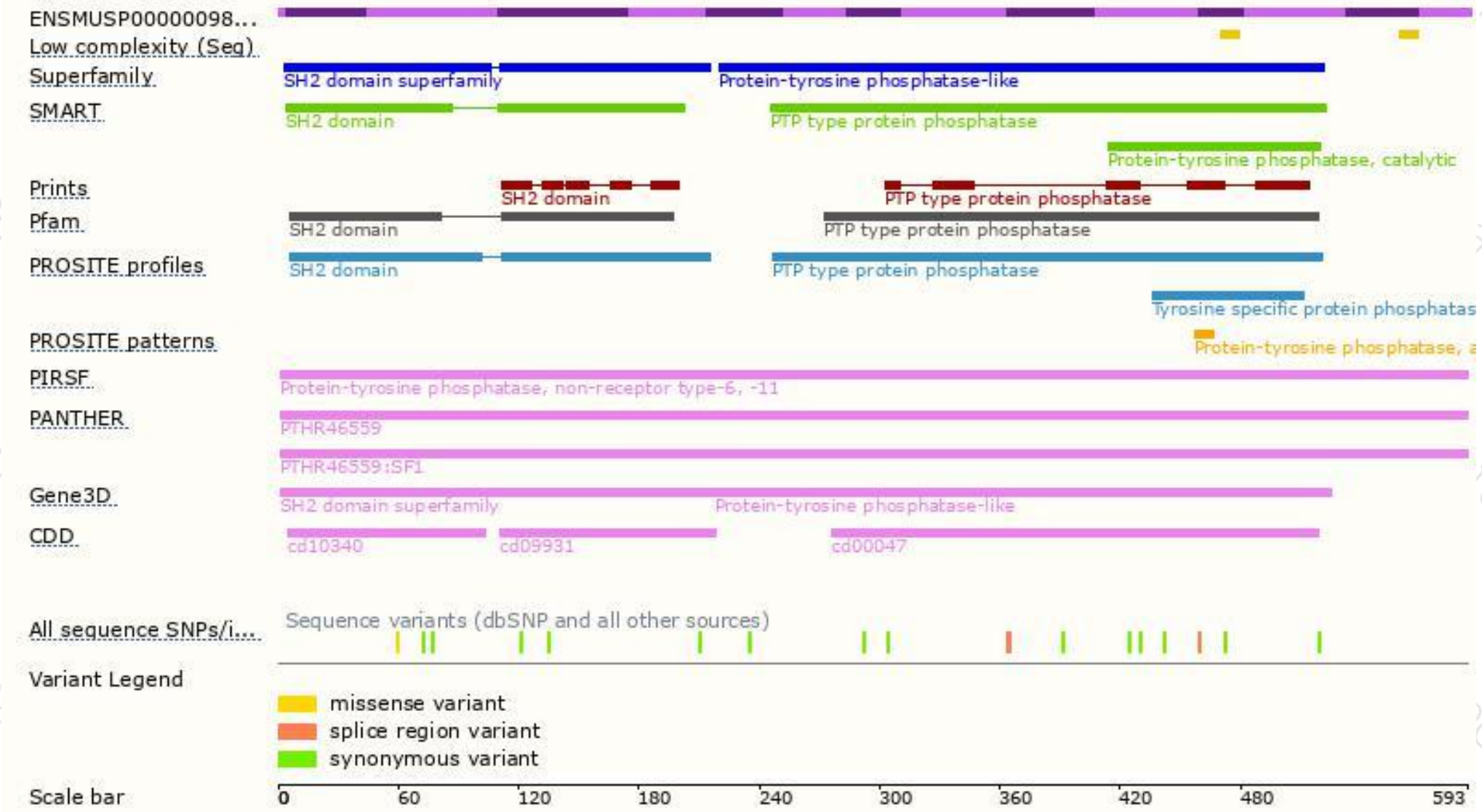
The strategy is based on the design of *Ptpn11-201* transcript,The transcription is shown below



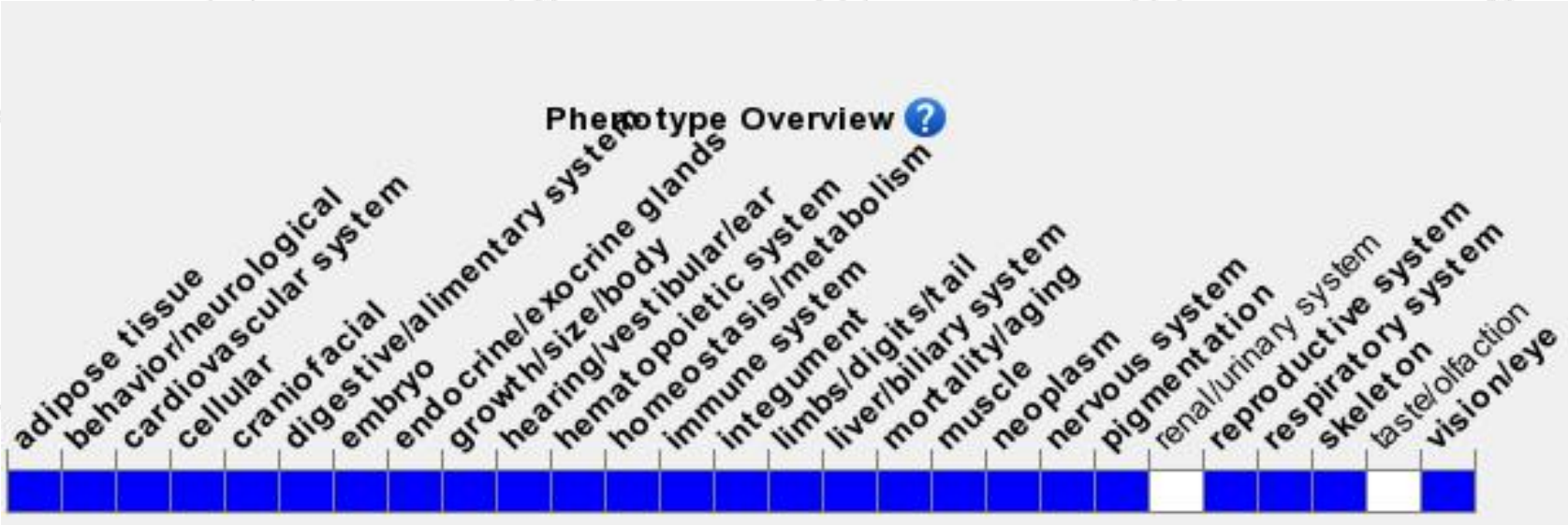
Genomic location distribution



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/).

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

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