

Arl13b Cas9-CKO Strategy

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Project Overview

Project Name

Arl13b

Project type

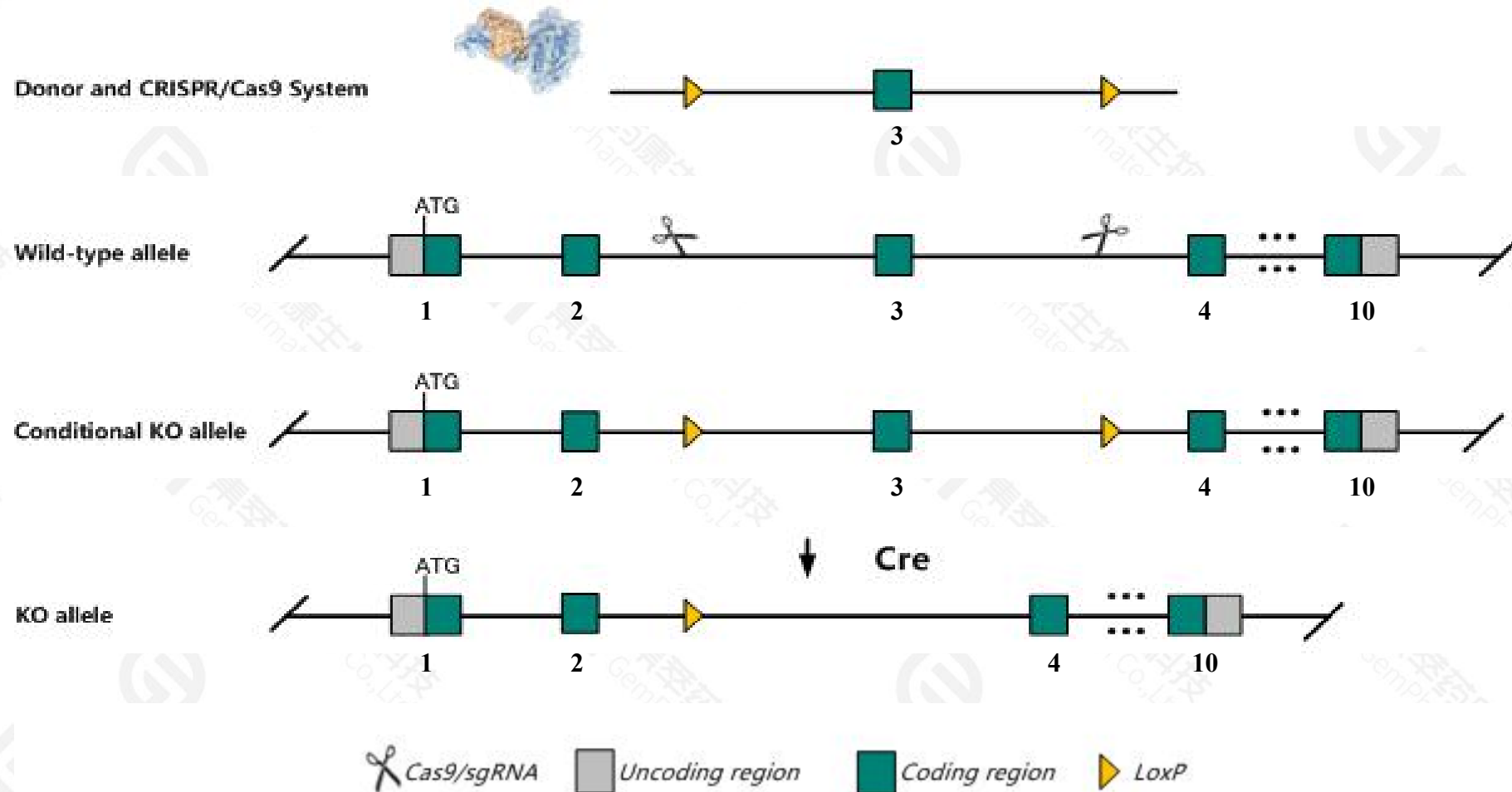
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Arl13b* gene. The schematic diagram is as follows:



Technical routes

- The *Arl13b* gene has 4 transcripts. According to the structure of *Arl13b* gene, exon3 of *Arl13b-201*(ENSMUST00000089289.6) transcript is recommended as the knockout region. The region contains 250bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Arl13b* gene. The brief process is as follows: sgRNA was transcribed in vitro, donor 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, mice homozygous for an ENU-induced mutation die at E13-E14 exhibiting left-right randomization and absence of the floor plate in the caudal spinal cord.
- The *Arl13b* gene is located on the Chr16. 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)

Arl13b ADP-ribosylation factor-like 13B [Mus musculus (house mouse)]

Gene ID: 68146, updated on 23-Feb-2021

Summary



Official Symbol Arl13b provided by [MGI](#)

Official Full Name ADP-ribosylation factor-like 13B provided by [MGI](#)

Primary source [MGI:MGI:1915396](#)

See related [Ensembl:ENSMUSG00000022911](#)

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 A530097K21Rik, A930014M17Rik, Ar, Arl2l1, C530009C10Rik, h, hnn

Expression Ubiquitous expression in limb E14.5 (RPKM 4.6), testis adult (RPKM 3.9) and 27 other tissues [See more](#)

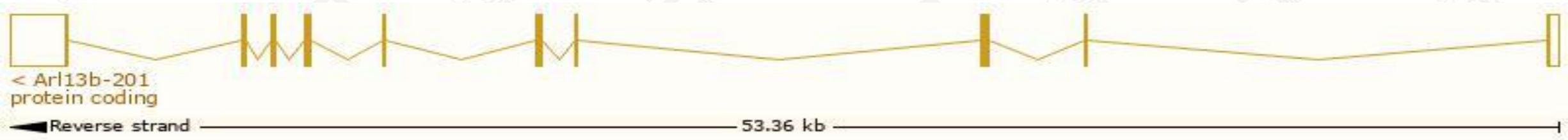
Orthologs [human](#) [all](#)

Transcript information (Ensembl)

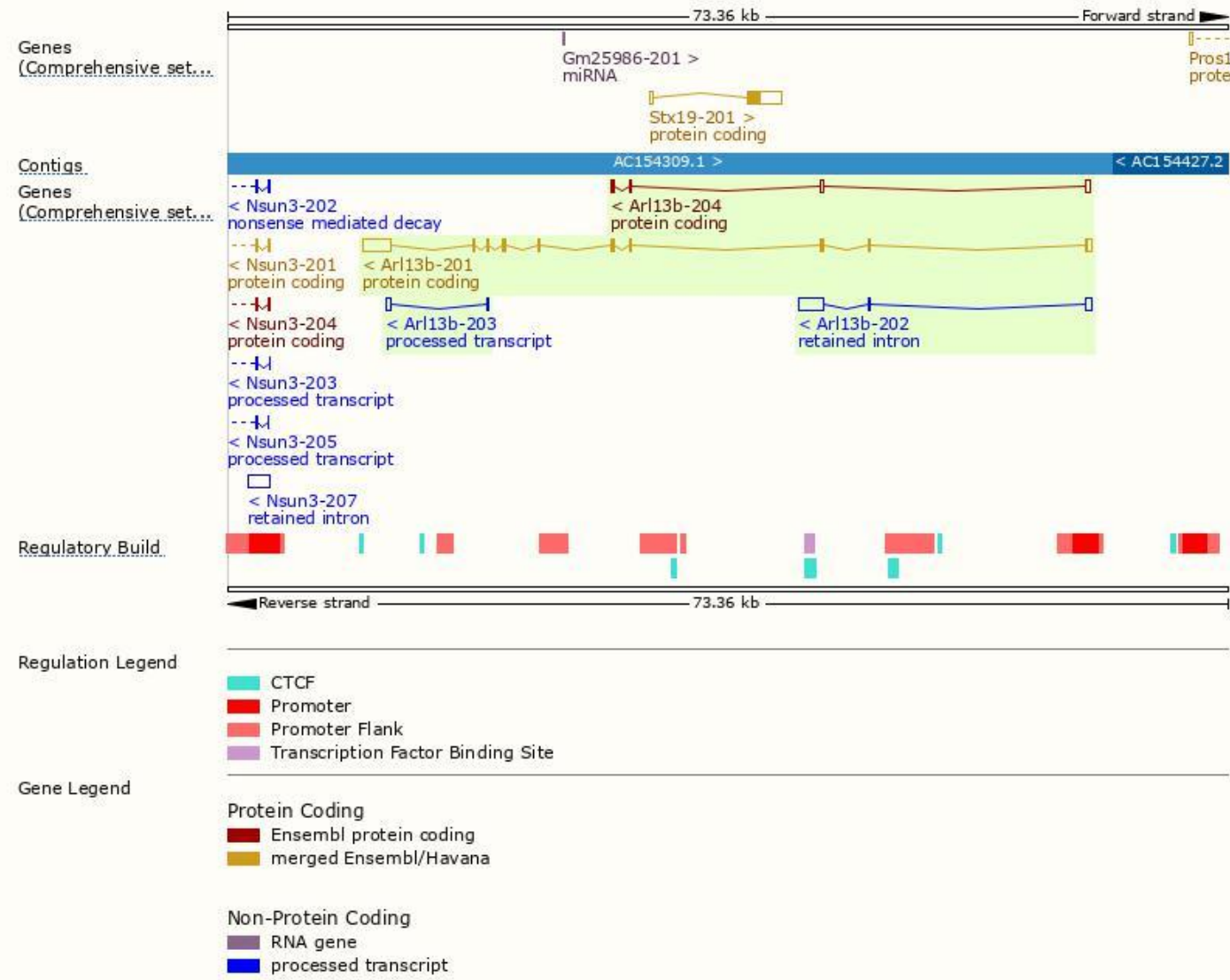
The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Arl13b-201	ENSMUST00000089289.6	3528	427aa	Protein coding	CCDS28261		TSL:5 , GENCODE basic , APPRIS P1 ,
Arl13b-204	ENSMUST00000232561.2	867	126aa	Protein coding	-		CDS 3' incomplete ,
Arl13b-203	ENSMUST00000141665.2	473	No protein	Processed transcript	-		TSL:3 ,
Arl13b-202	ENSMUST00000132902.2	2236	No protein	Retained intron	-		TSL:2 ,

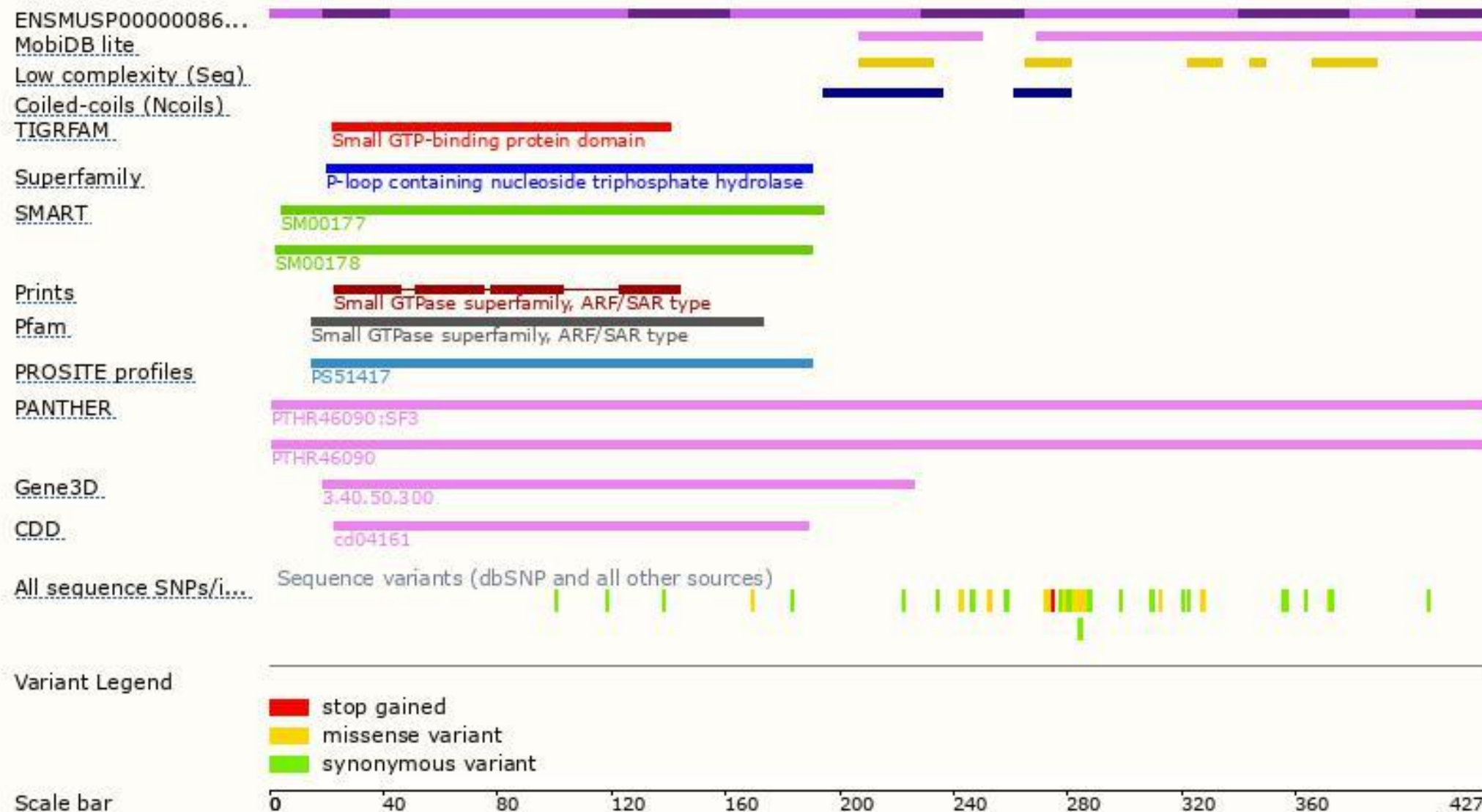
The strategy is based on the design of *Arl13b-201* transcript,the transcription is shown below:



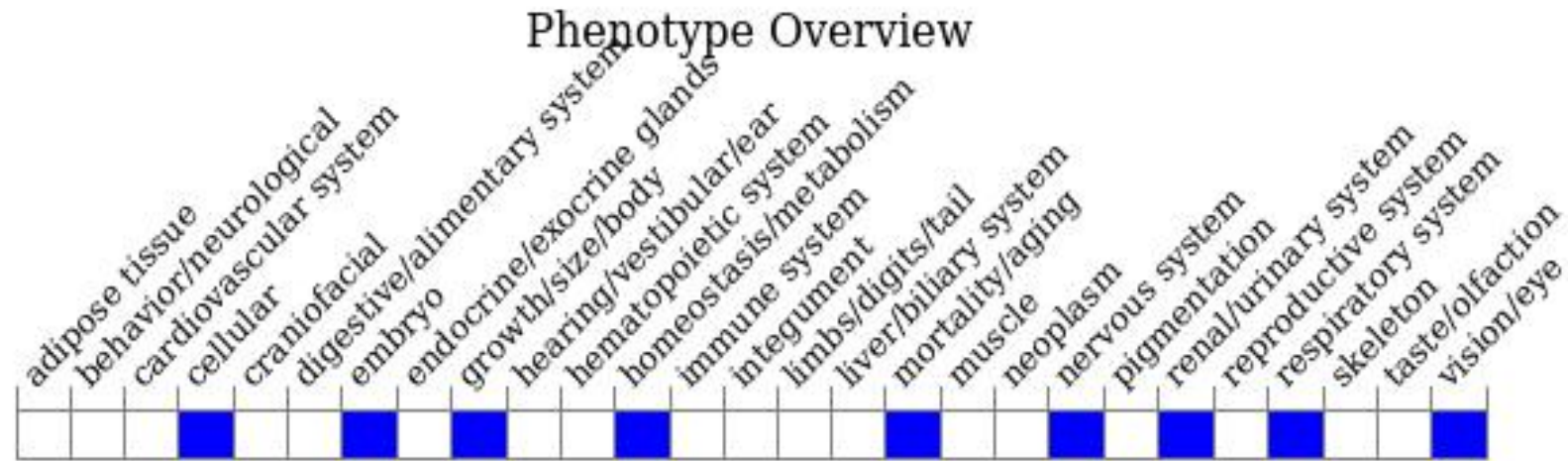
Genomic location distribution



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, mice homozygous for an ENU-induced mutation die at E13-E14 exhibiting left-right randomization and absence of the floor plate in the caudal spinal cord.

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

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