

Naa10 Cas9-CKO Strategy

Designer: Ruirui Zhang

Reviewer: Daohua Xu

Design Date: 2021-5-8

Project Overview

Project Name

Naa10

Project type

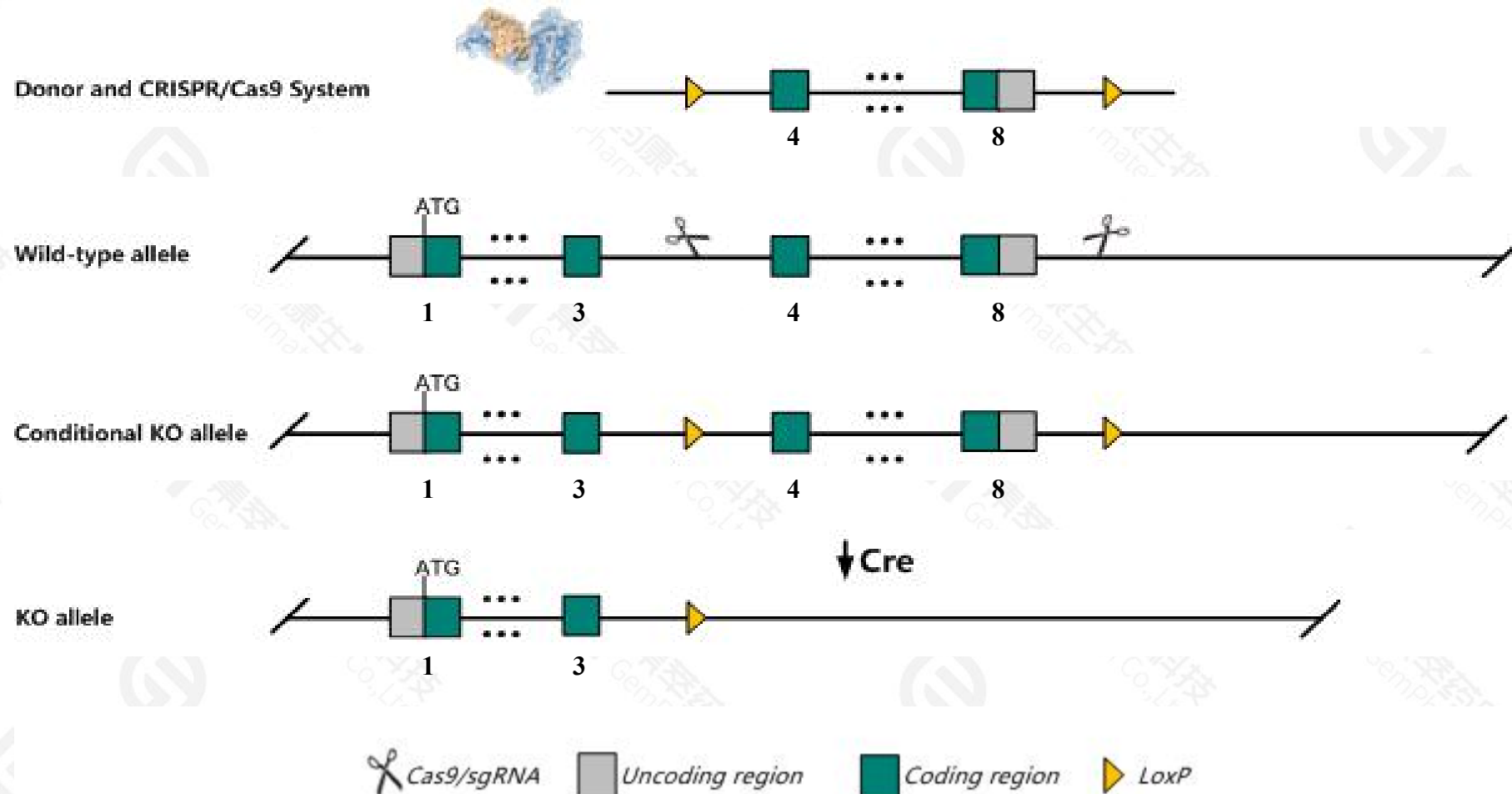
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Naa10* gene. The schematic diagram is as follows:



Technical routes

- The *Naa10* gene has 12 transcripts. According to the structure of *Naa10* gene, exon4-exon8 of *Naa10-201*(ENSMUST00000033763.15) transcript is recommended as the knockout region. The region contains most of coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Naa10* 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, male homozygous mice with *Naa10* gene knocked out showed abnormal seminal vesicle morphology, enlarged seminal vesicle, small seminal vesicle, abnormal testis morphology.
- The KO region contains functional region of the *Arhgap4-209* gene. Knockout the region may affect the function of *Arhgap4* gene.
- The *Naa10* gene is located on the ChrX. 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)

Naa10 N(alpha)-acetyltransferase 10, NatA catalytic subunit [*Mus musculus* (house mouse)]

[Download Datasets](#)

Gene ID: 56292, updated on 6-May-2021

Summary

Official Symbol	Naa10 provided by MGI
Official Full Name	N(alpha)-acetyltransferase 10, NatA catalytic subunit provided by MGI
Primary source	MGI:MGI:1915255
See related	Ensembl:ENSMUSG00000031388
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	Ar; Te2; Ard1; Ard1a; 2310039H09Rik
Expression	Ubiquitous expression in liver E14.5 (RPKM 30.5), large intestine adult (RPKM 29.1) and 27 other tissues See more
Orthologs	human all

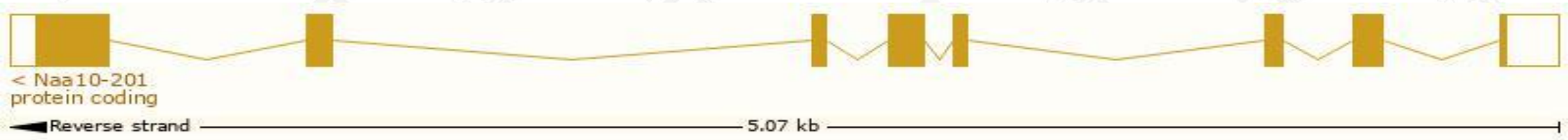


Transcript information (Ensembl)

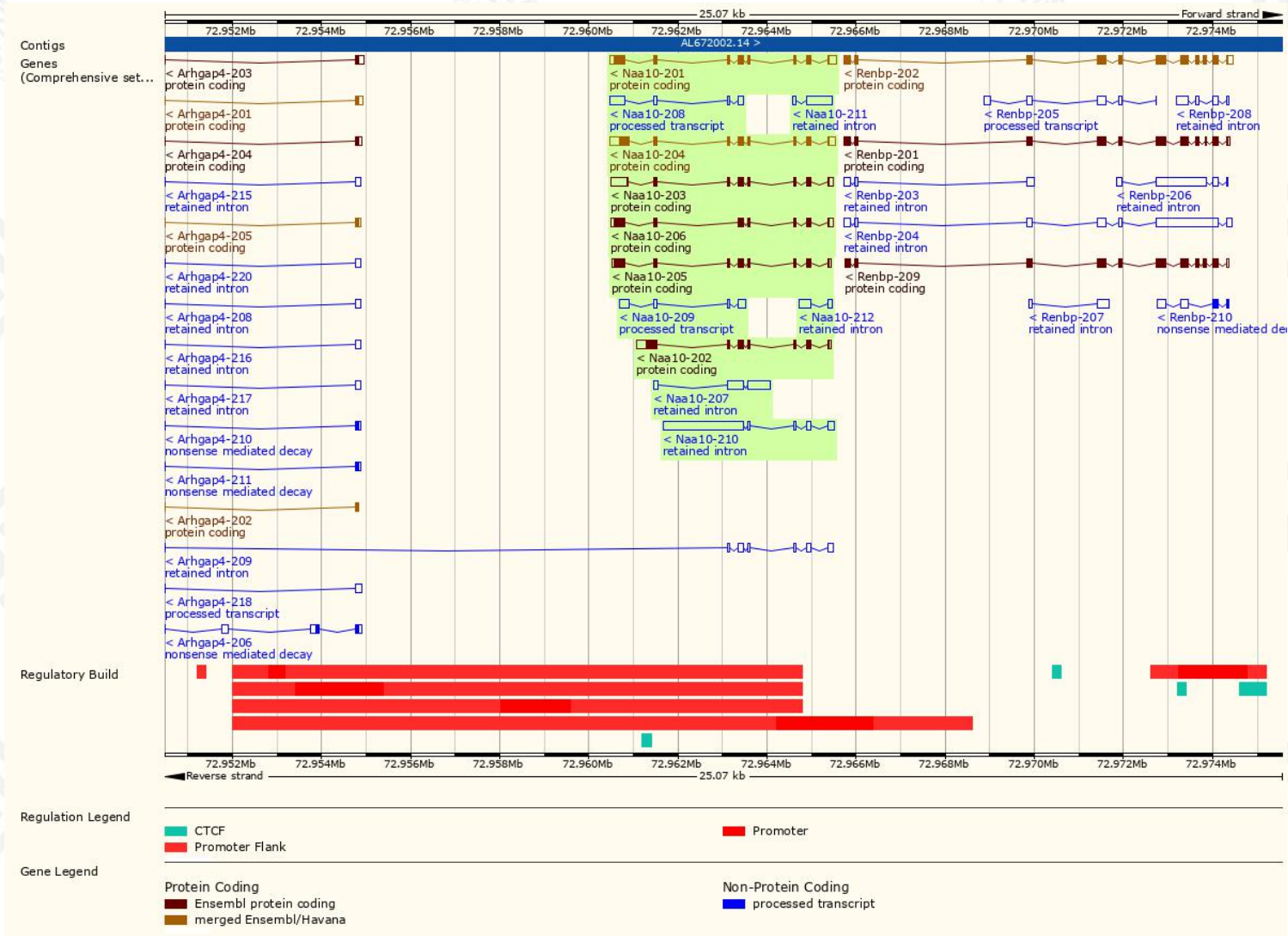
The gene has 12 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Naa10-204	ENSMUST00000114389.10	1031	225aa	Protein coding	CCDS53102		TSL:1 , GENCODE basic , APPRIS ALT2 ,
Naa10-203	ENSMUST00000114387.8	979	170aa	Protein coding	CCDS81139		TSL:2 , GENCODE basic , APPRIS ALT2 ,
Naa10-201	ENSMUST00000033763.15	962	235aa	Protein coding	CCDS30217		TSL:1 , GENCODE basic , APPRIS P3 ,
Naa10-202	ENSMUST00000096316.4	892	206aa	Protein coding	-		TSL:2 , GENCODE basic , APPRIS ALT2 ,
Naa10-206	ENSMUST00000114391.10	834	220aa	Protein coding	-		TSL:5 , GENCODE basic ,
Naa10-205	ENSMUST00000114390.8	797	233aa	Protein coding	-		TSL:5 , GENCODE basic ,
Naa10-208	ENSMUST00000139105.8	551	No protein	Processed transcript	-		TSL:5 ,
Naa10-209	ENSMUST00000141211.2	479	No protein	Processed transcript	-		TSL:2 ,
Naa10-210	ENSMUST00000143076.2	2156	No protein	Retained intron	-		TSL:1 ,
Naa10-207	ENSMUST00000124446.2	963	No protein	Retained intron	-		TSL:5 ,
Naa10-211	ENSMUST00000149591.2	649	No protein	Retained intron	-		TSL:2 ,
Naa10-212	ENSMUST00000153929.2	355	No protein	Retained intron	-		TSL:2 ,

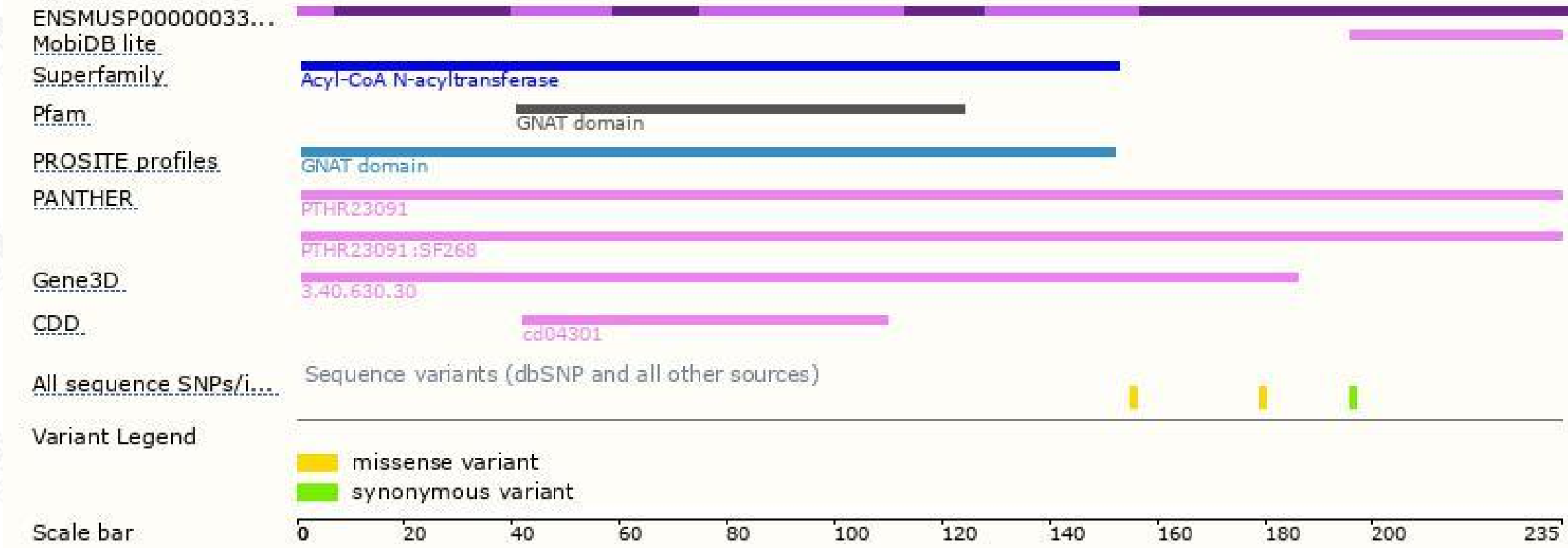
The strategy is based on the design of *Naa10-201* transcript,the transcription is shown below:



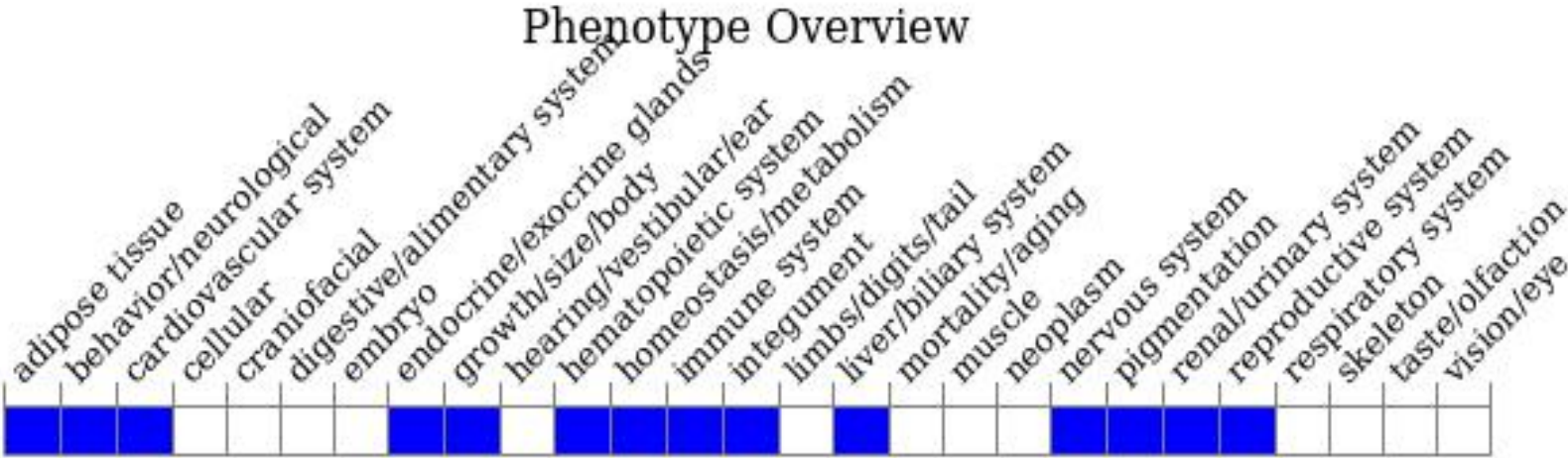
Genomic location distribution



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/>).

Mouse Phenotypes

Availability	Mouse Genotype	abnormal seminal vesicle morpho
Find Mice	Naa10 ^{em1(IMPC)} Mbp ^γ	enlarged seminal vesicle
		small seminal vesicle
		abnormal testis morphology
		small testis

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

Tel: 025-5864 1534

