Sox17 Cas9-CKO Strategy

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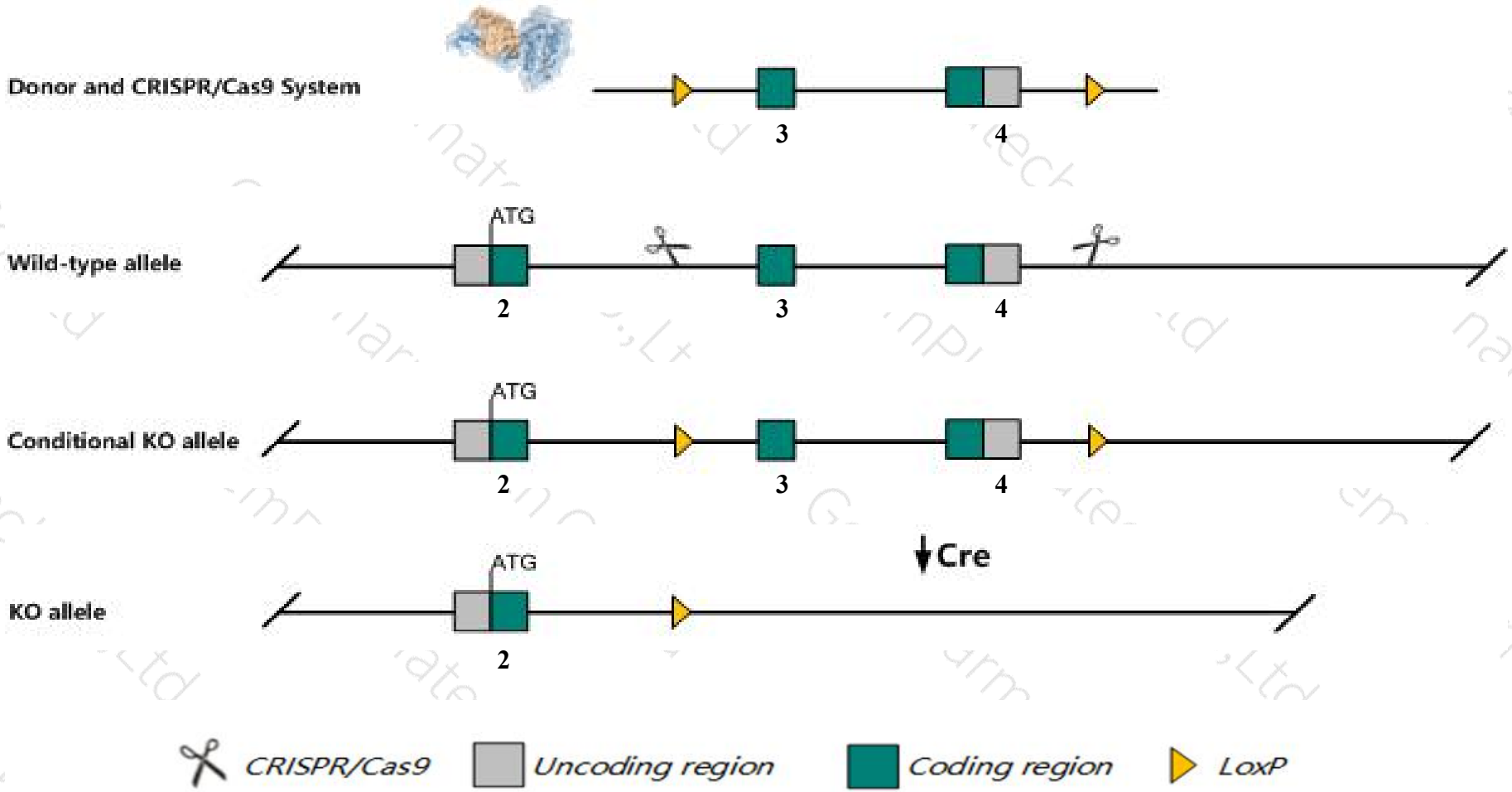
Project Overview

Project Name	***Sox17***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Sox17* gene. The schematic diagram is as follows:



Technical routes

- The *Sox17* gene has 8 transcripts. According to the structure of *Sox17* gene, exon3-exon4 of *Sox17-206* (ENSMUST00000192650.5) transcript is recommended as the knockout region.The region contains 1045bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Sox17* 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,Embryos homozygous for a targeted null mutation develop a deficient gut endoderm and die around embryonic day 10.5.

- The effect on transcript *Sox17*-203&204&207 is unknown.

- The *Sox17* gene is located on the Chr1. 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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Sox17 SRY (sex determining region Y)-box 17 [*Mus musculus* (house mouse)]

Gene ID: 20671, updated on 14-Aug-2019

Summary

Official Symbol	Sox17 provided by MGI
Official Full Name	SRY (sex determining region Y)-box 17 provided by MGI
Primary source	MGI:MGI:107543
See related	Ensembl:ENSMUSG00000025902
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
Summary	This gene encodes a member of the Sox (Sry-related high mobility group box) family of transcription factors involved in the regulation of embryonic development. The encoded protein plays a role in the determination of cell fate and in maintaining cell identity. This gene regulates tumor angiogenesis and tumor progression. Mutations in the human gene are associated with vesicoureteral reflux, characterized by the backward flow of urine from the bladder into the ureters or the kidney. Alternative splicing results in multiple transcript variants. [provided by RefSeq, Jan 2014]
Expression	Broad expression in ovary adult (RPKM 33.5), lung adult (RPKM 29.7) and 19 other tissues See more
Orthologs	human all

Genomic context

Location: 1 A1; 1 1.65 cM

See Sox17 in Genome Data Viewer

Exon count: 5

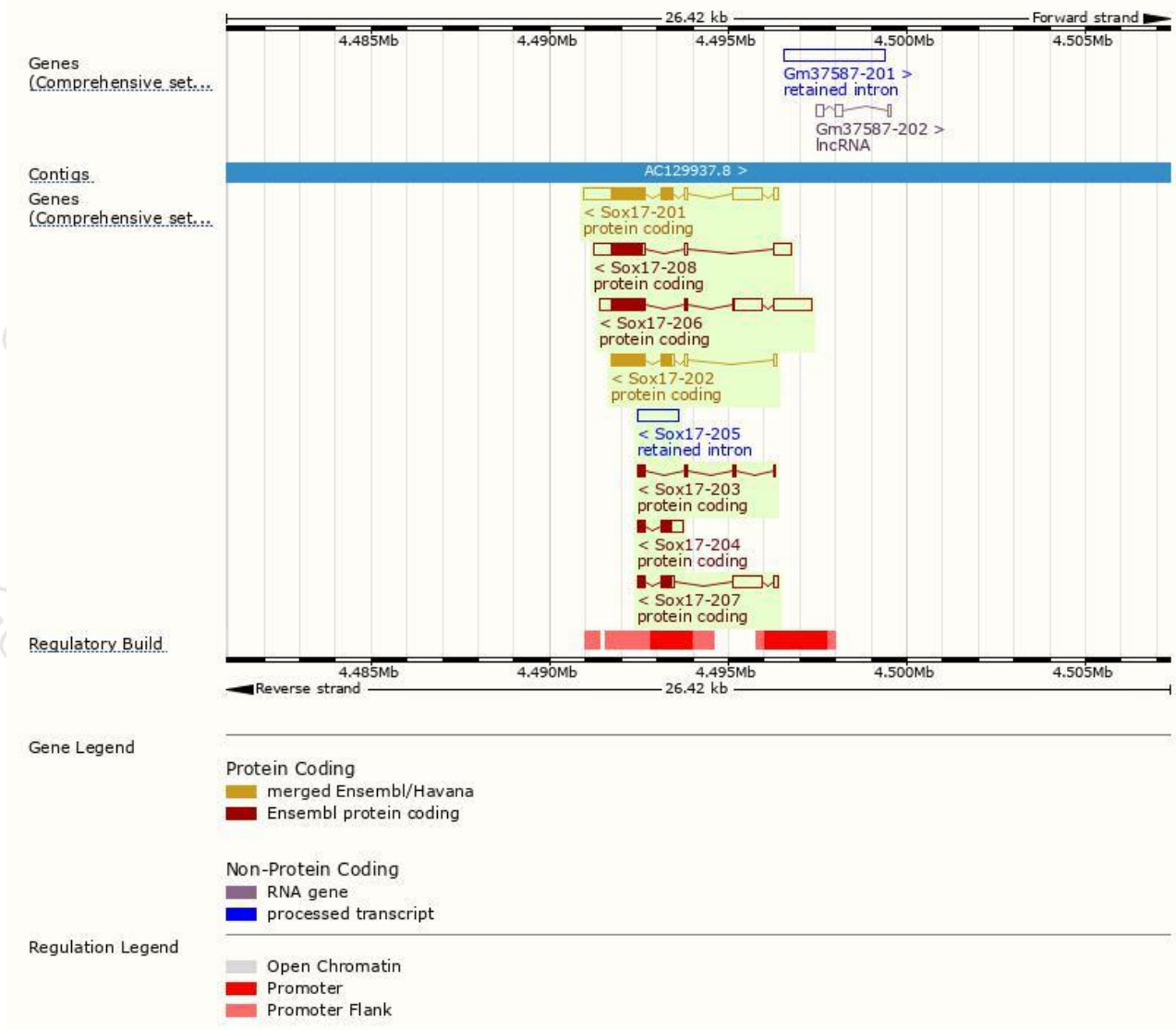
Transcript information（Ensembl）

The gene has 8 transcripts,all transcripts are shown below:

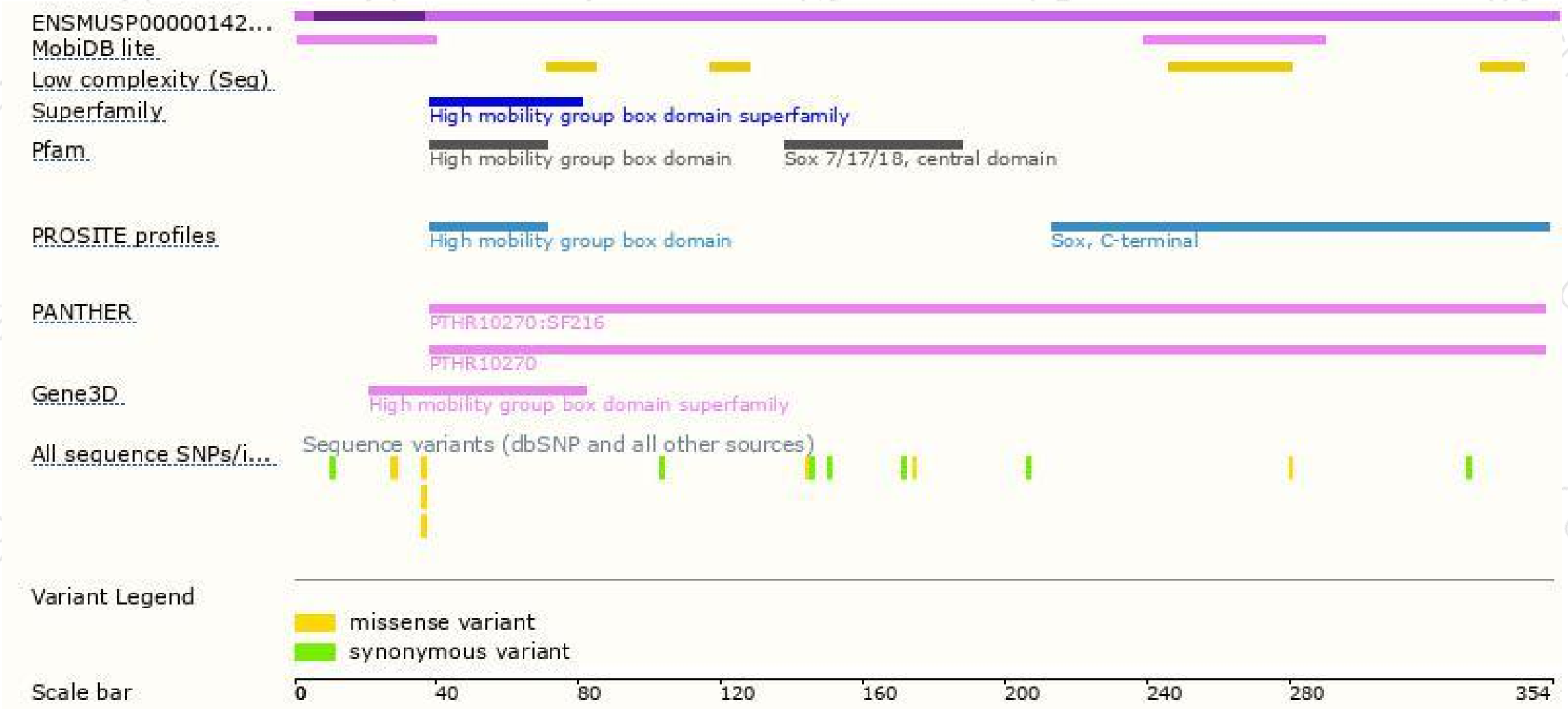
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Sox17-206	ENSMUST00000192650.5	3242	354aa	Protein coding	CCDS78539	A0A0A6YXS3	TSL:1 GENCODE basic
Sox17-201	ENSMUST00000027035.9	3127	419aa	Protein coding	CCDS14805	Q61473	TSL:1 GENCODE basic APPRIS P1
Sox17-208	ENSMUST00000195555.1	1977	291aa	Protein coding	CCDS78538	Q61473	TSL:5 GENCODE basic
Sox17-202	ENSMUST00000116652.7	1512	419aa	Protein coding	CCDS14805	Q61473	TSL:1 GENCODE basic APPRIS P1
Sox17-207	ENSMUST00000192913.1	1506	169aa	Protein coding	-	A0A0A6YWS4	CDS 3' incomplete TSL:5
Sox17-204	ENSMUST00000191939.1	840	170aa	Protein coding	-	A0A0A6YXV3	CDS 3' incomplete TSL:1
Sox17-203	ENSMUST00000191647.1	406	107aa	Protein coding	-	A0A0A6YXZ2	CDS 3' incomplete TSL:5
Sox17-205	ENSMUST00000192505.1	1148	No protein	Retained intron	-	-	TSL:NA

The strategy is based on the design of *Sox17-206* transcript,The transcription is shown below

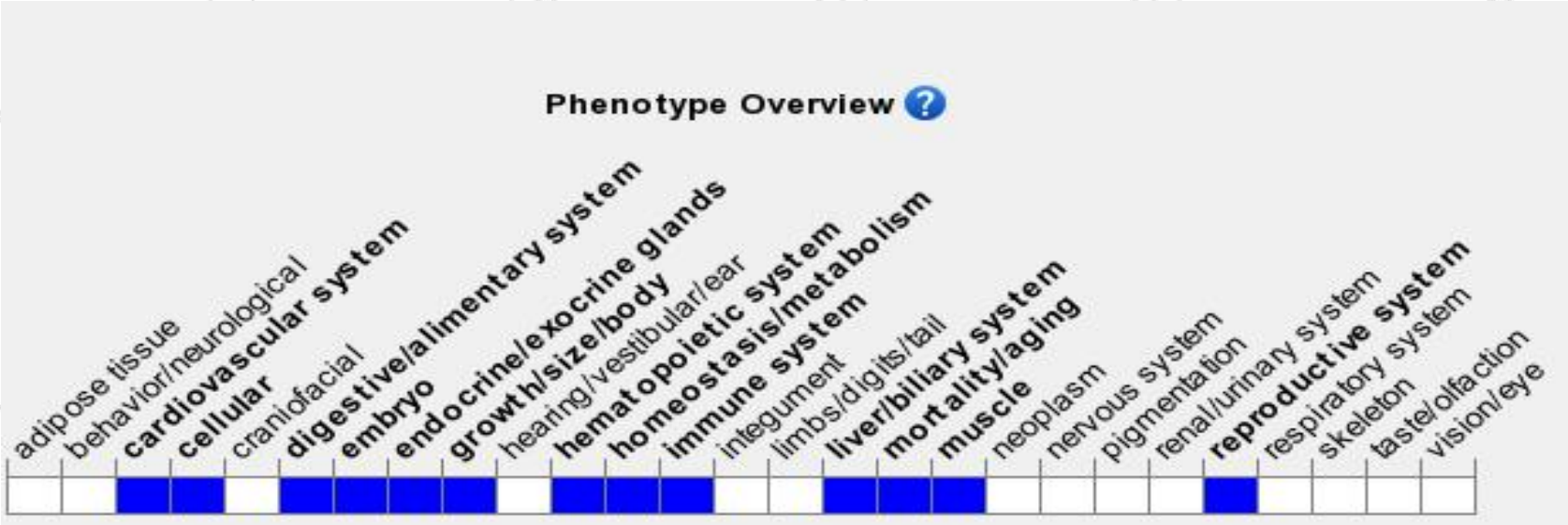
Genomic location distribution



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,Embryos homozygous for a targeted null mutation develop a deficient gut endoderm and die around embryonic day 10.5.

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

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