Foxf2 Cas9-KO Strategy

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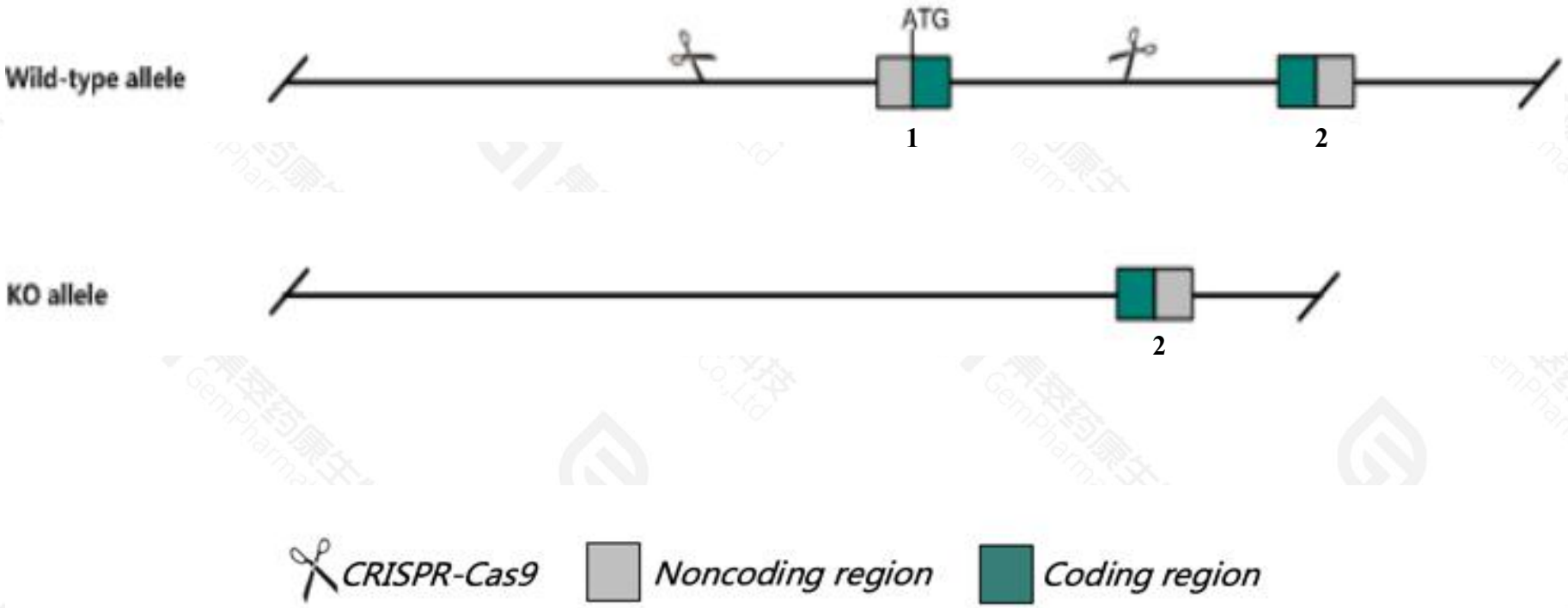
Design Date: 2022-07-11

Project Overview

Project Name	***Foxf2***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR-Cas9 technology to edit the *Foxf2* gene. The schematic diagram is as follows:



Technical routes

➢ The *Foxf2* gene has 1 transcript. According to the structure of *Foxf2* gene, exon1 of *Foxf2-201*(ENSMUST00000042054.3) transcript is recommended as the knockout region.The region contains start codon ATG.Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR-Cas9 technology to modify *Foxf2* gene. The brief process is as follows: CRISPR-Cas9 system 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.

Notice

➢ According to the existing MGI data,homozygous mutant mice do not live through the first day of life due to an inability to suckle, which is secondary to cleft palate and tongue abnormalities. Mice homozygous for an ENU mutation exhibit postnatal lethality without palate defect and abnormal anterior segment dysgenesis.

➢ *1700018A04Rik* and ENSMUST00020183033.1 will be knockout.

➢ The *Foxf2* gene is located on the Chr13. 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 the gene knockout on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

Gene information （NCBI）

集萃药康 GemPharmatech

Foxf2 forkhead box F2 [Mus musculus (house mouse)]

Gene ID: 14238, updated on 13-Mar-2020

Summary

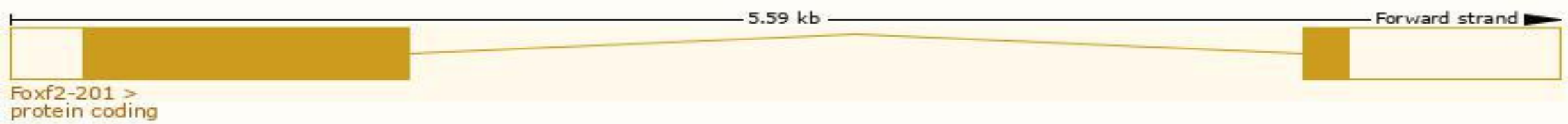
Official Symbol	Foxf2 provided by MGI
Official Full Name	forkhead box F2 provided byMGI
Primary source	MGI:MGI:1347479
See related	Ensembl:ENSMUSG00000038402
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	FREAC2, Fkh20, LUN
Expression	Biased expression in lung adult (RPKM 29.7), stomach adult (RPKM 20.5) and 12 other tissuesSee more
Orthologs	human all

Transcript information（Ensembl）

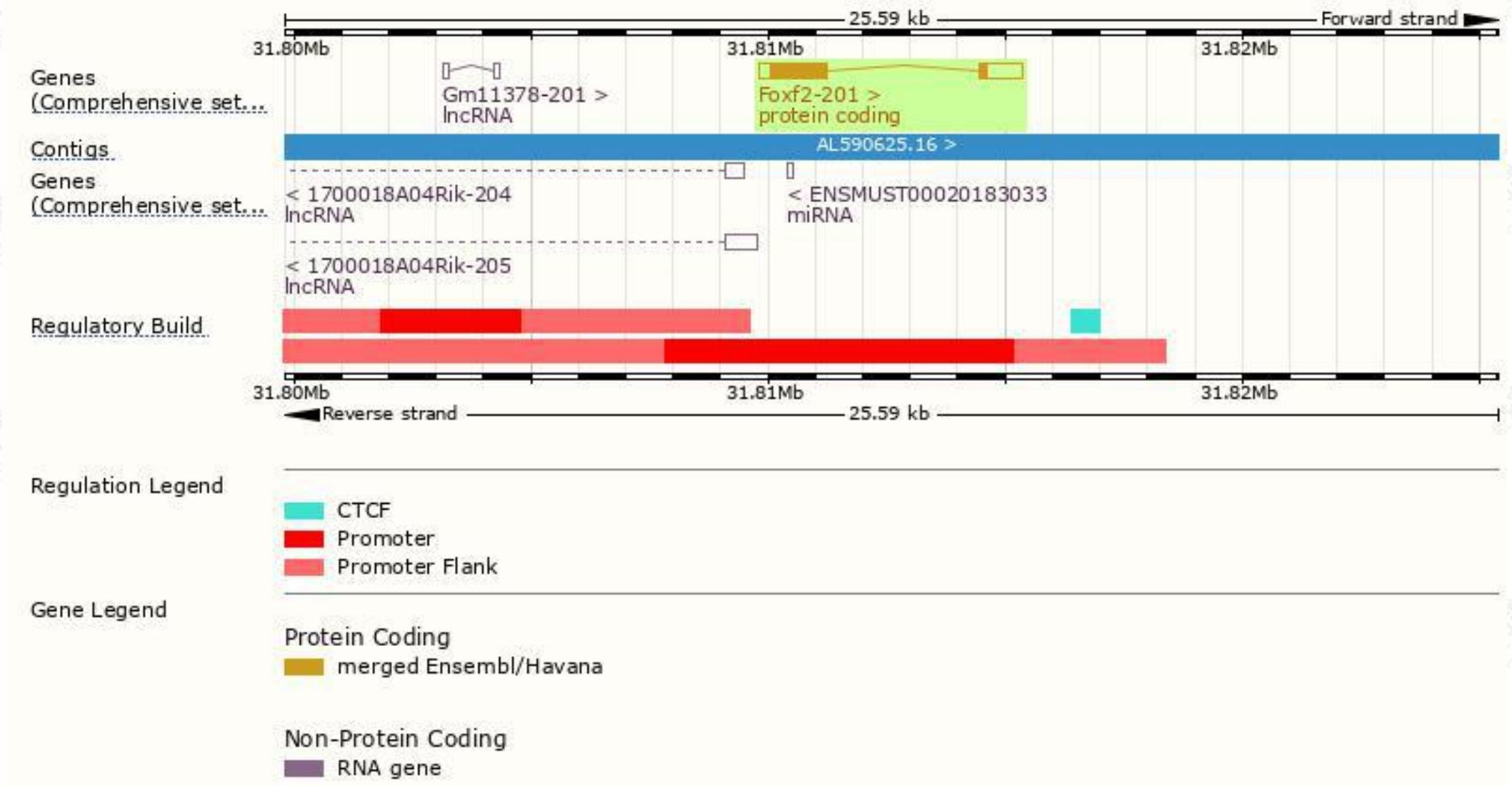
The gene has 1 transcript,and the transcript is shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Foxf2-201	ENSMUST00000042054.2	2363	446aa	Protein coding	CCDS26424	O54743	TSL:1 GENCODE basic APPRIS is a system to annotate alternatively spliced transcripts based on a range of computational methods to identify the most functionally important transcript(s) of a gene. APPRIS P1

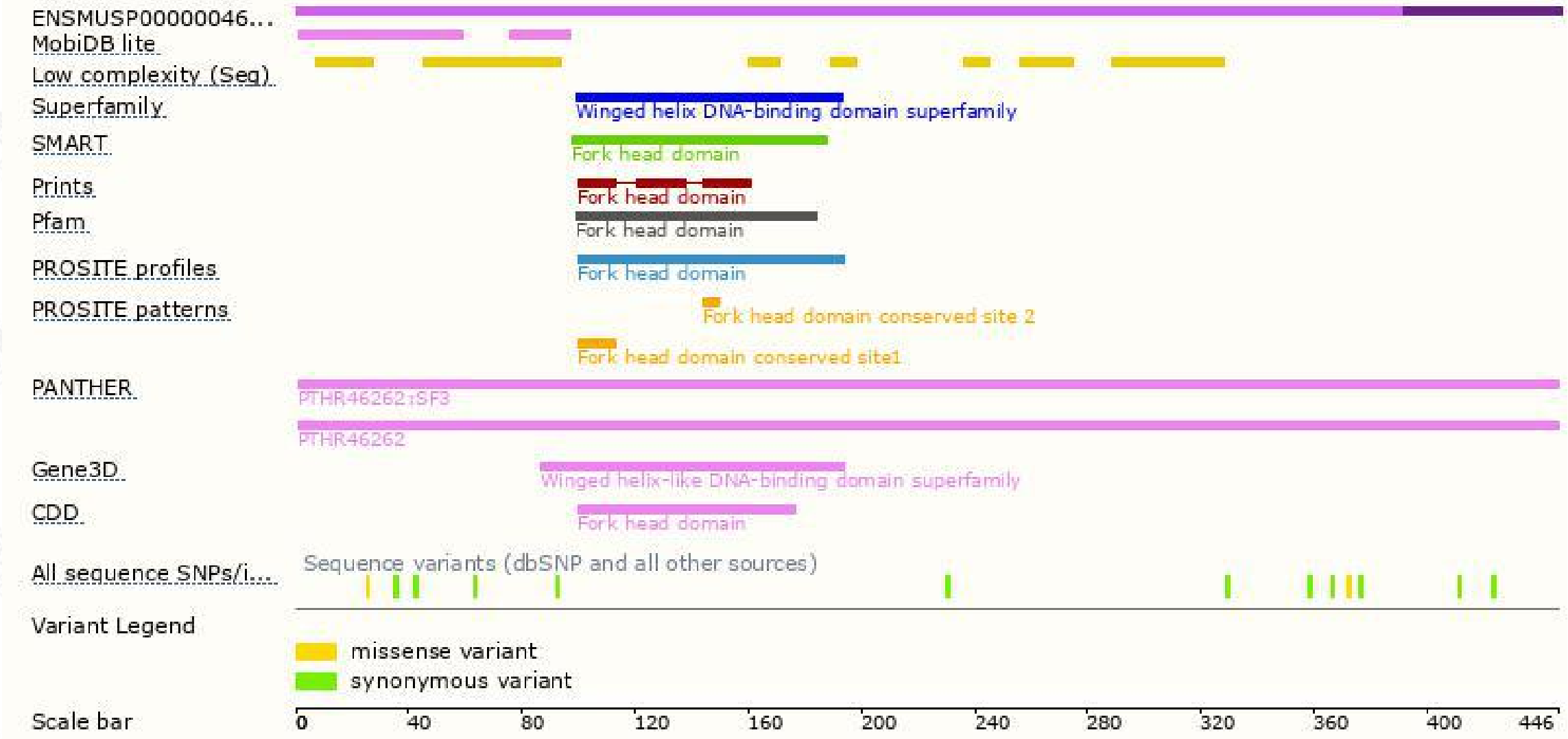
The strategy is based on the design of *Foxf2-201* transcript,the transcription is shown below:



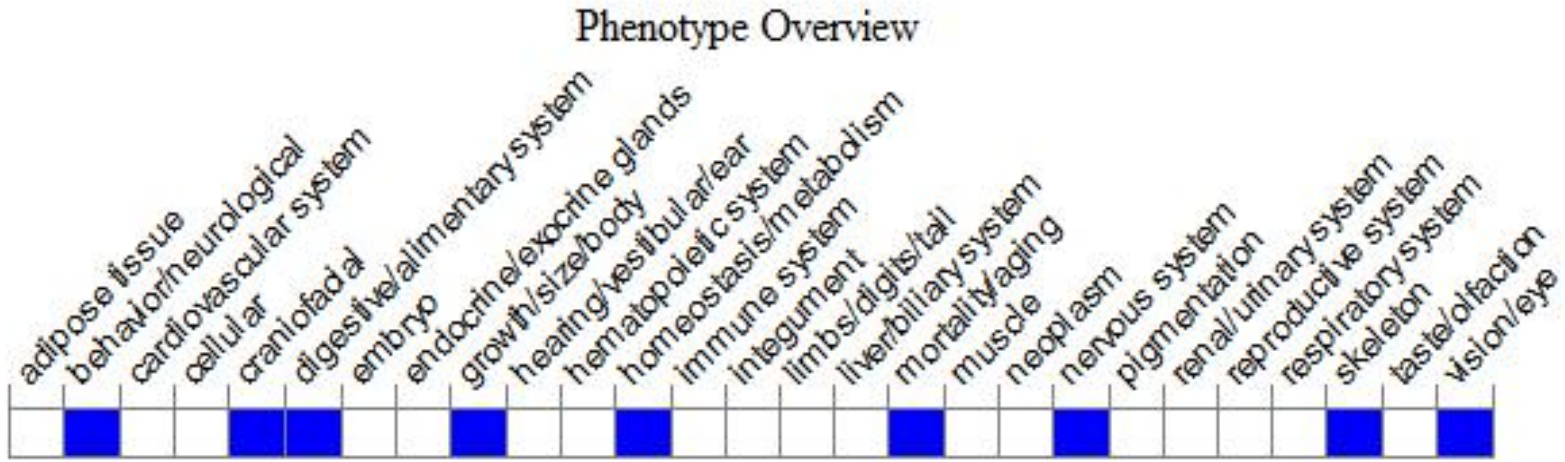
Genomic location distribution



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 mutant mice do not live through the first day of life due to an inability to suckle, which is secondary to cleft palate and tongue abnormalities. Mice homozygous for an ENU mutation exhibit postnatal lethality without palate defect and abnormal anterior segment dysgenesis.

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