

Lhx6 Cas9-KO Strategy

Designer: Huimin Su

Reviewer: Ruiuri Zhang

Design Date: 2020-6-23

Project Overview

Project Name

Lhx6

Project type

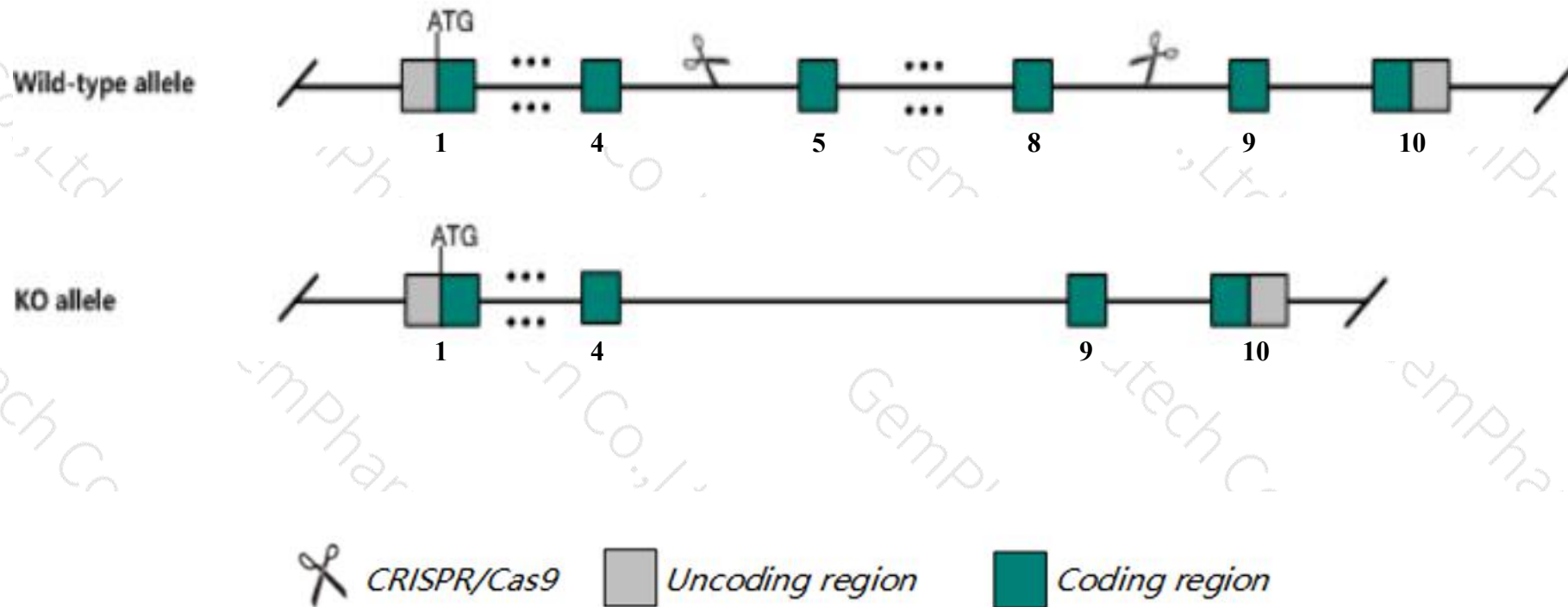
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Lhx6* gene. The schematic diagram is as follows:



- The *Lhx6* gene has 9 transcripts. According to the structure of *Lhx6* gene, exon5-exon8 of *Lhx6*-201(ENSMUST00000112960.7) transcript is recommended as the knockout region. The region contains 593bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Lhx6* 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, homozygous mutation of this gene results in impaired migration and specification of cortical interneurons, postnatal lethality and weakness.
- The *Lhx6* gene is located on the Chr2. 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)

Lhx6 LIM homeobox protein 6 [*Mus musculus* (house mouse)]

Gene ID: 16874, updated on 26-Apr-2020

Summary



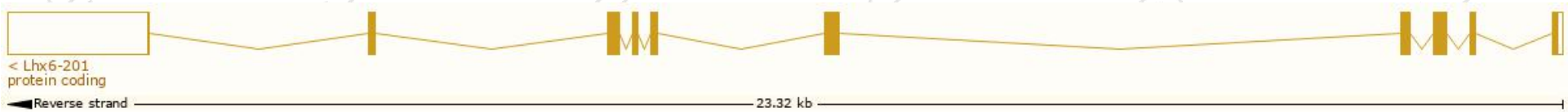
Official Symbol	Lhx6 provided by MGI
Official Full Name	LIM homeobox protein 6 provided by MGI
Primary source	MGI:MGI:1306803
See related	Ensembl:ENSMUSG00000026890
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Lhx6.1
Expression	Broad expression in CNS E18 (RPKM 4.6), whole brain E14.5 (RPKM 3.8) and 18 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

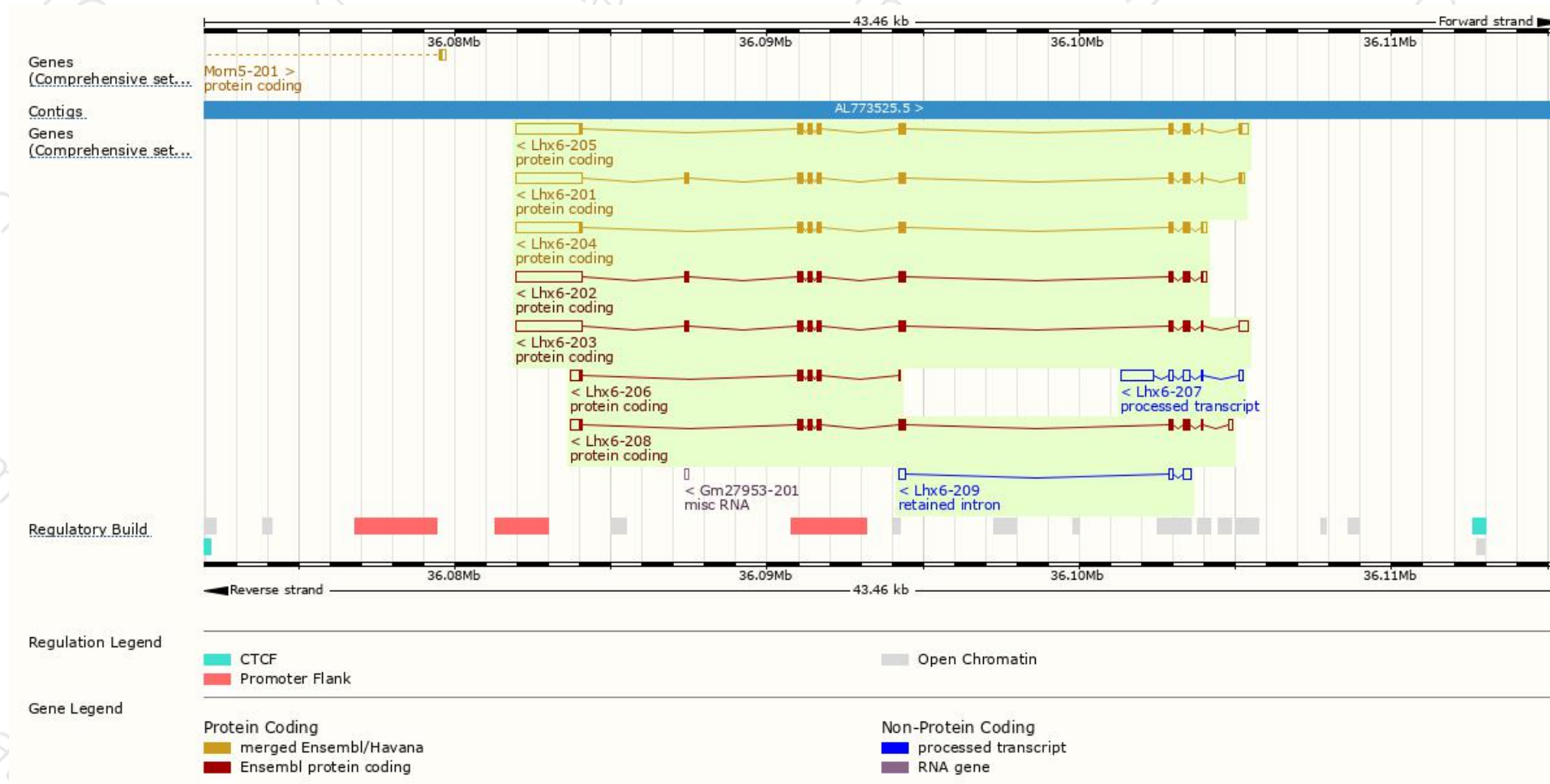
The gene has 9 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Lhx6-203	ENSMUST00000112963.7	3481	363aa	Protein coding	CCDS38113	Q9R1R0	TSL:2 GENCODE basic
Lhx6-205	ENSMUST00000112967.11	3378	377aa	Protein coding	CCDS38110	E9QN32	TSL:1 GENCODE basic APPRIS ALT1
Lhx6-201	ENSMUST00000112960.7	3345	392aa	Protein coding	CCDS38112	H9H9T0	TSL:2 GENCODE basic APPRIS P4
Lhx6-202	ENSMUST00000112961.9	3292	363aa	Protein coding	CCDS38113	Q9R1R0	TSL:1 GENCODE basic
Lhx6-204	ENSMUST00000112966.9	3188	348aa	Protein coding	CCDS38111	Q9R1R0	TSL:1 GENCODE basic
Lhx6-208	ENSMUST00000148852.3	1481	348aa	Protein coding	CCDS38111	Q9R1R0	TSL:5 GENCODE basic
Lhx6-206	ENSMUST00000136821.8	825	170aa	Protein coding	-	H3BLG4	CDS 5' incomplete TSL:3
Lhx6-207	ENSMUST00000137436.2	1551	No protein	Processed transcript	-	-	TSL:1
Lhx6-209	ENSMUST00000187180.6	578	No protein	Retained intron	-	-	TSL:3

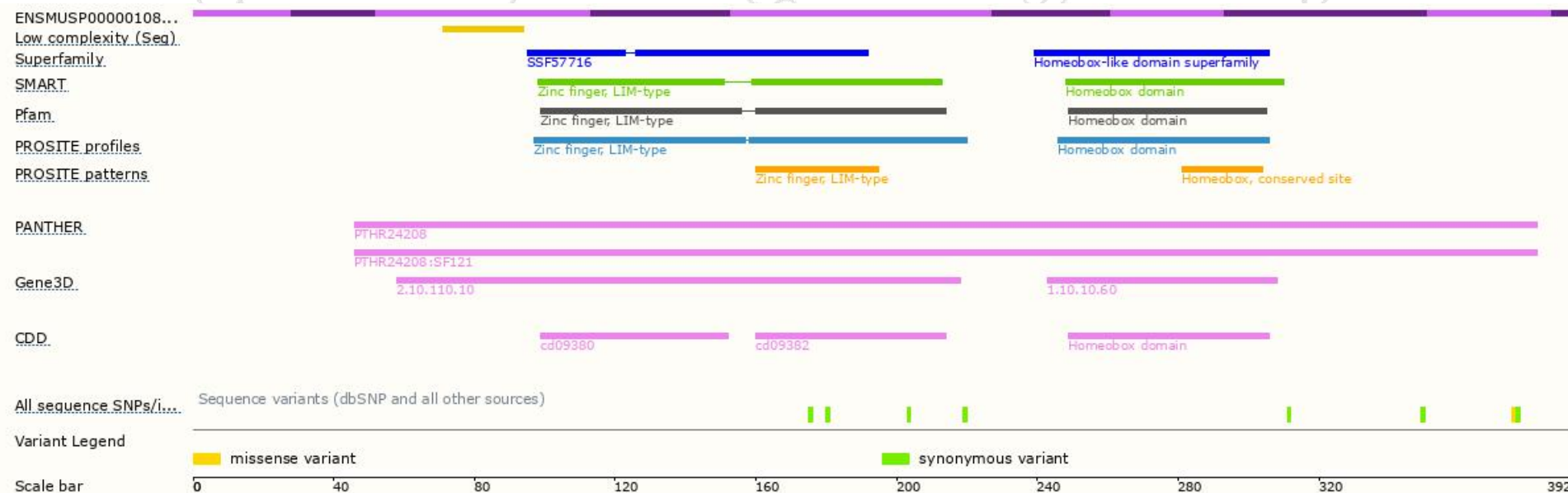
The strategy is based on the design of *Lhx6-201* transcript,the transcription is shown below:



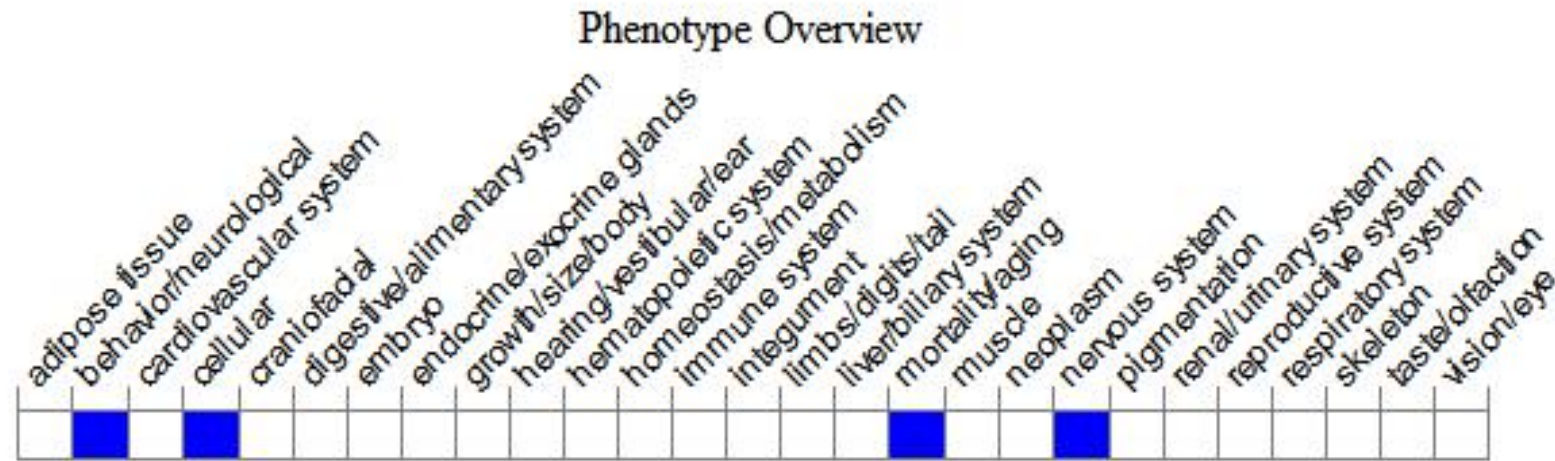
Genomic location distribution



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 mutation of this gene results in impaired migration and specification of cortical interneurons, postnatal lethality and weakness.

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

Tel: 400-9660890

