

Fbxo2 Cas9-CKO Strategy

Designer: Longyun Hu

Reviewer: Yun Li

Design Date: 2020/8/17

Project Overview

Project Name

Fbxo2

Project type

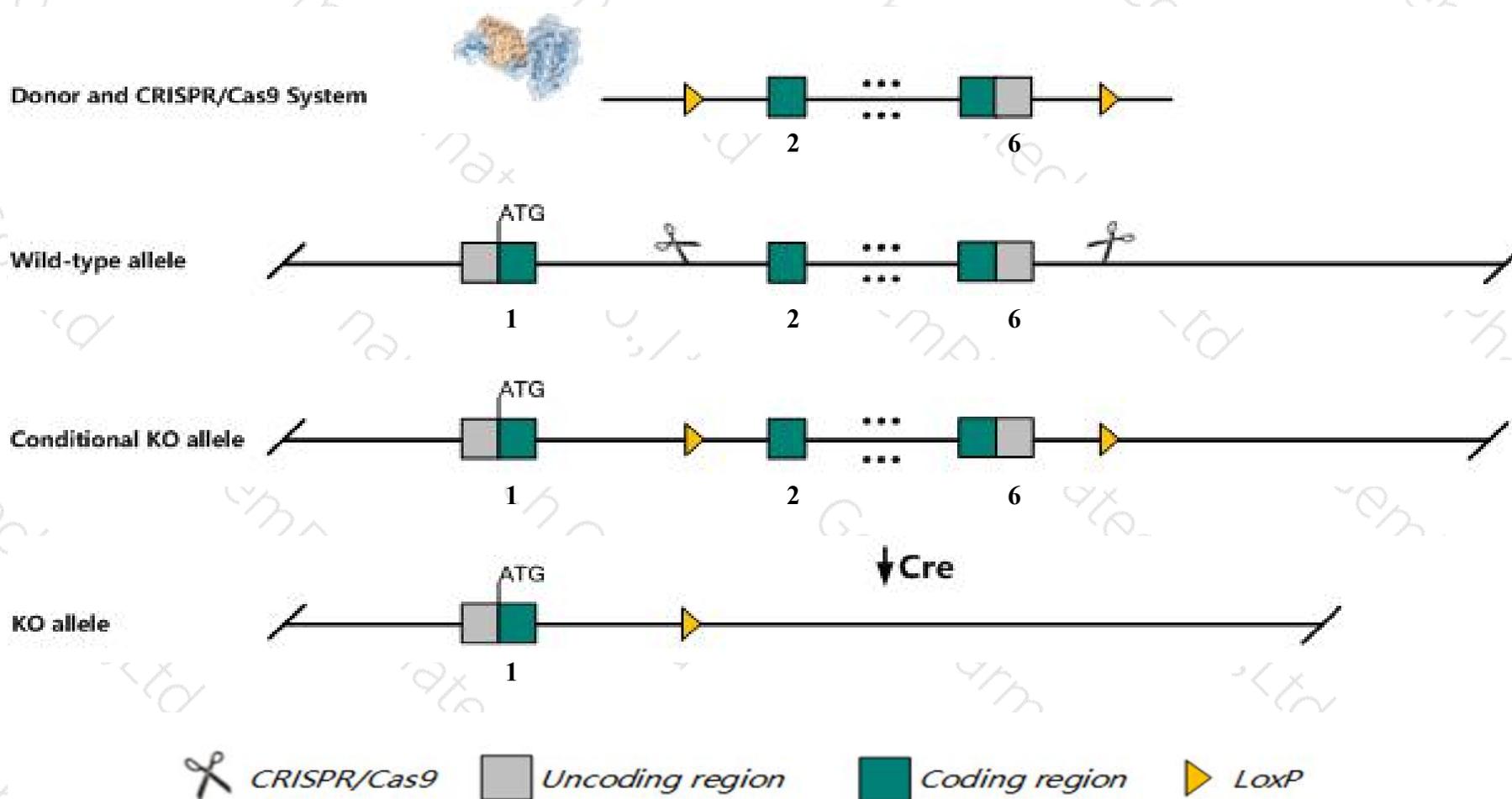
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Fbxo2* gene. The schematic diagram is as follows:



Technical routes

- The *Fbxo2* gene has 1 transcript. According to the structure of *Fbxo2* gene, exon2-exon6 of *Fbxo2-201*(ENSMUST00000047951.8) transcript is recommended as the knockout region. The region contains 872bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Fbxo2* 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, homozygotes for a targeted mutation are behaviorally normal but display accelerated, age-related hearing loss associated with cochlear degeneration. Cellular degeneration begins at 2 months in the supporting cells of the organ of Corti and progresses to cochlear hair cells and the spiral ganglion.
- The *Fbxo2* gene is located on the Chr4. 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.
- The KO region contains functional region of the *Fbxo44* gene. Knockout the region may affect the function of *Fbxo44* gene.
- 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)

Fbxo2 F-box protein 2 [Mus musculus (house mouse)]

Gene ID: 230904, updated on 13-Mar-2020

Summary



Official Symbol	Fbxo2 provided by MGI
Official Full Name	F-box protein 2 provided by MGI
Primary source	MGI:MGI:2446216
See related	Ensembl:ENSMUSG00000041556
Gene type	protein coding
RefSeq status	PROVISIONAL
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	FBG1, FBX2, Fbs1, Fbs2, NFB42, Prpl4
Expression	Biased expression in cerebellum adult (RPKM 35.4), cortex adult (RPKM 30.5) and 4 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

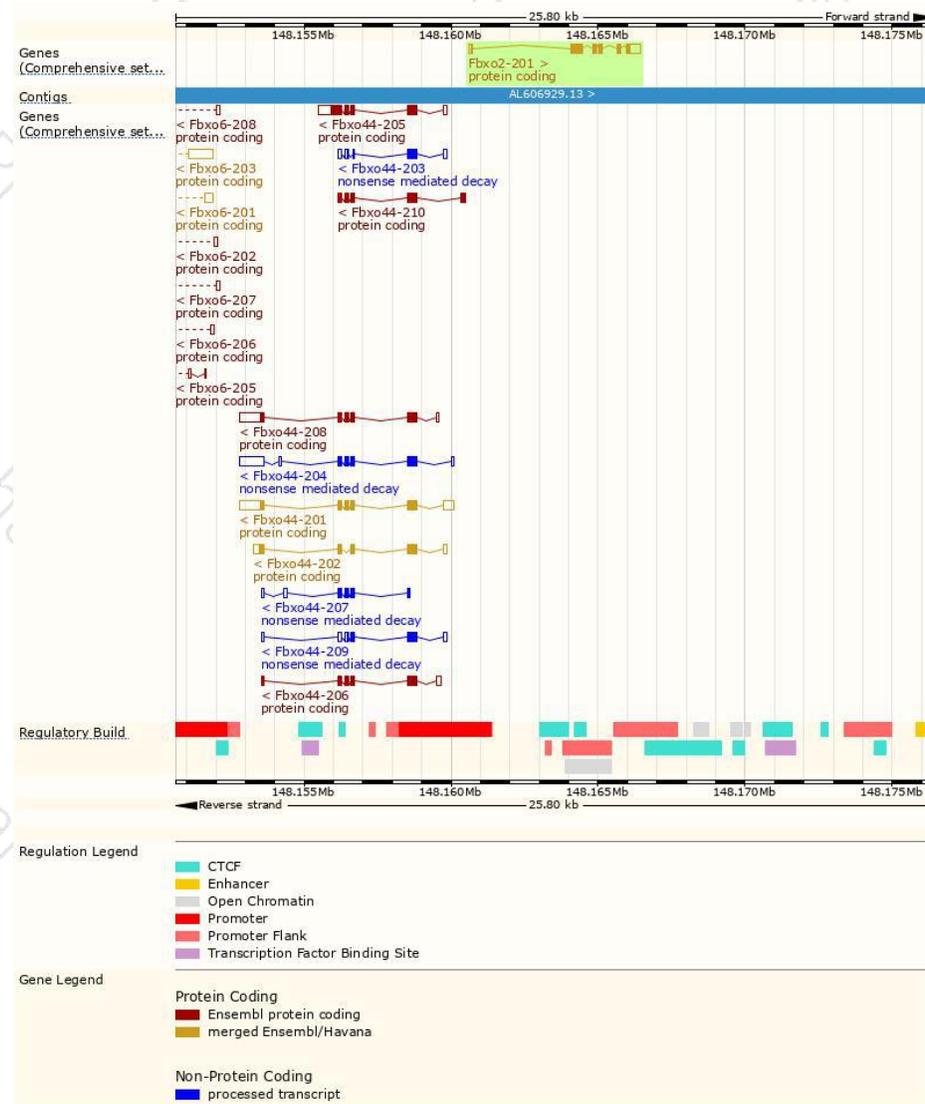
The gene has 1 transcript, and the transcript is shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Fbxo2-201	ENSMUST00000047951.8	1288	297aa	Protein coding	CCDS18935	Q3USR5 Q80UW2	TSL:1 GENCODE basic APPRIS P1

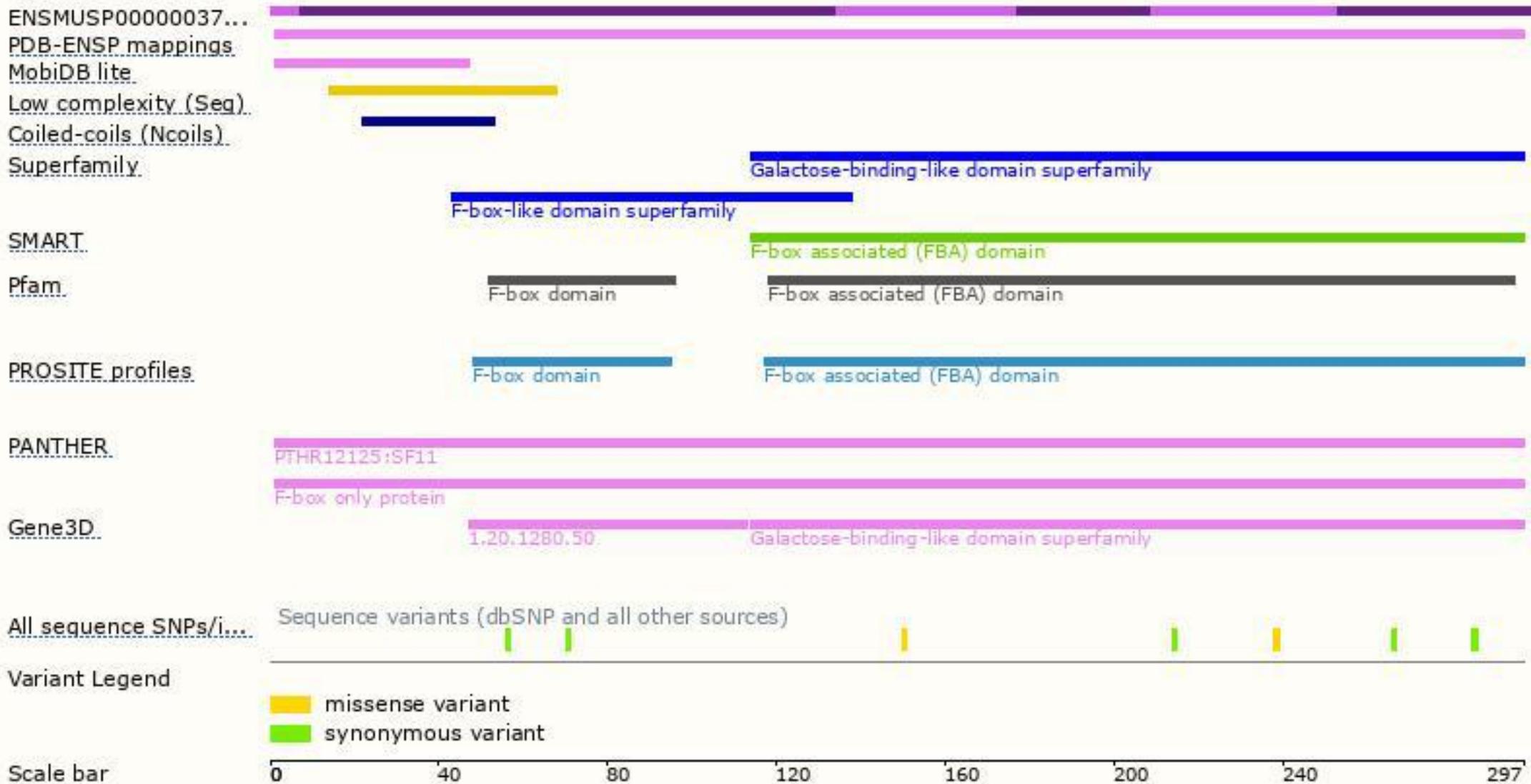
The strategy is based on the design of *Fbxo2-201* transcript, the transcription is shown below:



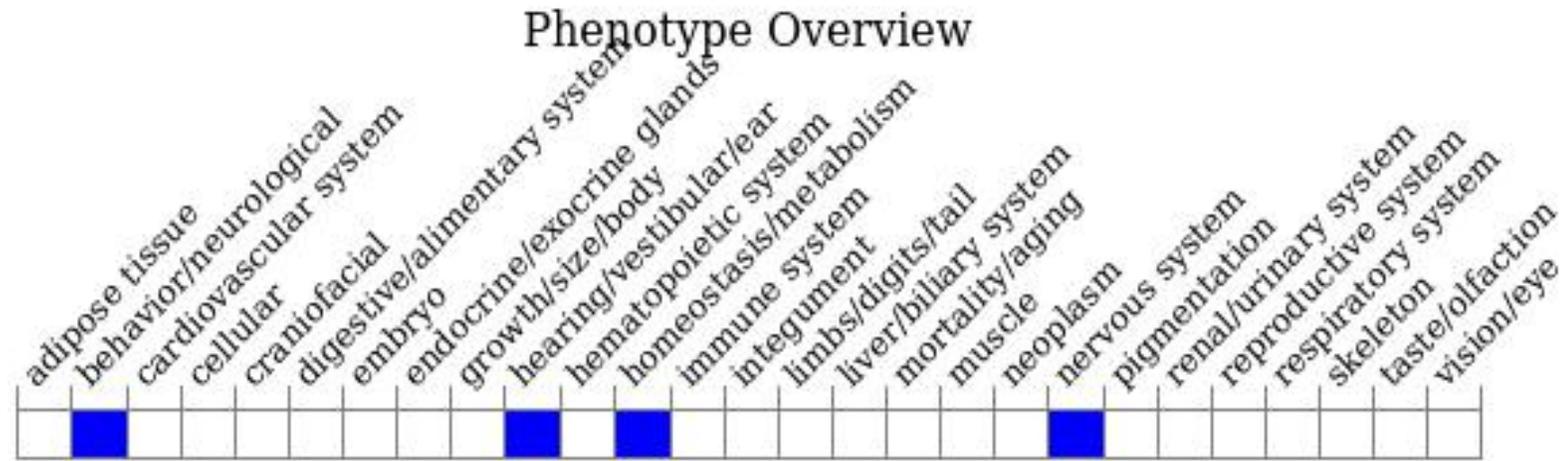
Genomic location distribution



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, homozygotes for a targeted mutation are behaviorally normal but display accelerated, age-related hearing loss associated with cochlear degeneration. Cellular degeneration begins at 2 months in the supporting cells of the organ of Corti and progresses to cochlear hair cells and the spiral ganglion.

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

Tel: 400-9660890

