

Tac2 Cas9-CKO Strategy

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Reviewer:

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Design Date:

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Project Overview

Project Name

Tac2

Project type

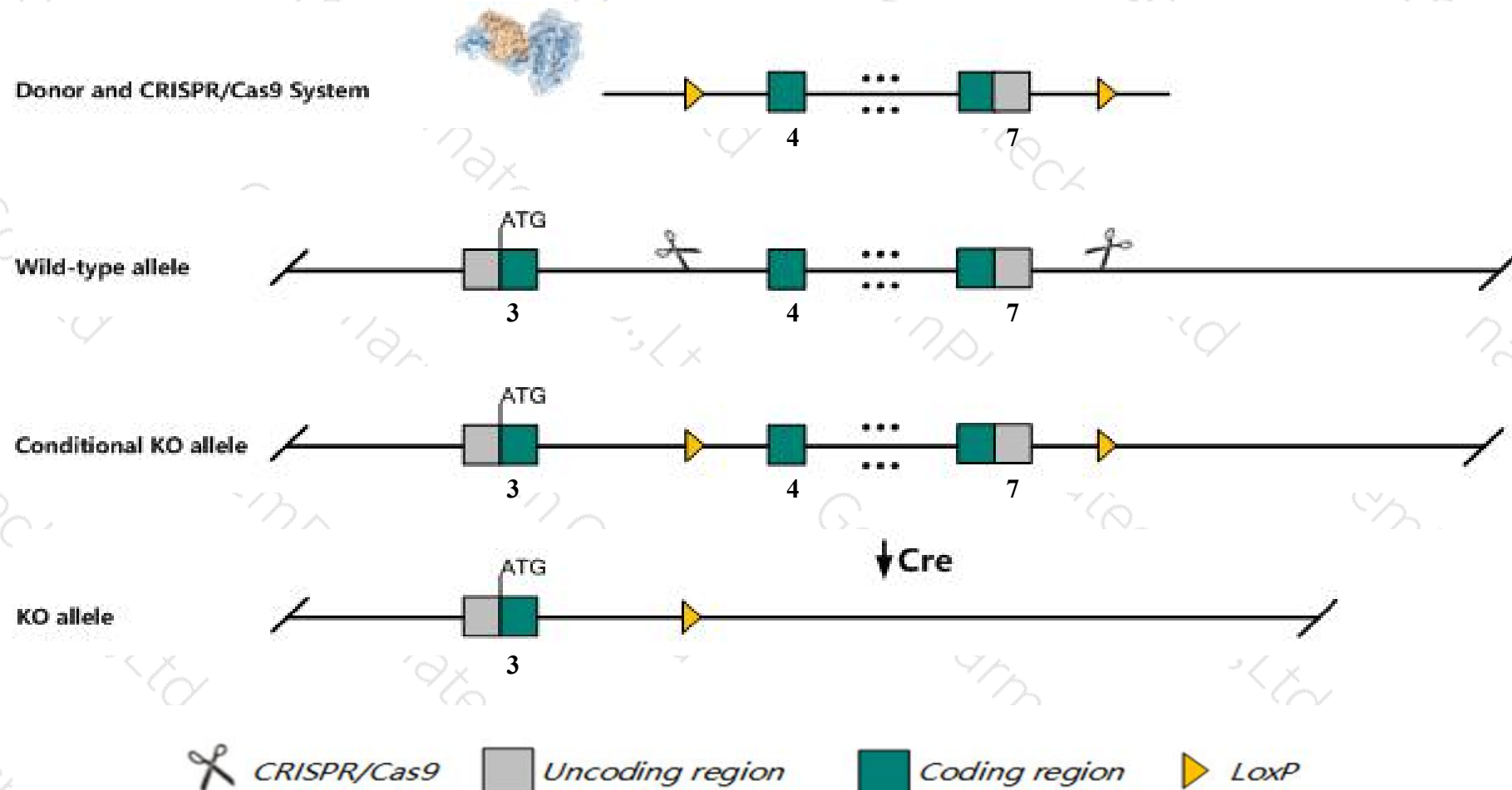
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Tac2* gene. The schematic diagram is as follows:



- The *Tac2* gene has 4 transcripts. According to the structure of *Tac2* gene, exon4-exon7 of *Tac2-202* (ENSMUST00000179960.7) transcript is recommended as the knockout region. The region contains 247bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Tac2* 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.

Notice

- According to the existing MGI data, Mice homozygous for a knock-out allele exhibit delayed female sexual maturation and fertility.
- The *Tac2* gene is located on the Chr10. 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)

Tac2 tachykinin 2 [Mus musculus (house mouse)]

Gene ID: 21334, updated on 31-Jan-2019

Summary



Official Symbol Tac2 provided by [MGI](#)

Official Full Name tachykinin 2 provided by [MGI](#)

Primary source [MGI:MGI:98476](#)

See related [Ensembl:ENSMUSG00000025400](#)

Gene type protein coding

RefSeq status REVIEWED

Organism [Mus musculus](#)

Lineage Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus

Also known as PPT-B, Tac3

Summary This gene encodes a member of the tachykinin family of signaling peptides that is widely expressed in the central nervous system and plays a role in diverse processes such as water homeostasis, pulmonary inflammation, cognition, fear memory consolidation and preeclampsia. The encoded protein is enzymatically processed to generate the mature neuropeptide. Alternative splicing results in multiple transcript variants. [provided by RefSeq, Jul 2015]

Expression Biased expression in liver E14.5 (RPKM 9.9), liver E14 (RPKM 8.0) and 9 other tissues [See more](#)

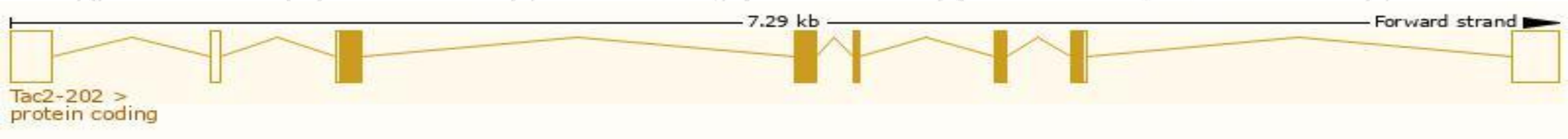
Orthologs [human](#) [all](#)

Transcript information (Ensembl)

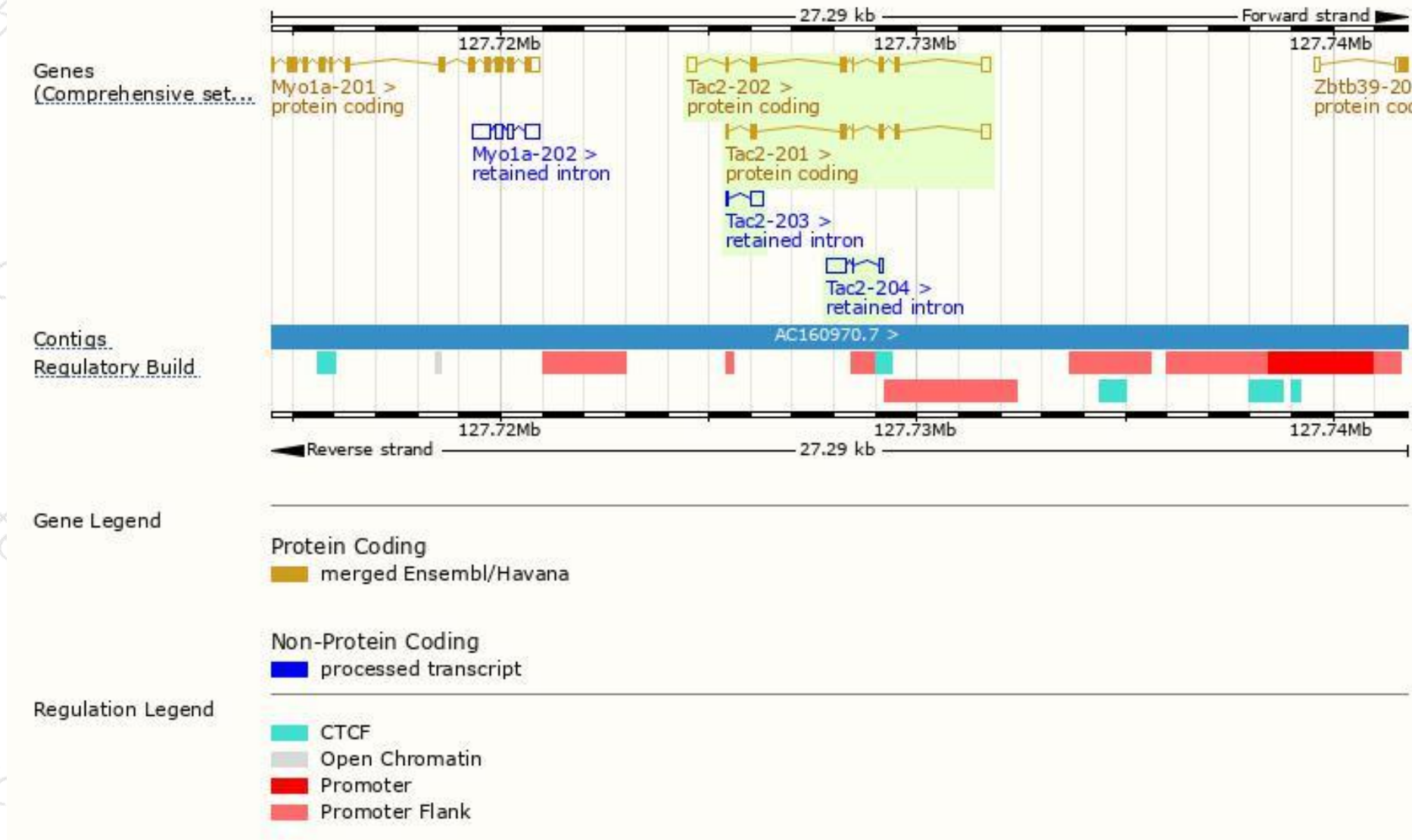
The gene has 4 transcripts,all transcripts are shown below:

| Name | Transcript ID | bp | Protein | Biotype | CCDS | UniProt | Flags |
|----------|--------------------------------------|-----|-----------------------|-----------------|---------------------------|------------------------|-------------------------------|
| Tac2-202 | ENSMUST00000179960.7 | 852 | 116aa | Protein coding | CCDS24248 | P55099 | TSL:1 GENCODE basic APPRIS P1 |
| Tac2-201 | ENSMUST00000026466.4 | 678 | 116aa | Protein coding | CCDS24248 | P55099 | TSL:1 GENCODE basic APPRIS P1 |
| Tac2-204 | ENSMUST00000218048.1 | 514 | No protein | Retained intron | - | - | TSL:5 |
| Tac2-203 | ENSMUST00000217729.1 | 358 | No protein | Retained intron | - | - | TSL:3 |

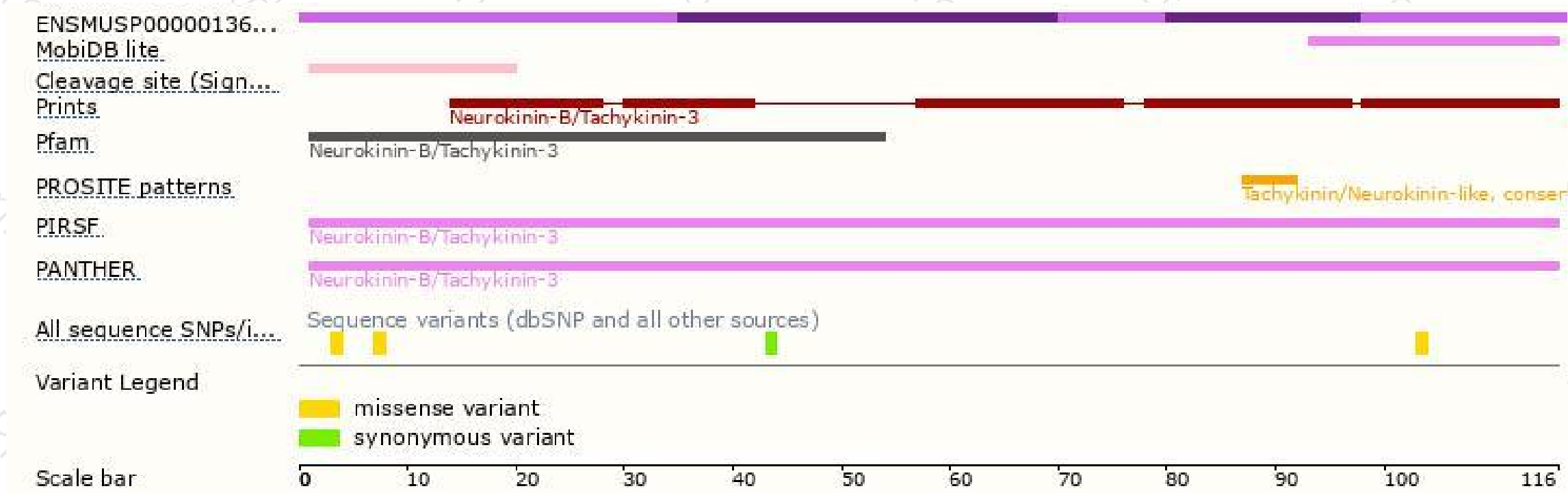
The strategy is based on the design of *Tac2-202* transcript,The transcription is shown below



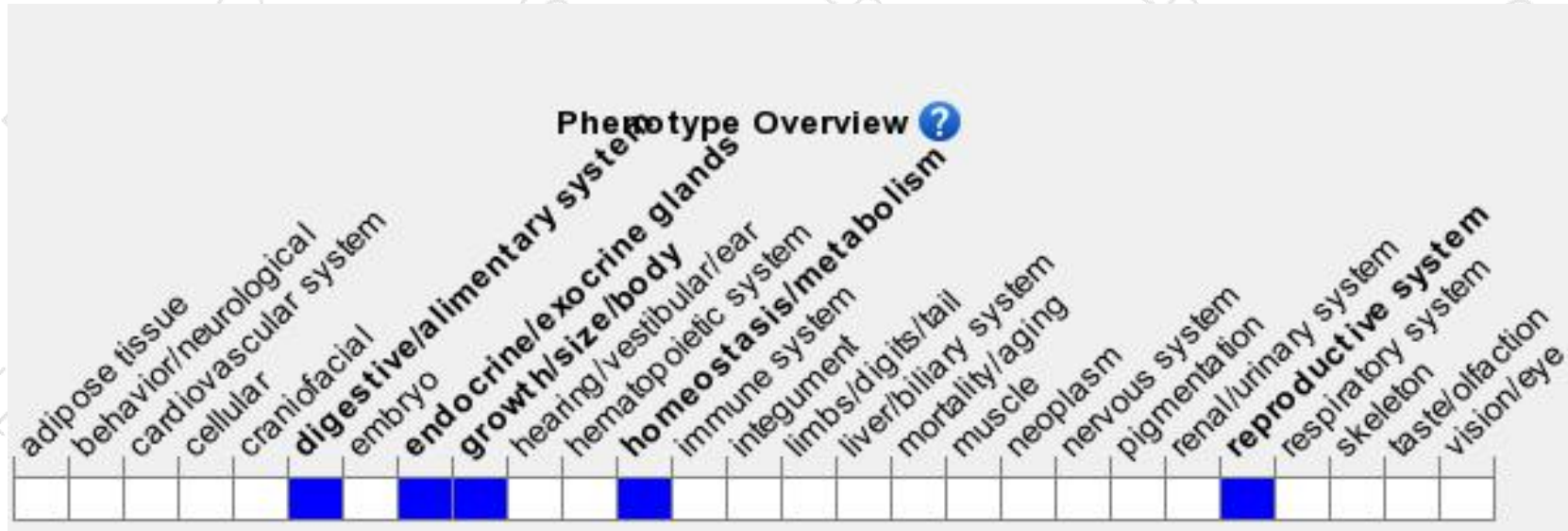
Genomic location distribution



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, Mice homozygous for a knock-out allele exhibit delayed female sexual maturation and fertility.

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

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