

Gsx2 Cas9-CKO Strategy

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Project Overview

Project Name

Gsx2

Project type

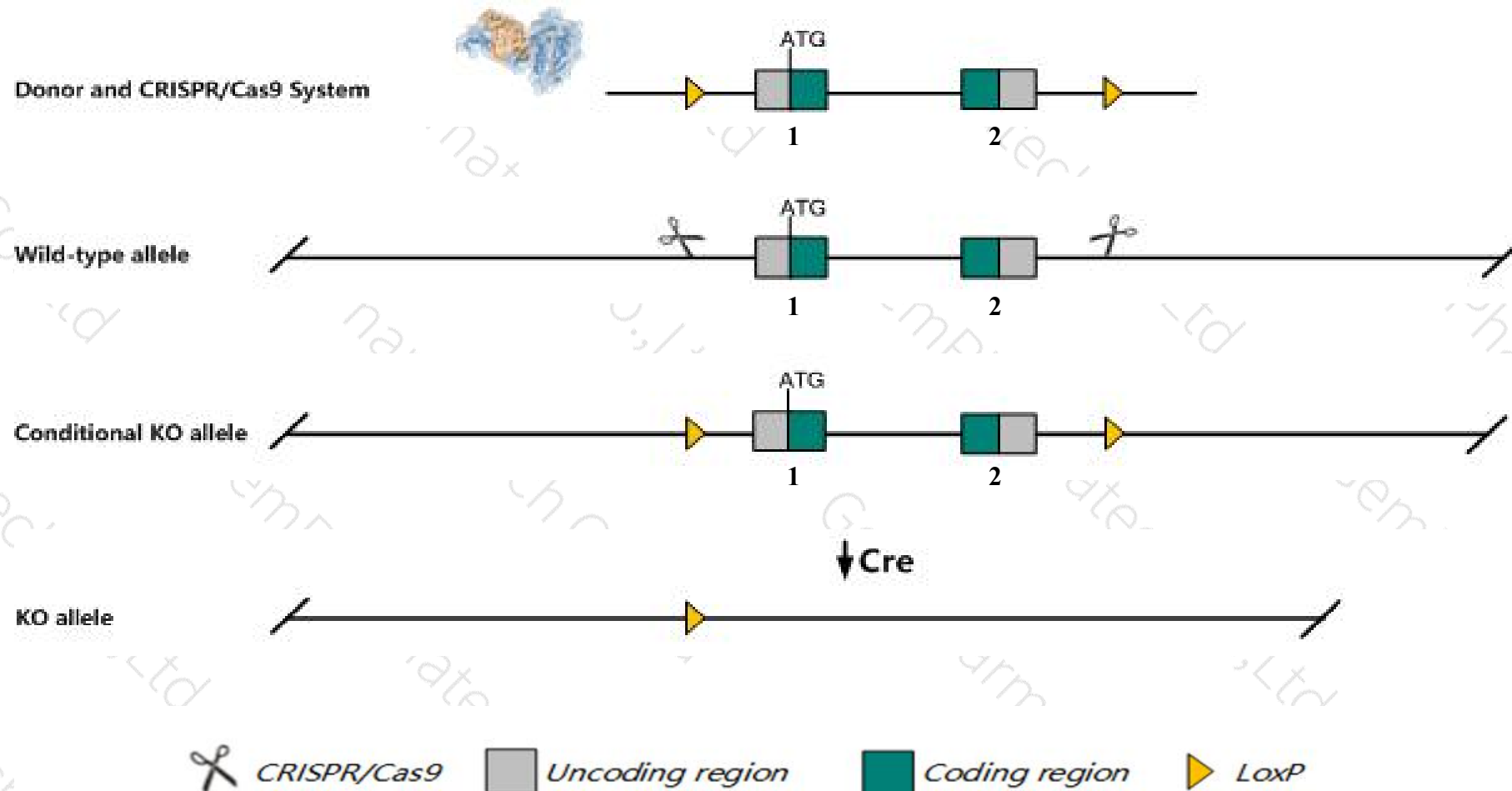
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Gsx2* gene. The schematic diagram is as follows:



- The *Gsx2* gene has 2 transcripts. According to the structure of *Gsx2* gene, exon1-exon2 of *Gsx2-201* (ENSMUST00000040477.3) transcript is recommended as the knockout region. The region contains all of the coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Gsx2* 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 targeted null mutation die within 24 hrs after birth, displaying an early misspecification of precursors in the lateral ganglionic eminence that leads to disruptions in striatal and olfactory bulb development.
- The *Gsx2* gene is located on the Chr5. 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)

Gsx2 GS homeobox 2 [*Mus musculus* (house mouse)]

Gene ID: 14843, updated on 31-Mar-2020

Summary

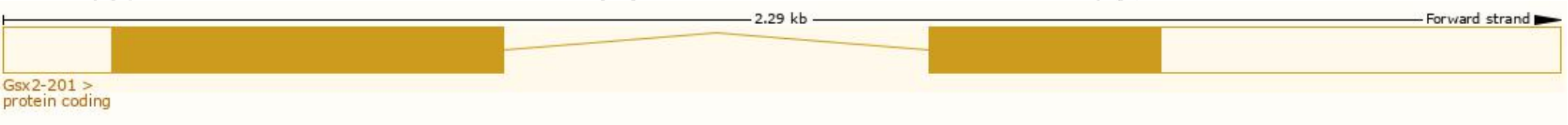
Official Symbol	Gsx2 provided by MGI
Official Full Name	GS homeobox 2 provided by MGI
Primary source	MGI:MGI:95843
See related	Ensembl:ENSMUSG00000035946
Gene type	protein coding
RefSeq status	PROVISIONAL
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Gsh2; Gsh-2
Expression	Biased expression in whole brain E14.5 (RPKM 1.5), CNS E11.5 (RPKM 1.5) and 4 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

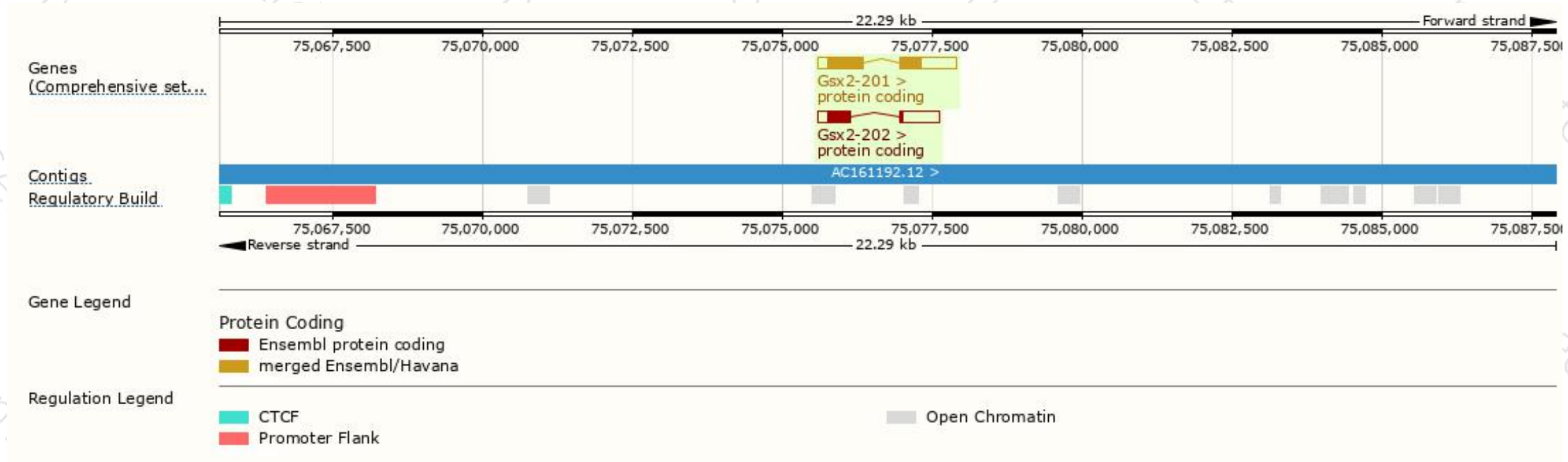
The gene has 2 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Gsx2-201	ENSMUST00000040477.3	1665	305aa	Protein coding	CCDS19350	P31316	TSL:1 GENCODE basic APPRIS P1
Gsx2-202	ENSMUST00000160104.2	1182	134aa	Protein coding	-	E0CZ09	TSL:1 GENCODE basic

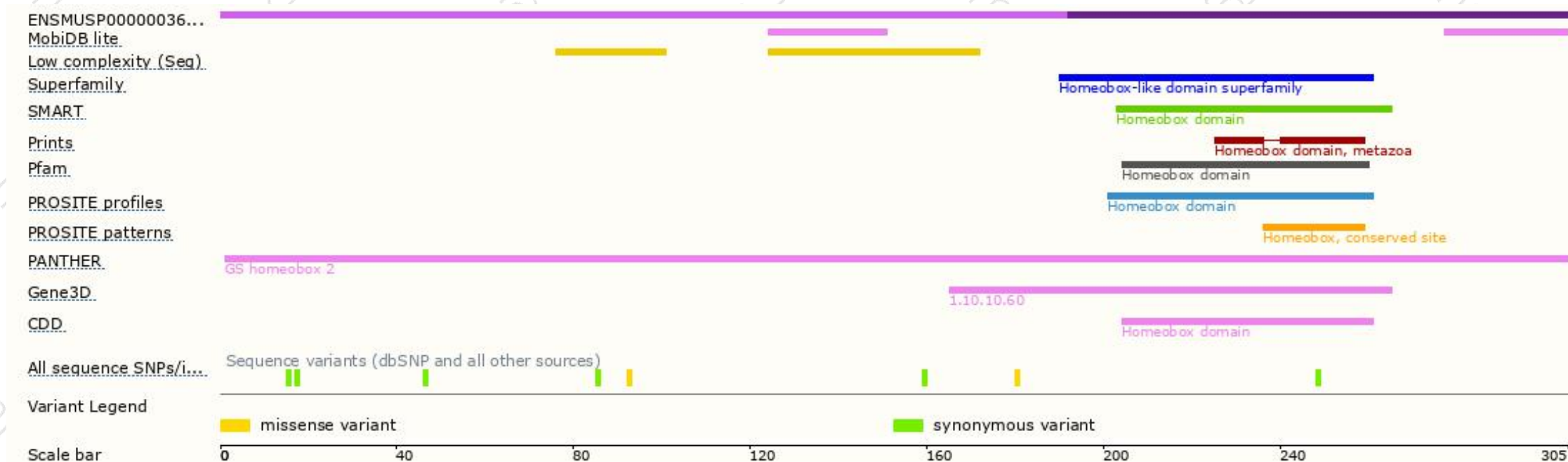
The strategy is based on the design of *Gsx2-201* transcript, the transcription is shown below



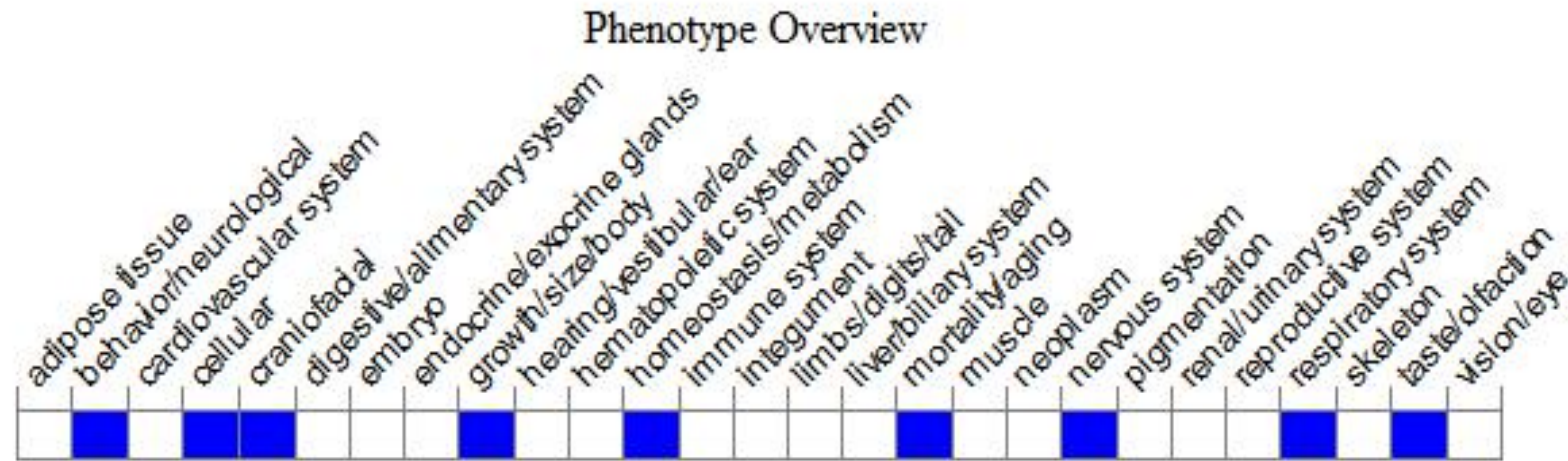
Genomic location distribution



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 targeted null mutation die within 24 hrs after birth, displaying an early misspecification of precursors in the lateral ganglionic eminence that leads to disruptions in striatal and olfactory bulb development.

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

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