

Zfx3 Cas9-KO Strategy

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Project Overview

Project Name

Zfhx3

Project type

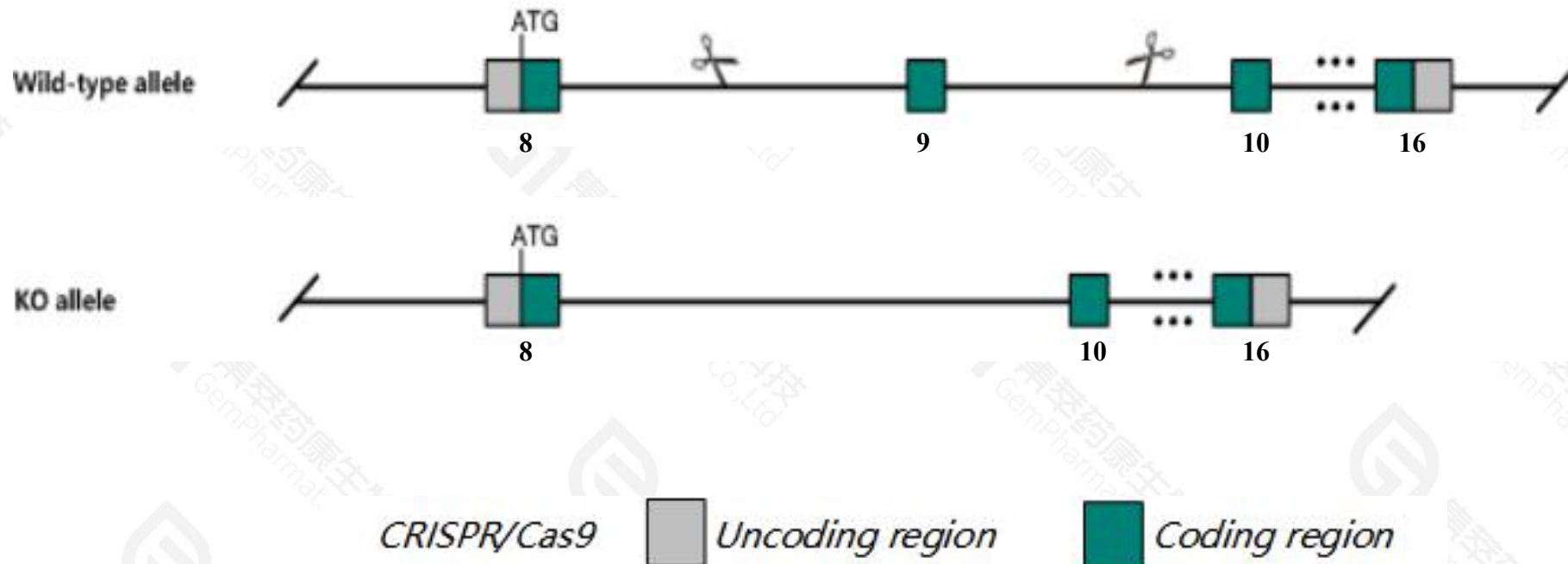
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Zfx3* gene. The schematic diagram is as follows:



- The *Zfhx3* gene has 7 transcripts. According to the structure of *Zfhx3* gene, exon9 of *Zfhx3-204*(ENSMUST00000220518.2) transcript is recommended as the knockout region. The region contains 497bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Zfhx3* 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.

- According to the existing MGI data, mice homozygous for a gene trapped allele exhibit normal initial pituitary development but reduced GH and TSH-beta staining within the pituitary by E17.5. Mice homozygous for a knock-out allele exhibit prenatal lethality. Mice heterozygous for the same allele exhibit partial postnatal lethality, decreased body size and prolonged conception time.
- The *Zfhx3* gene is located on the Chr8. 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.

Zfhx3 zinc finger homeobox 3 [Mus musculus (house mouse)]

Gene ID: 11906, updated on 17-Dec-2020

Summary



Official Symbol	Zfhx3 provided by MGI
Official Full Name	zinc finger homeobox 3 provided by MGI
Primary source	MGI:MGI:99948
See related	Ensembl:ENSMUSG00000038872
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	A230102L03Rik, Atbf, Atbf1, S, Sci, WBP, WBP9, mKIAA4228
Expression	Broad expression in whole brain E14.5 (RPKM 5.6), adrenal adult (RPKM 5.4) and 24 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

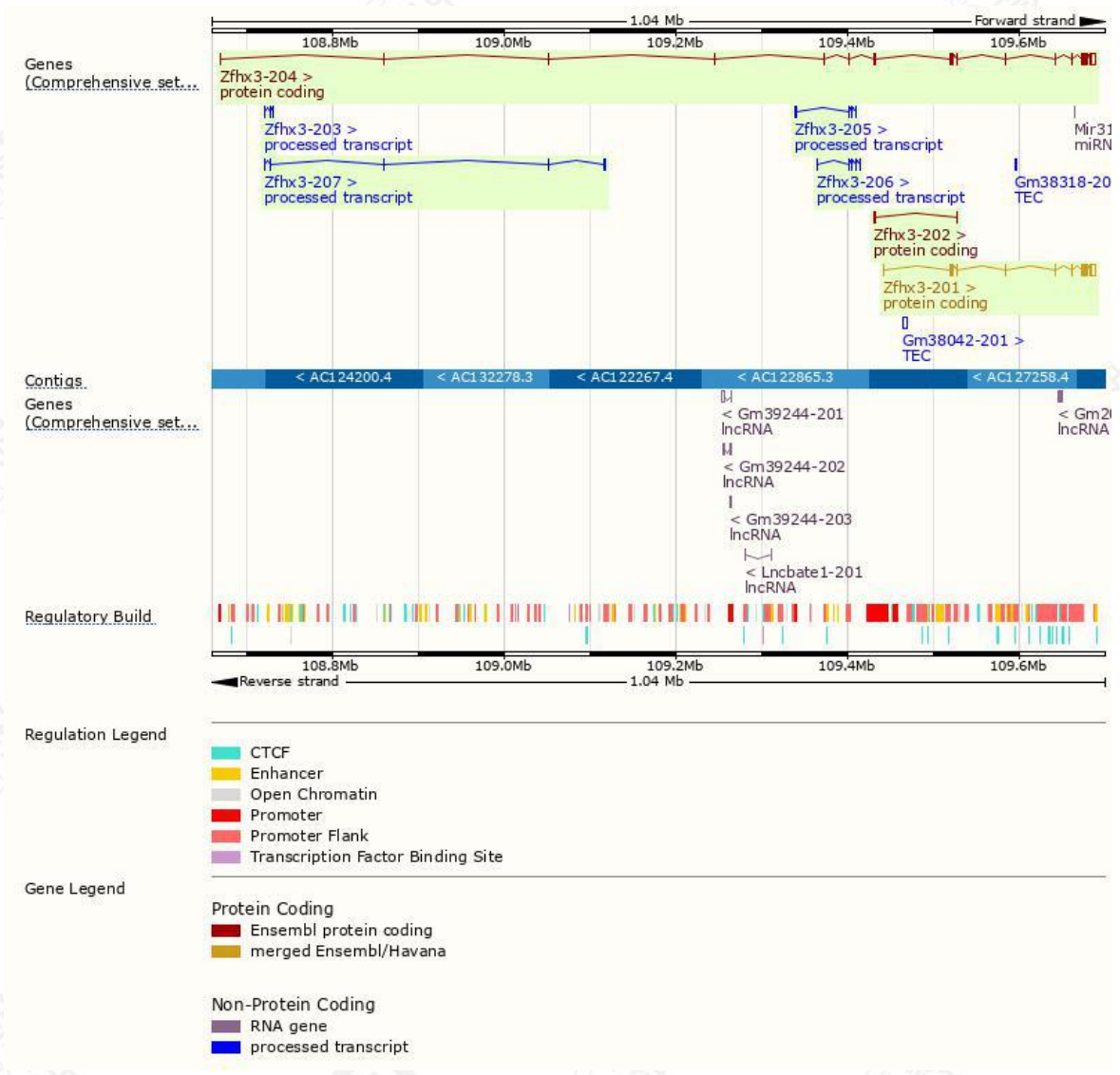
The gene has 7 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Zfhx3-204	ENSMUST00000220518.2	17152	3723aa	Protein coding	CCDS22651		TSL:5 , GENCODE basic , APPRIS P1 ,
Zfhx3-201	ENSMUST00000043896.10	16433	3723aa	Protein coding	CCDS22651		TSL:1 , GENCODE basic , APPRIS P1 ,
Zfhx3-202	ENSMUST00000188994.2	1212	17aa	Protein coding	-		CDS 3' incomplete , TSL:5 ,
Zfhx3-207	ENSMUST00000221632.2	1296	No protein	Processed transcript	-		TSL:5 ,
Zfhx3-205	ENSMUST00000221100.2	1011	No protein	Processed transcript	-		TSL:5 ,
Zfhx3-203	ENSMUST00000212094.2	834	No protein	Processed transcript	-		TSL:5 ,
Zfhx3-206	ENSMUST00000221237.2	817	No protein	Processed transcript	-		TSL:5 ,

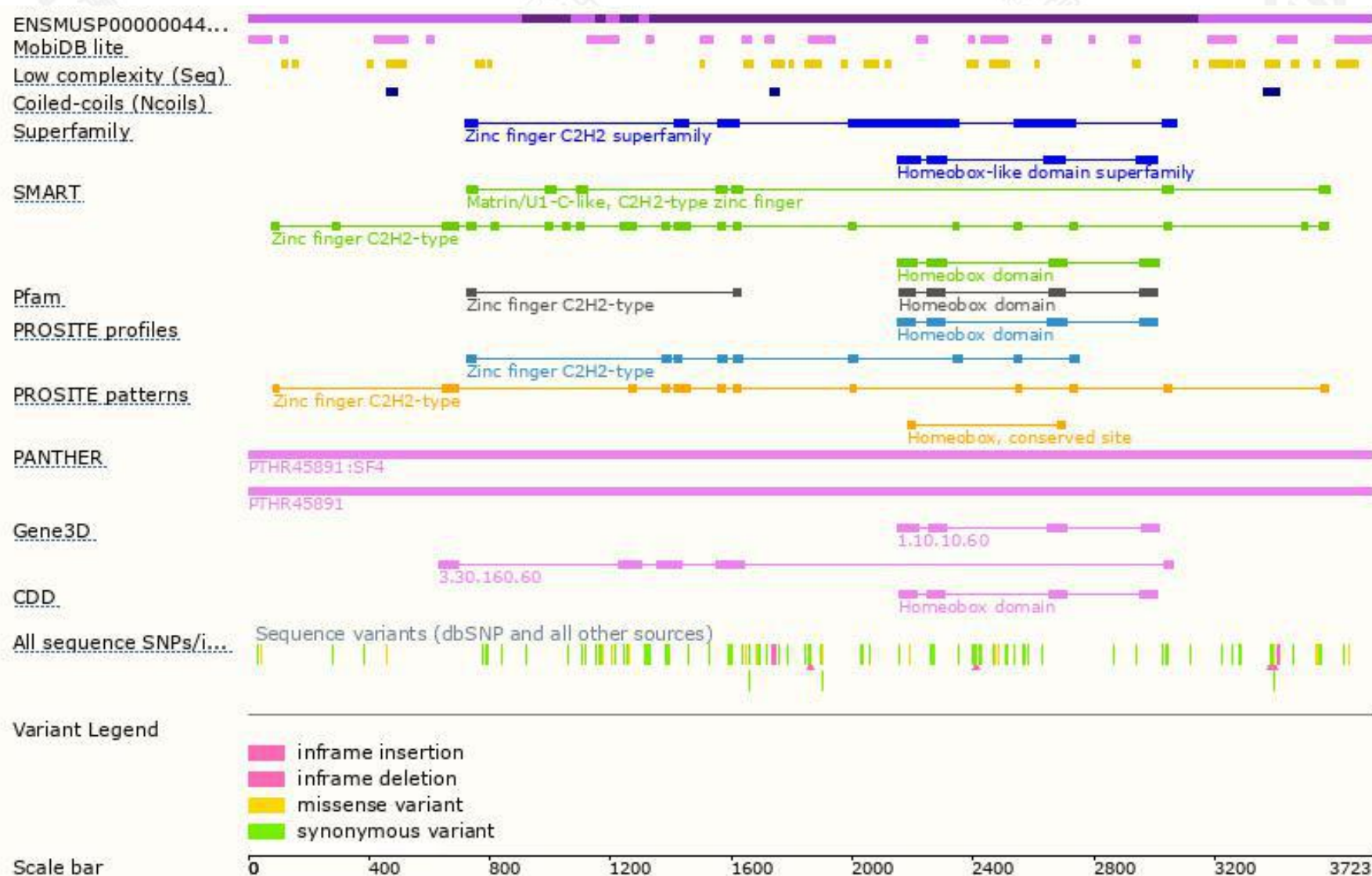
The strategy is based on the design of *Zfhx3-204* transcript,the transcription is shown below:



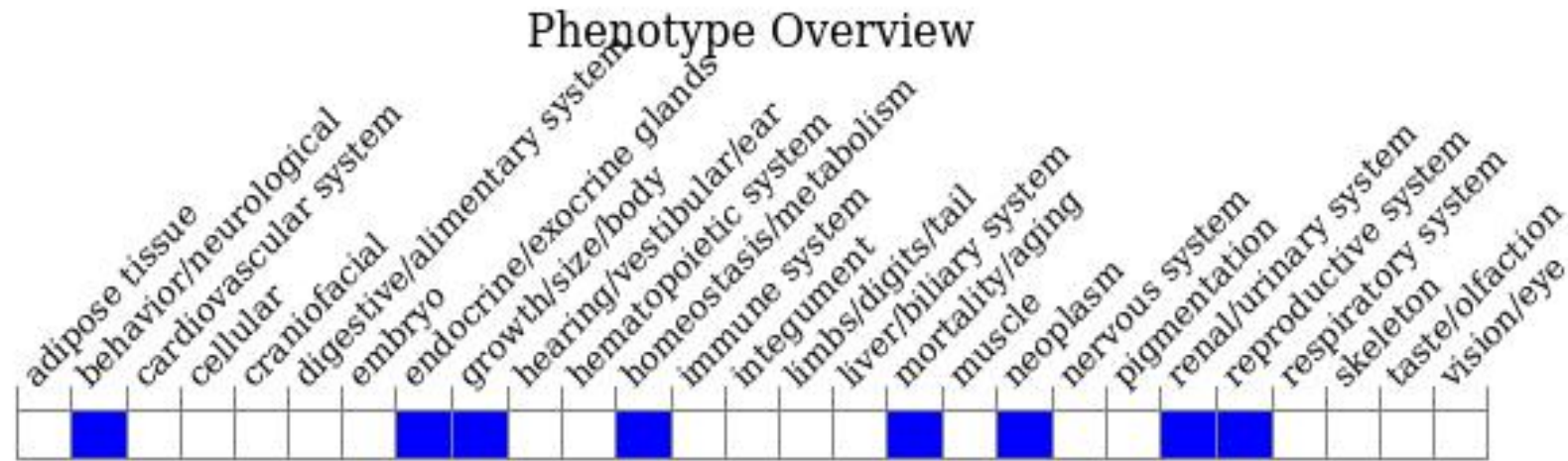
Genomic location distribution



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 gene trapped allele exhibit normal initial pituitary development but reduced GH and TSH-beta staining within the pituitary by E17.5. Mice homozygous for a knock-out allele exhibit prenatal lethality. Mice heterozygous for the same allele exhibit partial postnatal lethality, decreased body size and prolonged conception time.

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

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