

Degs1 Cas9-CKO Strategy

Designer:

Huan Wang

Reviewer:

Huan Fan

Design Date:

2020-4-22

Project Overview

Project Name

Degs1

Project type

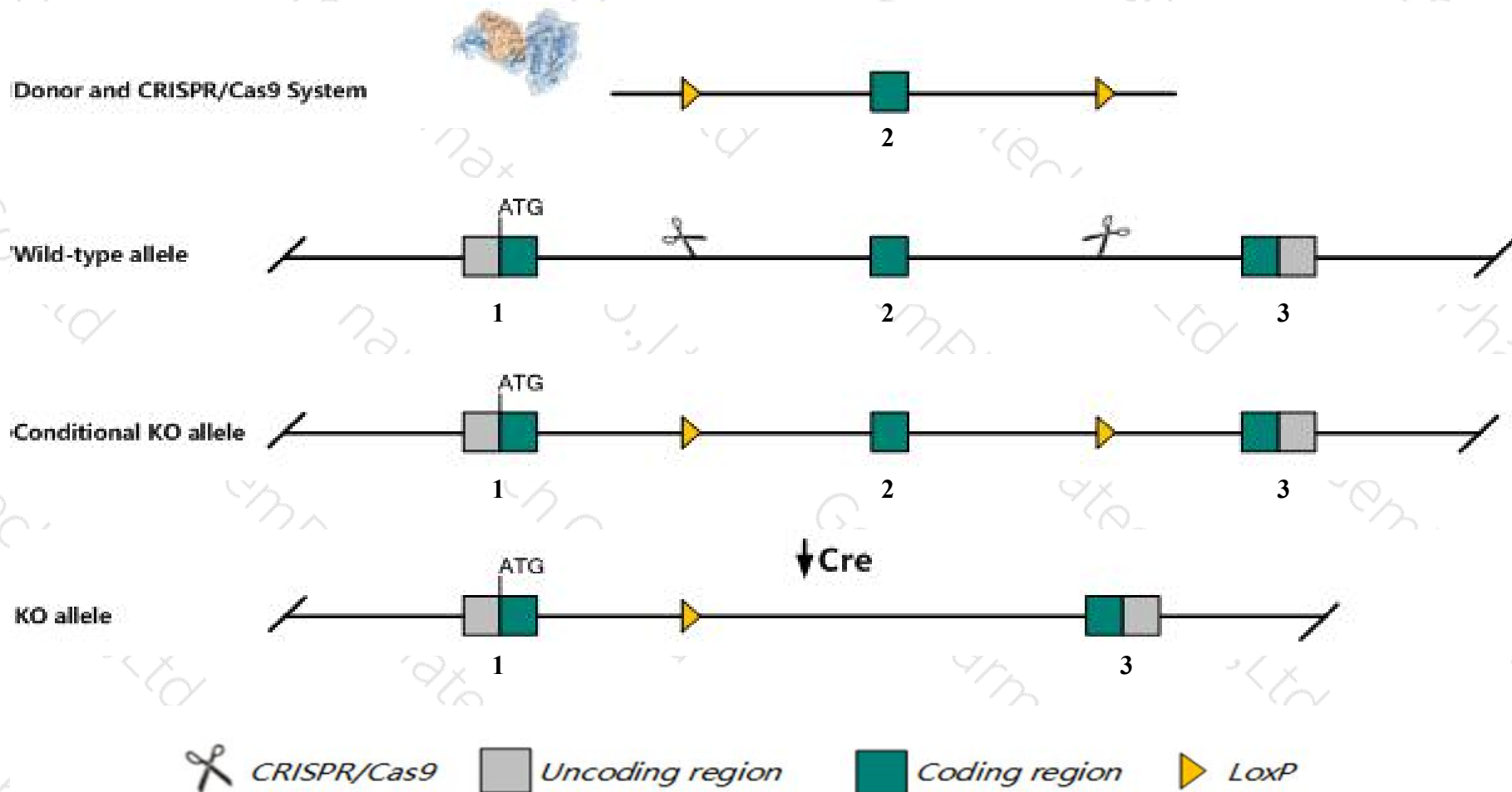
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Degs1* gene. The schematic diagram is as follows:



Technical routes

- The *Degs1* gene has 3 transcripts. According to the structure of *Degs1* gene, exon2 of *Degs1-201* (ENSMUST00000035295.5) transcript is recommended as the knockout region. The region contains 743bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Degs1* 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.

- According to the existing MGI data, mice homozygous for a knock-out allele exhibit premature death, decreased to absent ceramide levels, decreased body weight, scaly skin, sparse hair, tremors, hematological and blood chemistry abnormalities, decreased bone mineral content and density and decreased liver function.
- The *Degs1* 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)

Degs1 delta(4)-desaturase, sphingolipid 1 [Mus musculus (house mouse)]

Gene ID: 13244, updated on 13-Mar-2020

Summary



Official Symbol Degs1 provided by [MGI](#)

Official Full Name delta(4)-desaturase, sphingolipid 1 provided by [MGI](#)

Primary source [MGI:MGI:1097711](#)

See related [Ensembl:ENSMUSG00000038633](#)

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 AA536663, Degs, Des1, Mdes

Expression Ubiquitous expression in placenta adult (RPKM 57.5), kidney adult (RPKM 52.3) and 28 other tissues [See more](#)

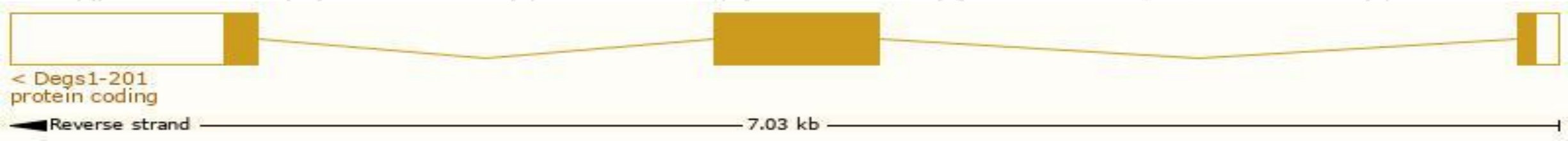
Orthologs [human](#) [all](#)

Transcript information (Ensembl)

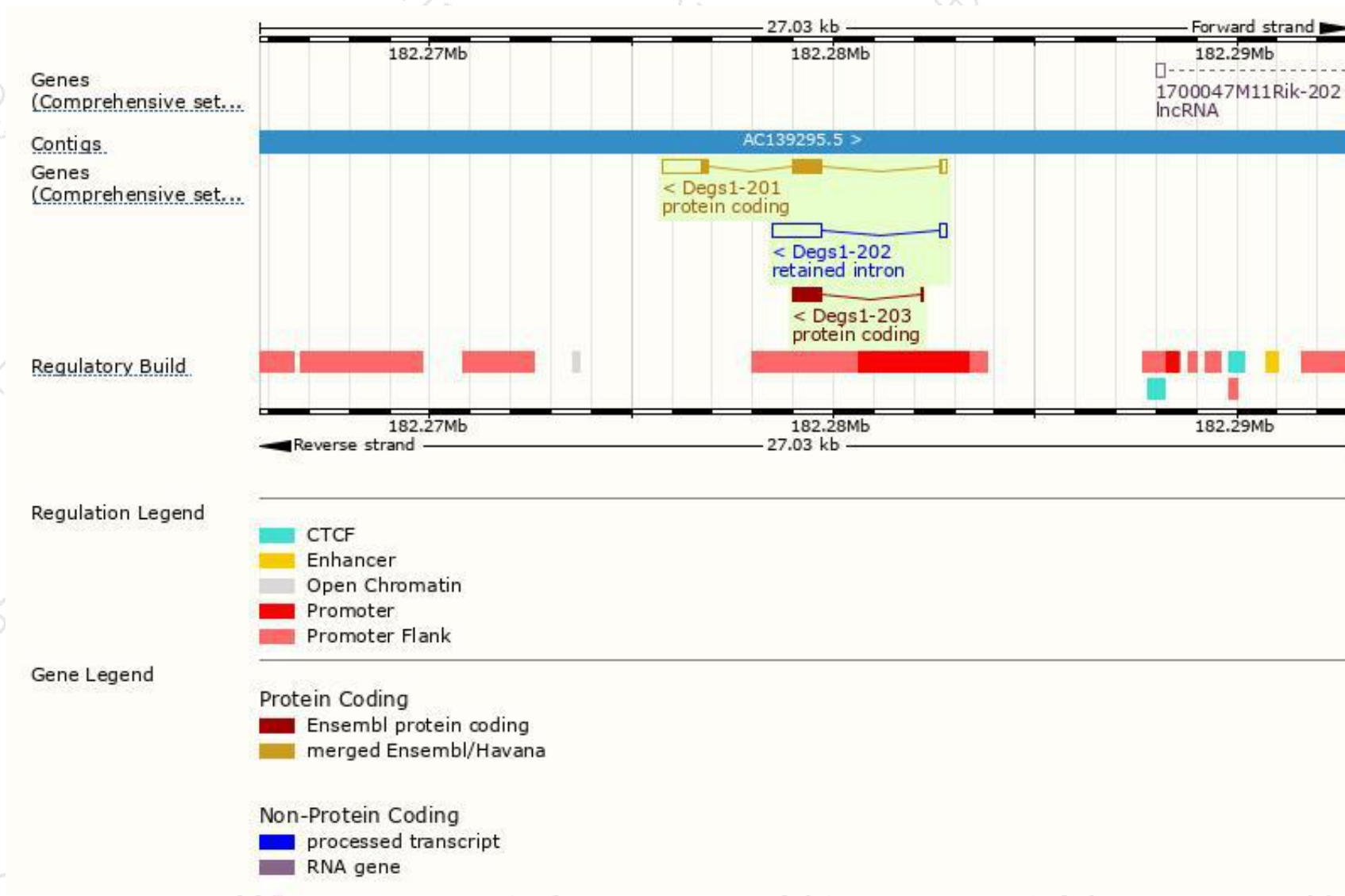
The gene has 3 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Degs1-201	ENSMUST00000035295.5	2048	323aa	Protein coding	CCDS15587	O09005	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
Degs1-203	ENSMUST00000133052.1	779	229aa	Protein coding	-	F6S3U4	CDS 3' incomplete TSL:2
Degs1-202	ENSMUST00000132551.1	1405	No protein	Retained intron	-	-	TSL:1

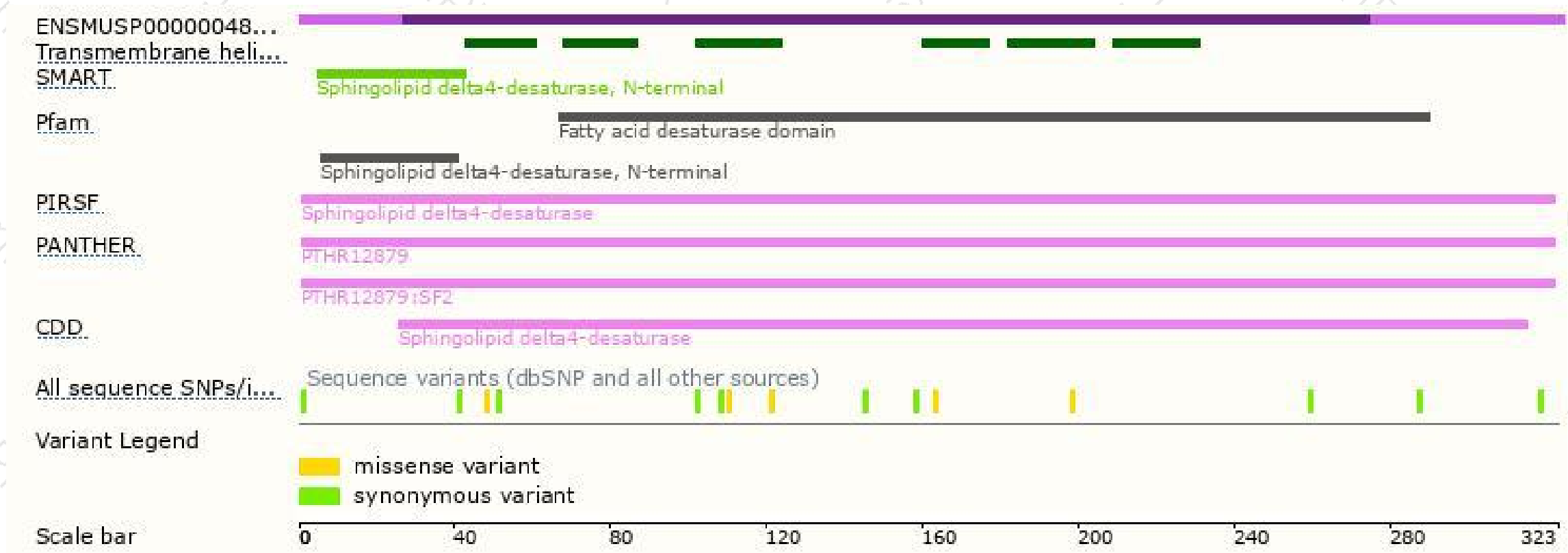
The strategy is based on the design of *Degs1-201* transcript,the transcription is shown below:



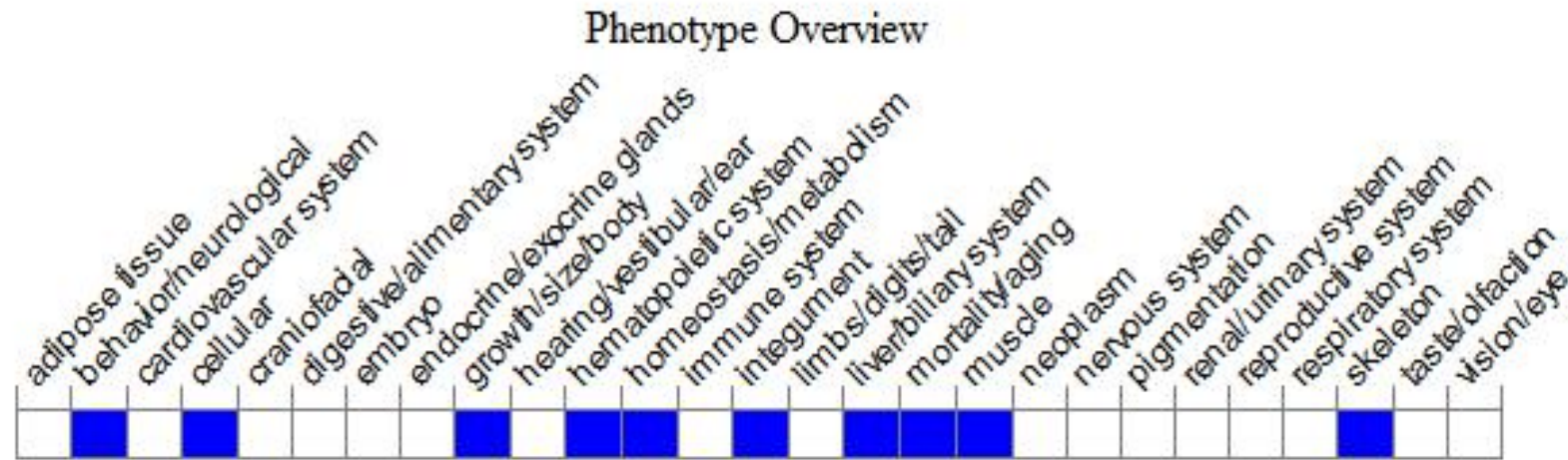
Genomic location distribution



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 a knock-out allele exhibit premature death, decreased to absent ceramide levels, decreased body weight, scaly skin, sparse hair, tremors, hematological and blood chemistry abnormalities, decreased bone mineral content and density and decreased liver function.

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

Tel: 400-9660890

