Erap1 Cas9-CKO Strategy

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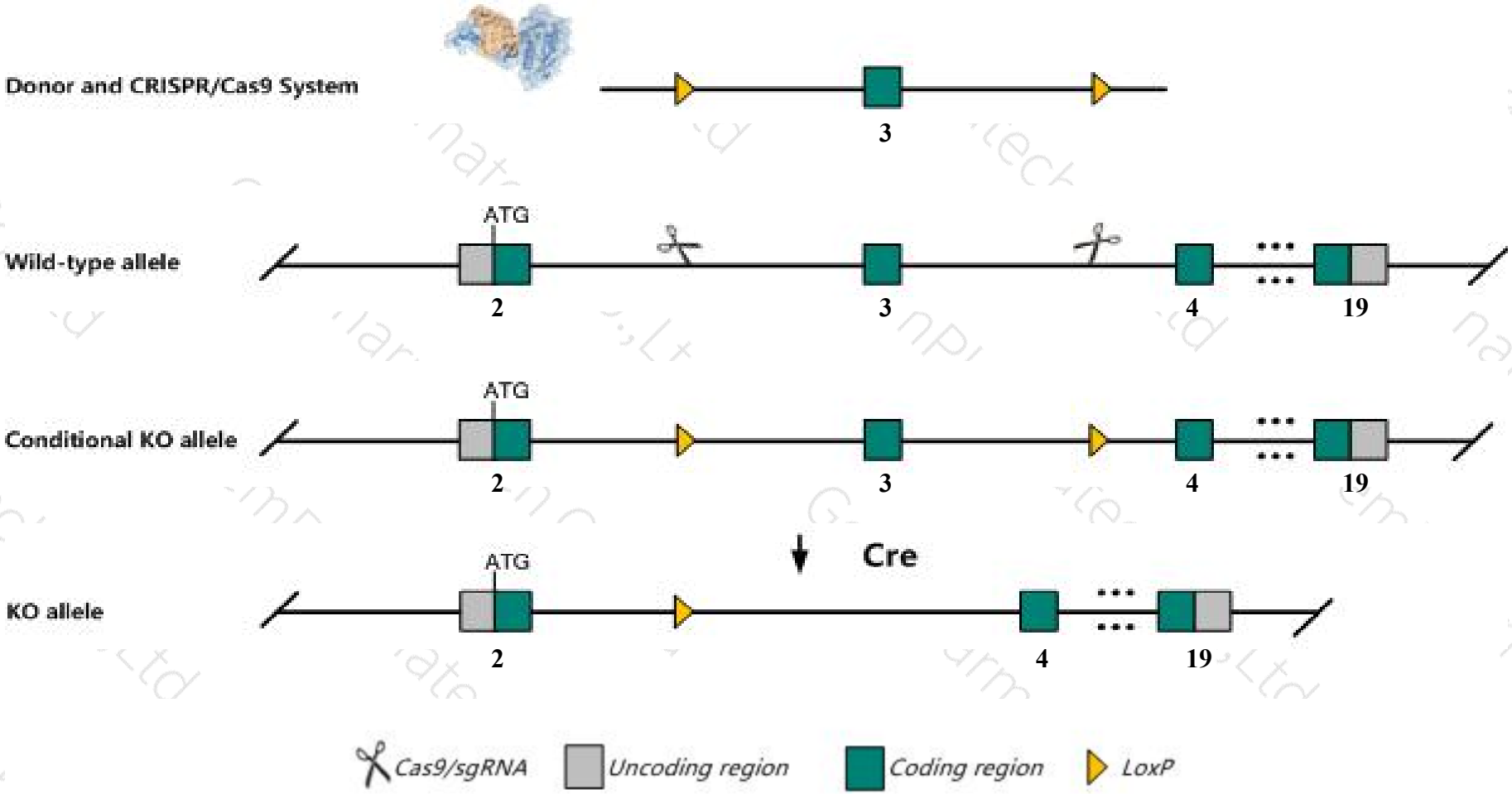
Project Overview

Project Name	***Erap1***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Erap1* gene. The schematic diagram is as follows:



Technical routes

- The *Erap1* gene has 6 transcripts. According to the structure of *Erap1* gene, exon3 of *Erap1-201* (ENSMUST00000169114.2) transcript is recommended as the knockout region.The region contains 139bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Erap1* gene. The brief process is as follows:sgRNA was transcribed in vitro, donor vector was constructed.Cas9, sgRNA 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 was 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.

Notice

- According to the existing MGI data,Mice homozygous for a targeted mutation may exhibit extramedullary hematopoiesis of the spleen, thymus hyperplasia, or enlarged kidneys at older ages.

- Transcript *Erap1-203/204/206* may not be affected.

- The *Erap1* gene is located on the Chr13. 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）

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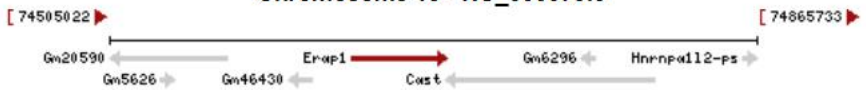
Erap1 endoplasmic reticulum aminopeptidase 1 [*Mus musculus* (house mouse)]

Gene ID: 80898, updated on 2-Nov-2019

Summary

Official Symbol	Erap1 provided by MGI
Official Full Name	endoplasmic reticulum aminopeptidase 1 provided by MGI
Primary source	MGI:MGI:1933403
See related	Ensembl:ENSMUSG00000021583
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	A-LAP; Arts1; ERAAP; PILSA; ARTS-1; PILSAP
Expression	Ubiquitous expression in bladder adult (RPKM 8.6), large intestine adult (RPKM 8.2) and 27 other tissues See more
Orthologs	human all

Chromosome 13 - NC_000079.6

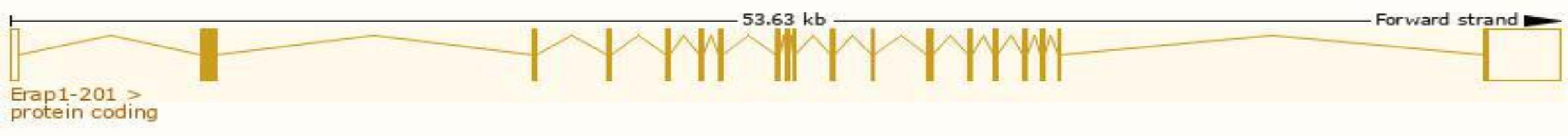


Transcript information（Ensembl）

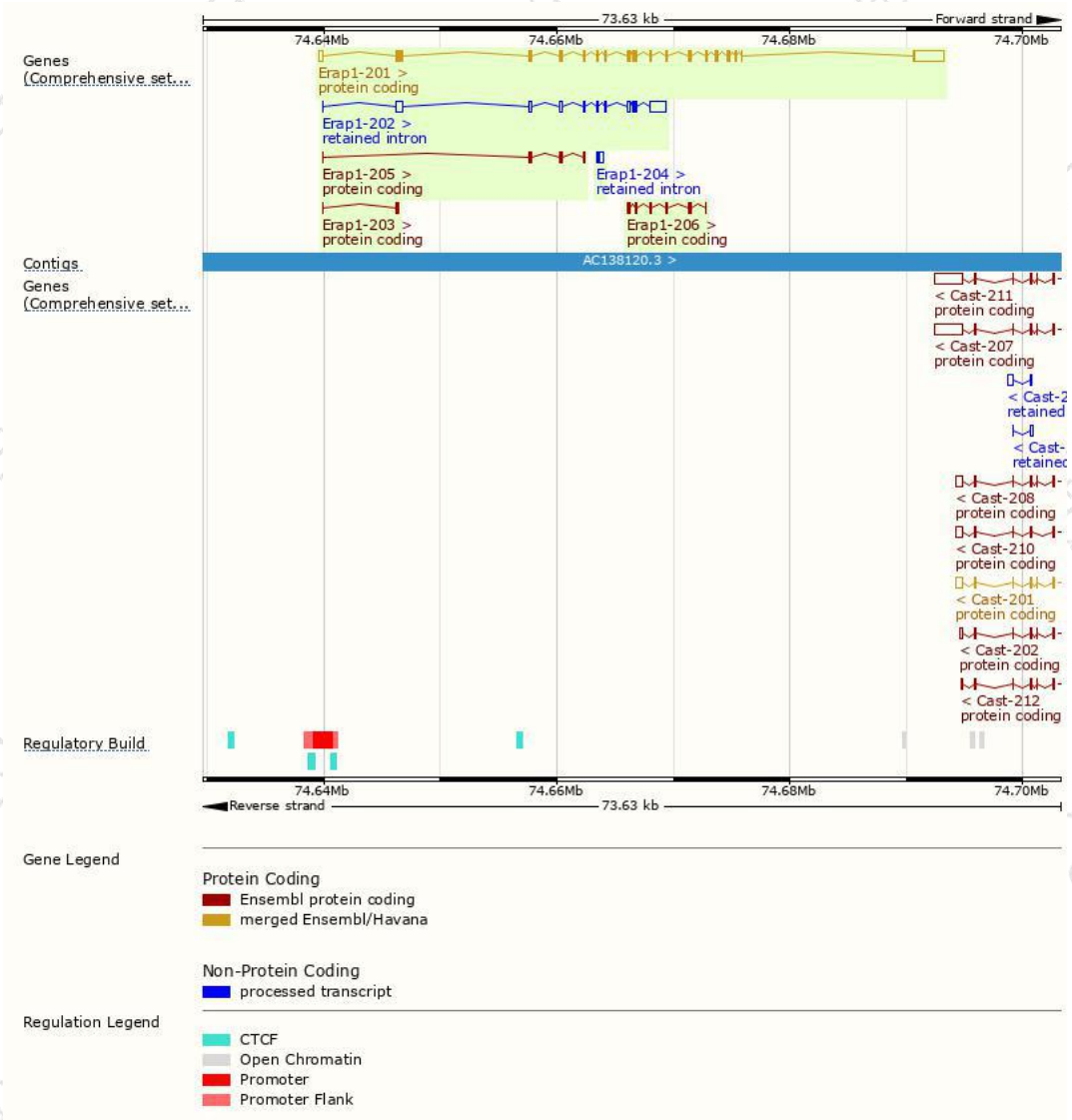
The gene has 6 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Translation ID	Biotype	CCDS	UniProt	Flags
Erap1-201	ENSMUST00000169114.2	5644	930aa	ENSMUSP00000133166.1	Protein coding	CCDS26647	Q9EQH2	TSL:1 GENCODE basic APPRIS P1
Erap1-206	ENSMUST00000222127.1	660	220aa	ENSMUSP00000152076.1	Protein coding	-	A0A1Y7VMT6	CDS 5' and 3' incomplete TSL:3
Erap1-205	ENSMUST00000221822.1	366	95aa	ENSMUSP00000152705.1	Protein coding	-	A0A1Y7VNY4	CDS 3' incomplete TSL:3
Erap1-203	ENSMUST00000221526.1	354	78aa	ENSMUSP00000152462.1	Protein coding	-	A0A1Y7VNJ8	CDS 3' incomplete TSL:2
Erap1-202	ENSMUST00000220594.1	3009	No protein	-	Retained intron	-	-	TSL:1
Erap1-204	ENSMUST00000221606.1	420	No protein	-	Retained intron	-	-	TSL:2

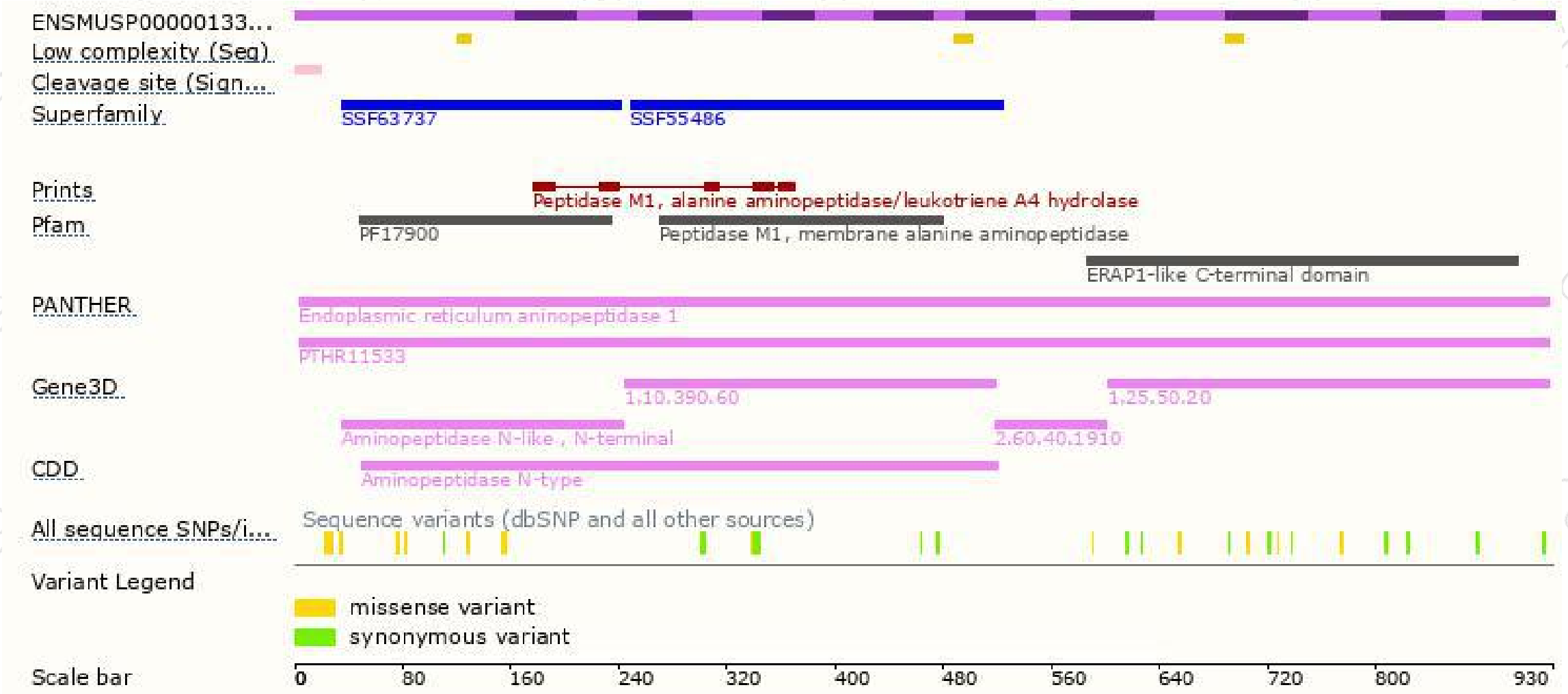
The strategy is based on the design of *Erap1-201* transcript,The transcription is shown below



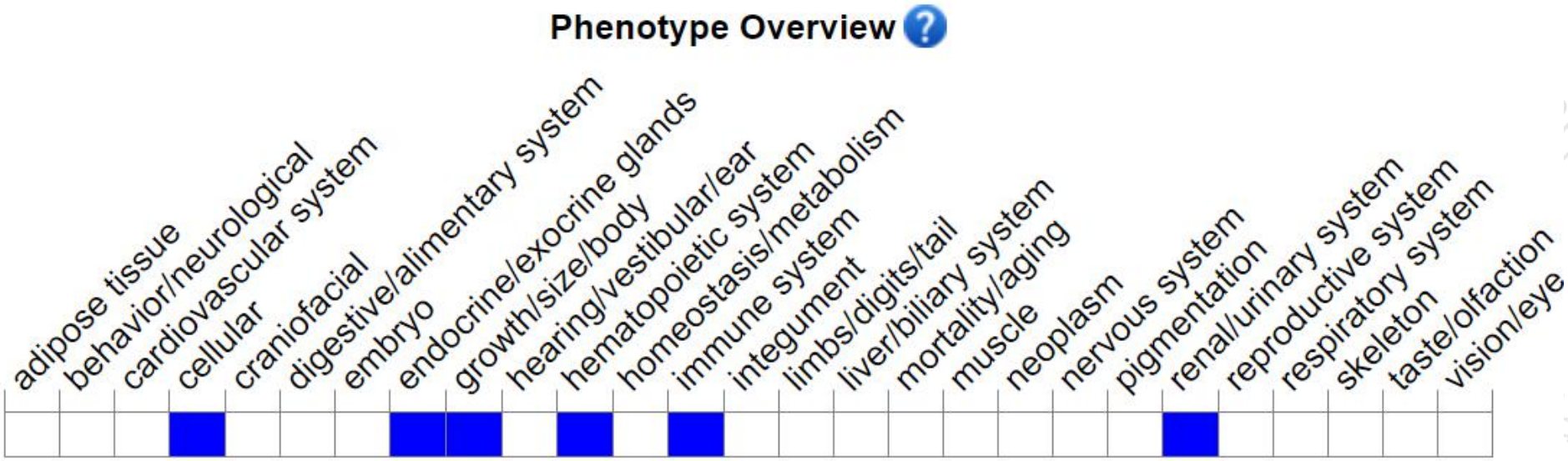
Genomic location distribution



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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