

Lhx4 Cas9-KO Strategy

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Design Date: 2020-7-22

Project Overview

Project Name

Lhx4

Project type

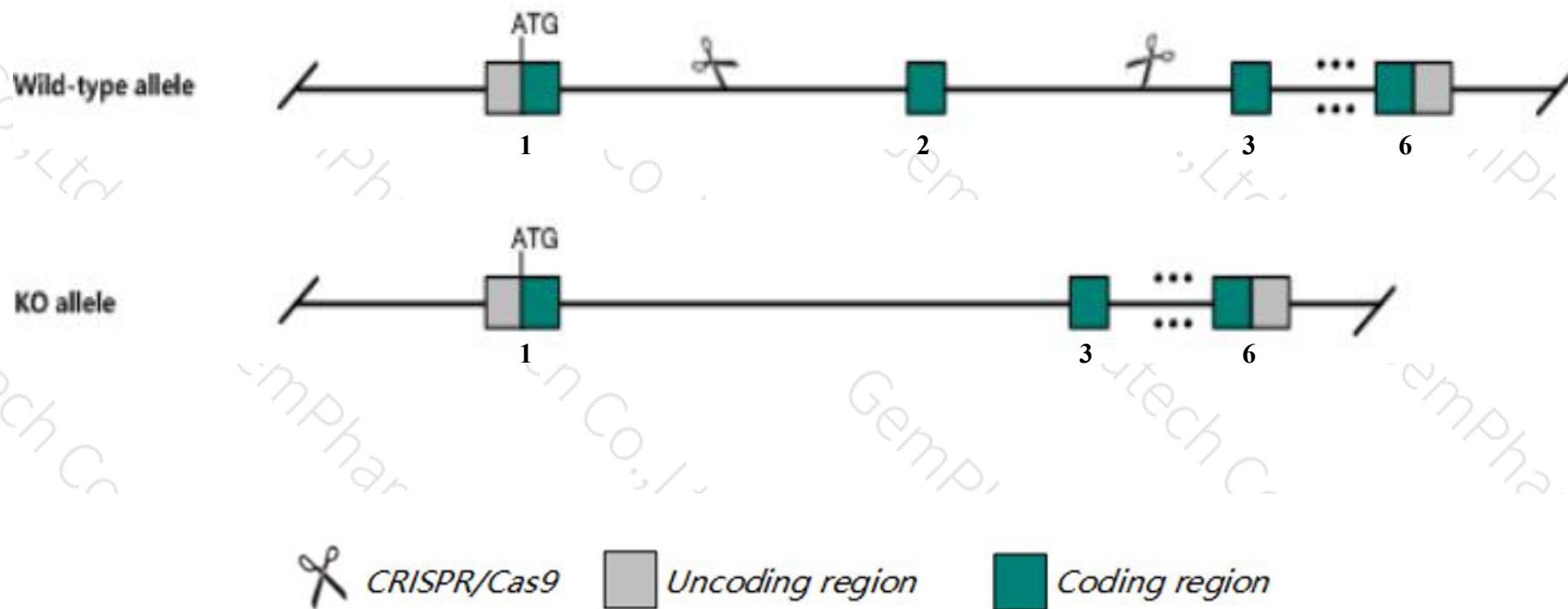
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Lhx4* gene. The schematic diagram is as follows:



- The *Lhx4* gene has 2 transcripts. According to the structure of *Lhx4* gene, exon2 of *Lhx4-201*(ENSMUST00000027740.13) transcript is recommended as the knockout region. The region contains 172bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Lhx4* 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, mutations in this gene result in abnormal lung development and neonatal lethality.
- The *Lhx4* 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 the gene knockout on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

Gene information (NCBI)

Lhx4 LIM homeobox protein 4 [Mus musculus (house mouse)]

Gene ID: 16872, updated on 13-Mar-2020

Summary



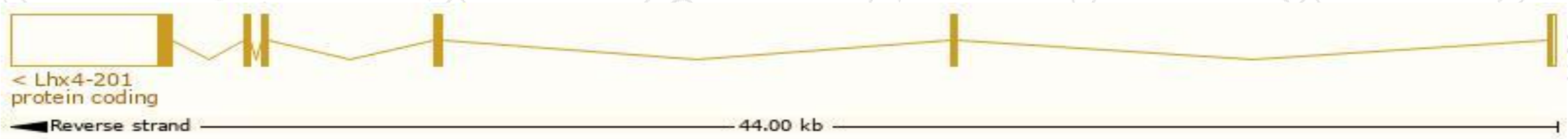
Official Symbol	Lhx4 provided by MGI
Official Full Name	LIM homeobox protein 4 provided by MGI
Primary source	MGI:MGI:101776
See related	Ensembl:ENSMUSG00000026468
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	A330062J17Rik, Gsh-4, Gsh4
Expression	Low expression observed in reference dataset See more
Orthologs	human all

Transcript information (Ensembl)

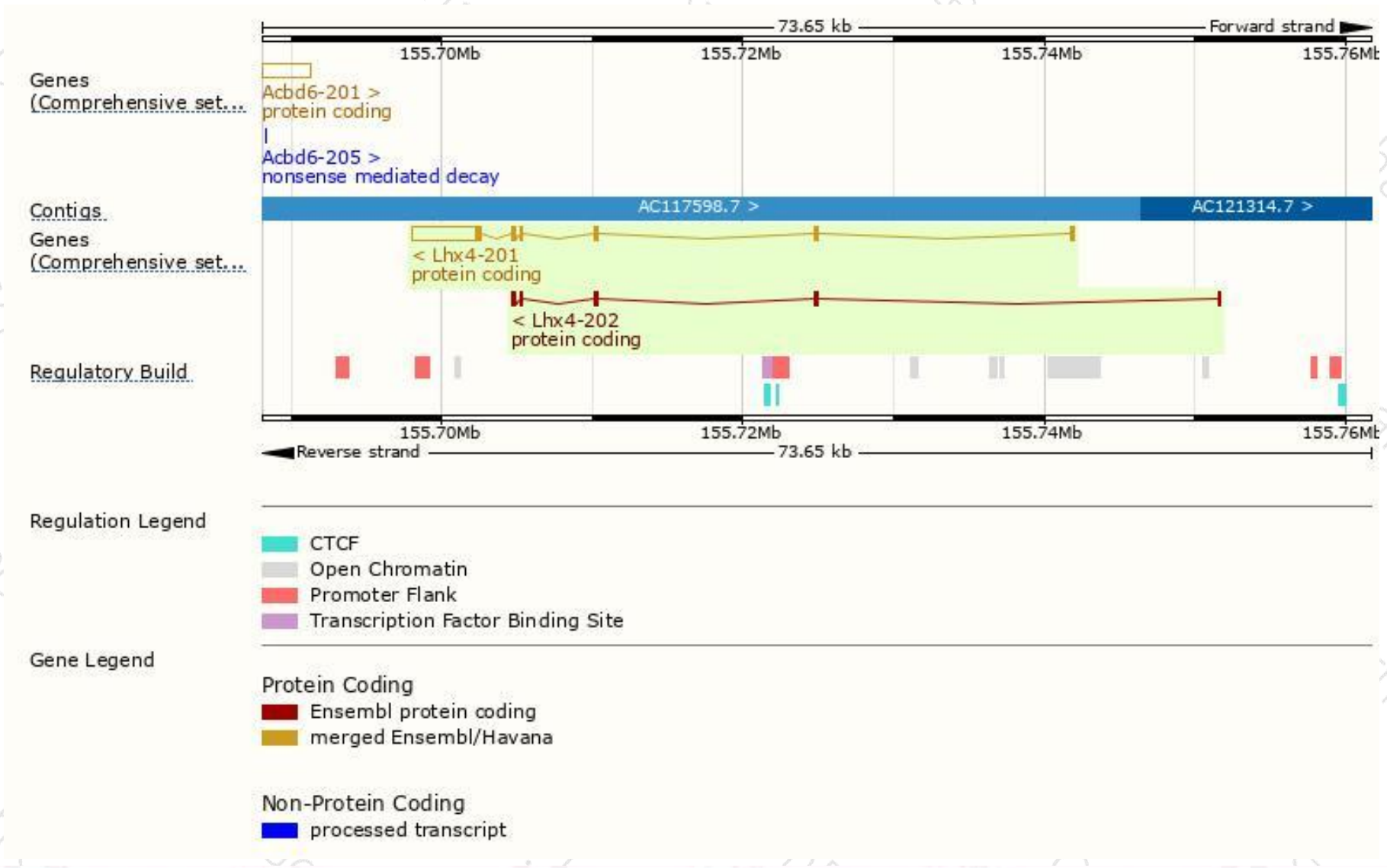
The gene has 2 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Lhx4-201	ENSMUST00000027740.13	5514	390aa	Protein coding	CCDS48399	P53776	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
Lhx4-202	ENSMUST00000195275.1	928	223aa	Protein coding	-	A0A0A6YWR5	CDS 3' incomplete TSL:5

The strategy is based on the design of *Lhx4-201* transcript,the transcription is shown below:



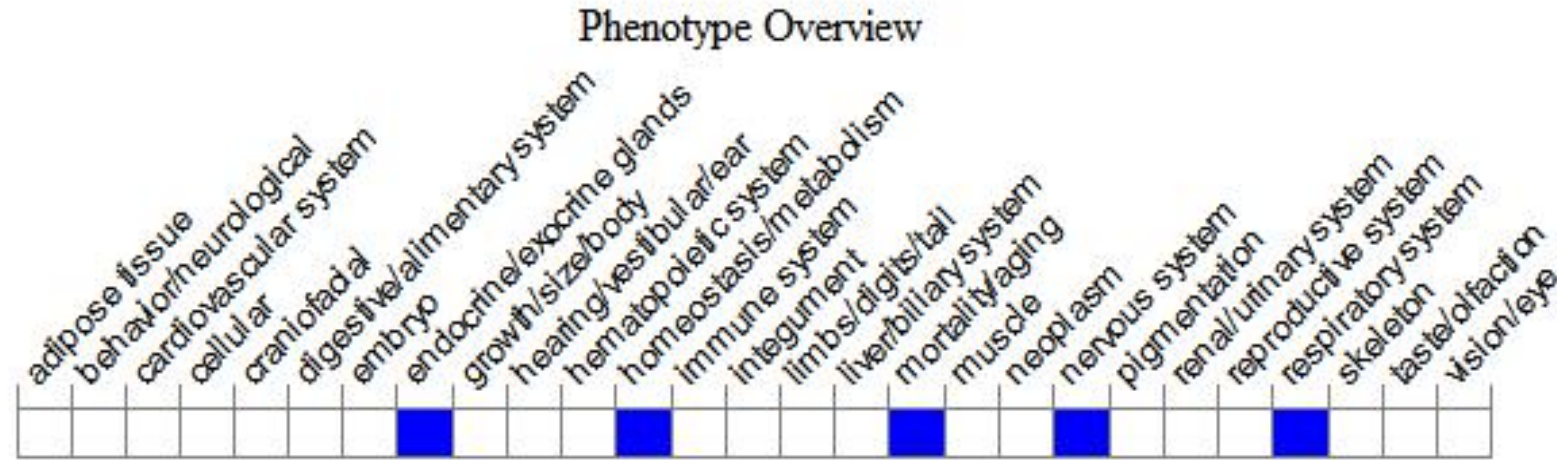
Genomic location distribution



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, mutations in this gene result in abnormal lung development and neonatal lethality.

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

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