

Txndc2 Cas9-CKO Strategy

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Reviewer: JiaYu

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Project Overview

Project Name

Txndc2

Project type

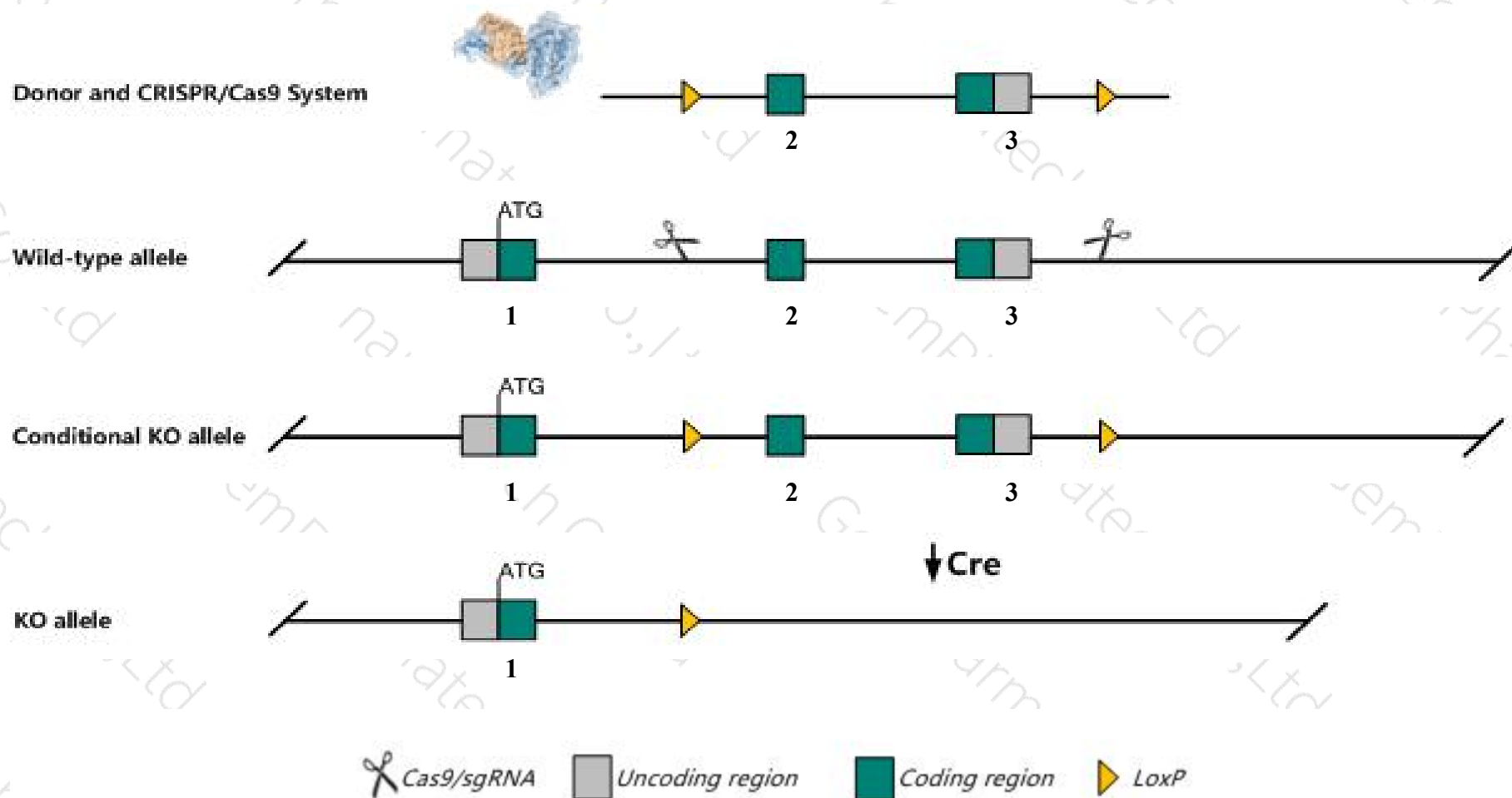
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Txndc2* gene. The schematic diagram is as follows:



- The *Txndc2* gene has 2 transcripts. According to the structure of *Txndc2* gene, exon2-exon3 of *Txndc2*-201(ENSMUST00000050236.6) transcript is recommended as the knockout region. The region contains 1648bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Txndc2* 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.

- According to the existing MGI data, homozygous mutation of this gene displays normal reproductive system phenotype while results in increased body size, increased serum phosphorus level and decreased serum IL-6 response to LPS challenge.
- The *Txndc2* gene is located on the Chr17. 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)

Txndc2 thioredoxin domain containing 2 (spermatozoa) [Mus musculus (house mouse)]

Gene ID: 213272, updated on 13-Mar-2020

Summary



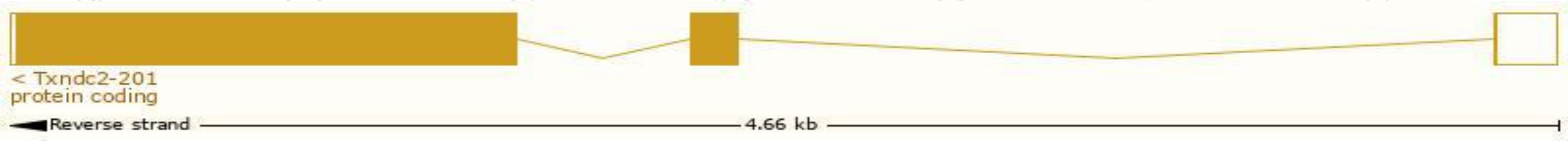
Official Symbol	Txndc2 provided by MGI
Official Full Name	thioredoxin domain containing 2 (spermatozoa) provided by MGI
Primary source	MGI:MGI:2389312
See related	Ensembl:ENSMUSG00000050612
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	AU021712, Sptrx-1, Sptrx1, Trx4
Expression	Restricted expression toward testis adult (RPKM 67.4) See more
Orthologs	human all

Transcript information (Ensembl)

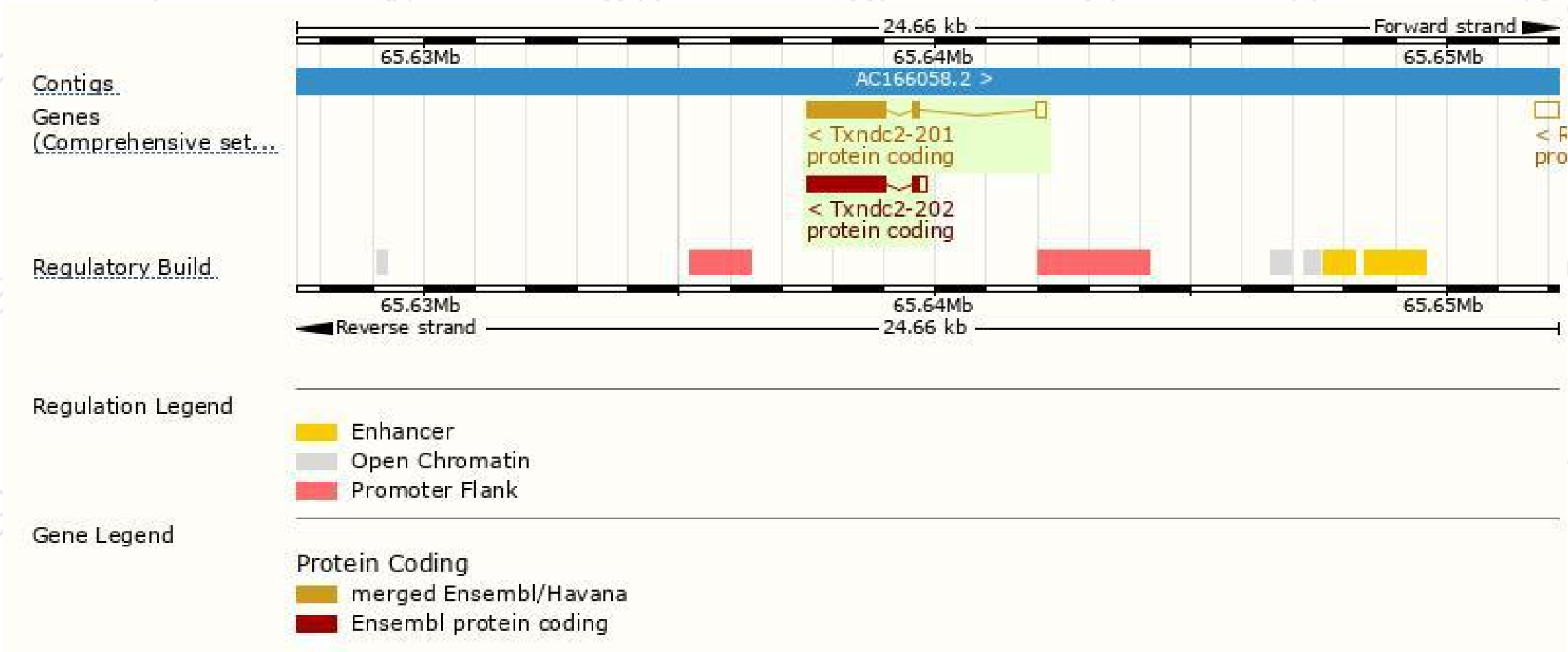
The gene has 2 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Txndc2-201	ENSMUST00000050236.6	1861	550aa	Protein coding	CCDS50165	H7BX21	TSL:1 GENCODE basic APPRIS P2
Txndc2-202	ENSMUST00000233702.1	1788	543aa	Protein coding	-	A0A3B2W416	GENCODE basic APPRIS ALT2

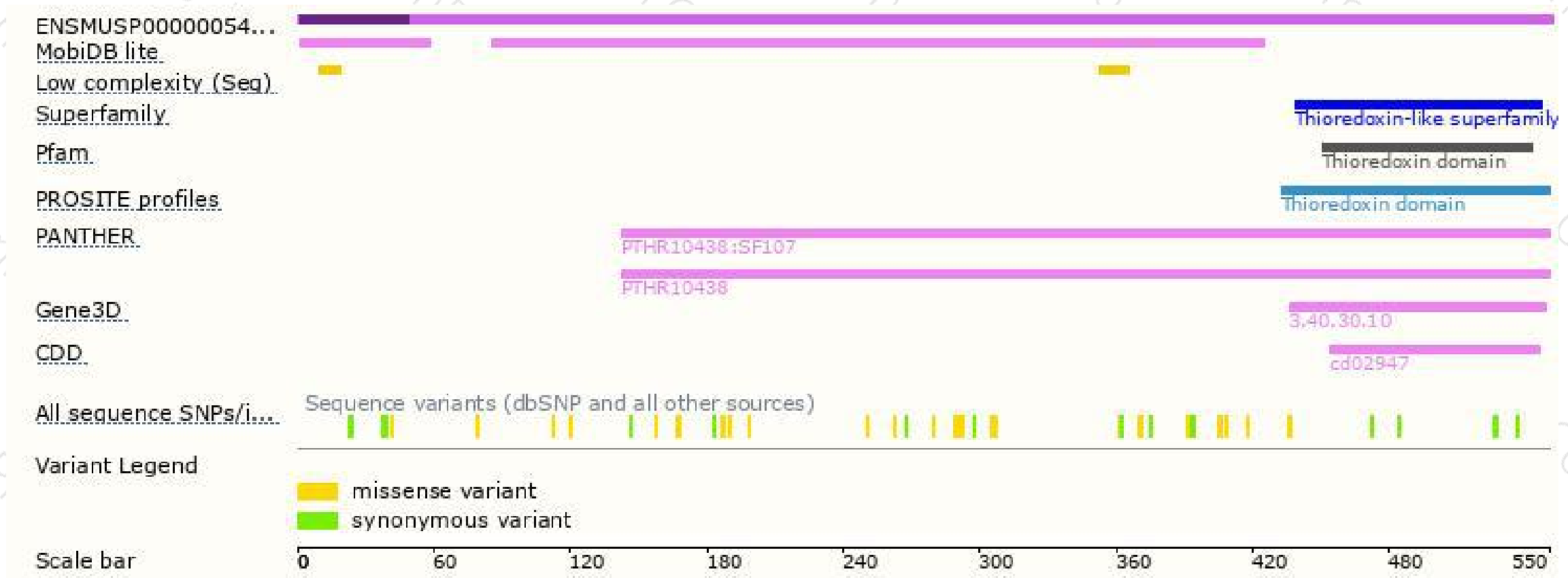
The strategy is based on the design of *Txndc2-201* transcript,the transcription is shown below:



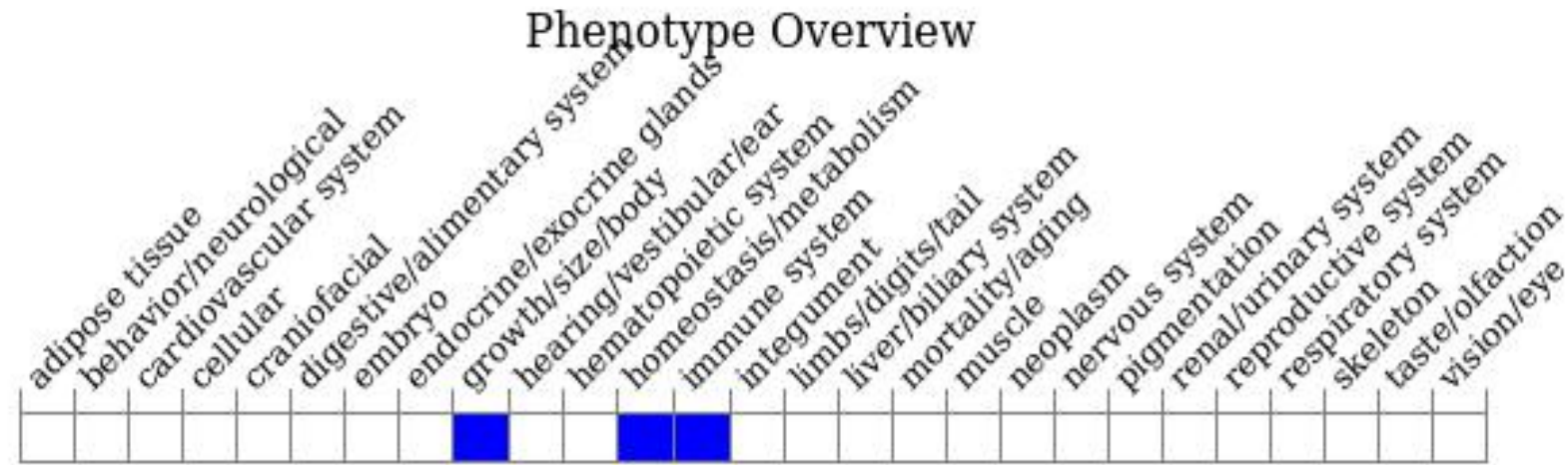
Genomic location distribution



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, homozygous mutation of this gene displays normal reproductive system phenotype while results in increased body size, increased serum phosphorus level and decreased serum IL-6 response to LPS challenge.

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

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