

Lrp6 Cas9-CKO Strategy

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Project Overview

Project Name

Lrp6

Project type

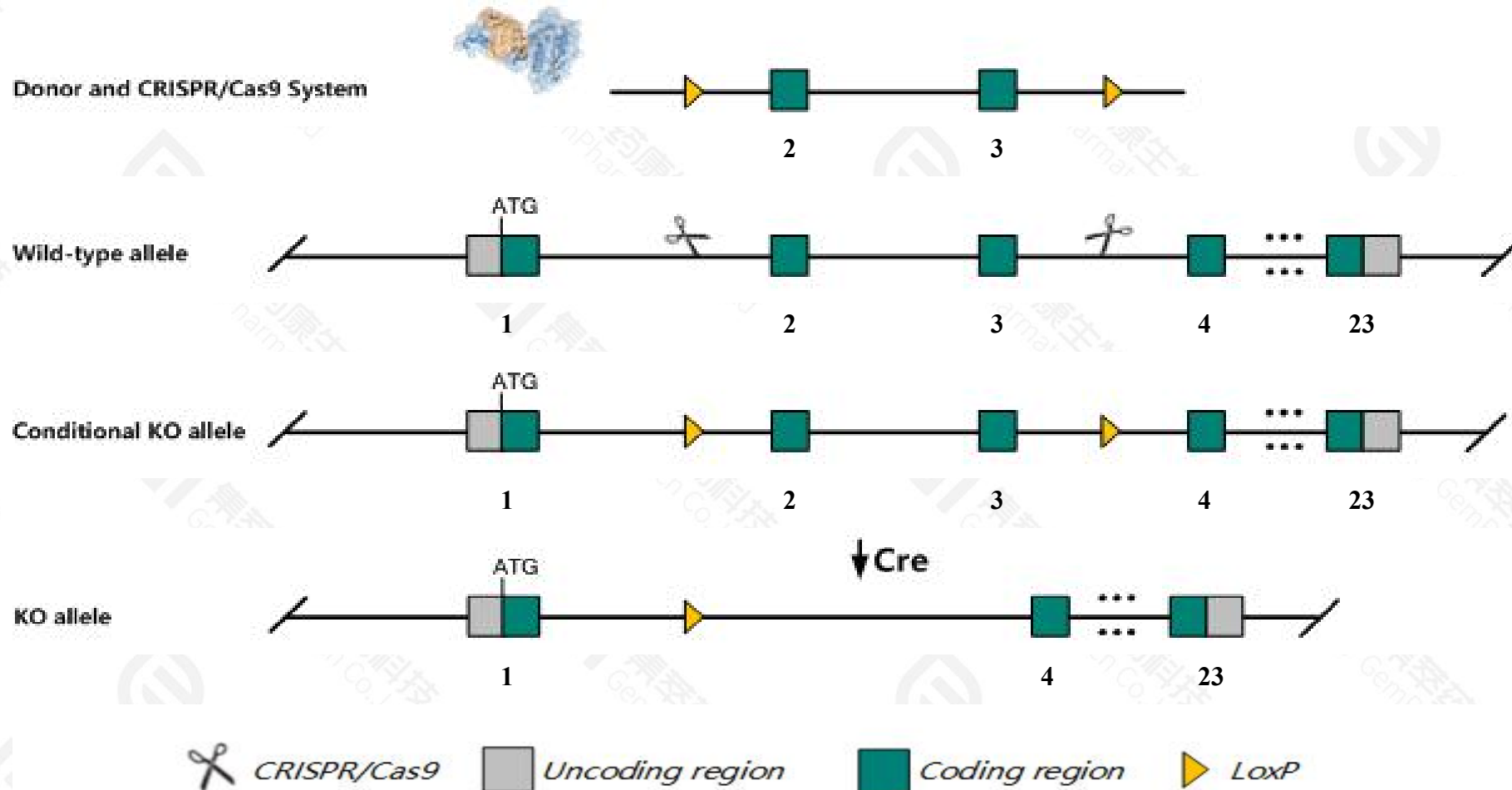
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Lrp6* gene. The schematic diagram is as follows:



- The *Lrp6* gene has 6 transcripts. According to the structure of *Lrp6* gene, exon2-exon3 of *Lrp6*-201(ENSMUST00000032322.15) transcript is recommended as the knockout region. The region contains 592bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Lrp6* 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, animals homozygous for this mutation exhibit partial embryonic lethality, growth retardation, crooked tail, abnormal vertebrae, small skull with occasional bent nose, absence of the third molars and small and/or unerupted lower incisors. Heterozygotes exhibit a crooked tail and abnormal vertebrae.
- The *Lrp6* gene is located on the Chr6. 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)

Lrp6 low density lipoprotein receptor-related protein 6 [Mus musculus (house mouse)]

Gene ID: 16974, updated on 22-Mar-2020

Summary

Official Symbol Lrp6 provided by [MGI](#)

Official Full Name low density lipoprotein receptor-related protein 6 provided by [MGI](#)

Primary source [MGI:MGI:1298218](#)

See related [Ensembl:ENSMUSG00000030201](#)

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 C030016K15Rik, Cd, Gw, ska26, ska, skax26

Expression Ubiquitous expression in bladder adult (RPKM 13.4), kidney adult (RPKM 13.4) and 28 other tissues [See more](#)

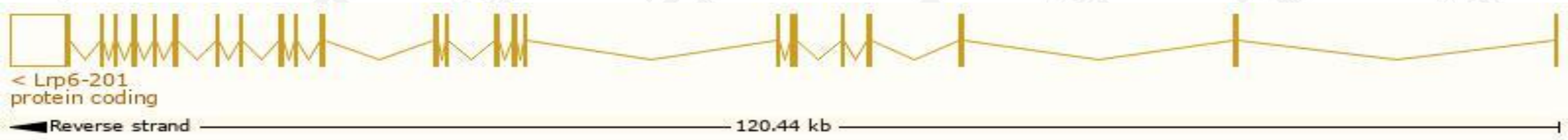
Orthologs [human](#) [all](#)

Transcript information (Ensembl)

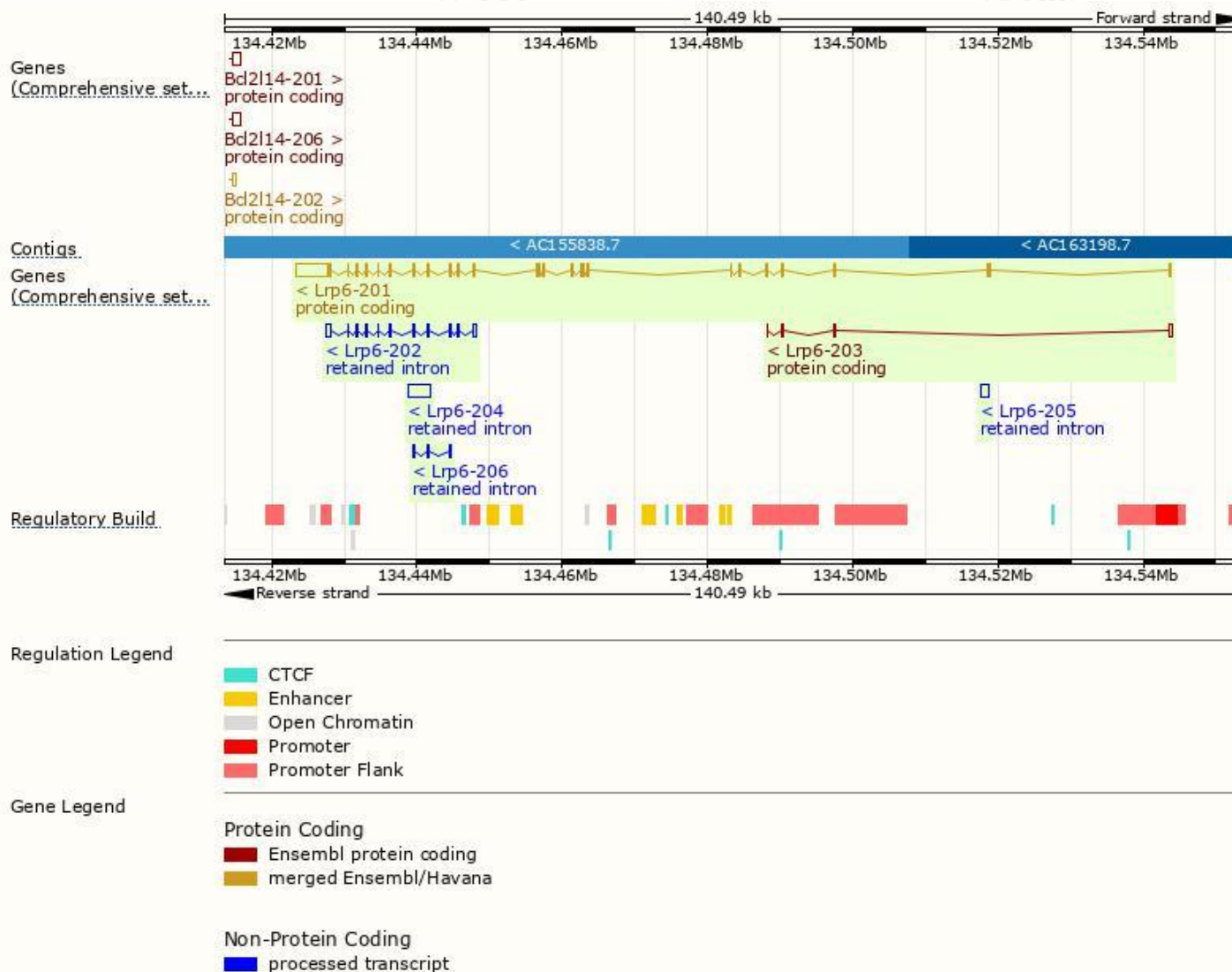
The gene has 6 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Lrp6-201	ENSMUST00000032322.14	9368	1613aa	Protein coding	CCDS39678	A0A0R4J0A9	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
Lrp6-203	ENSMUST00000126836.3	722	131aa	Protein coding	-	A0A0N4SUL9	CDS 3' incomplete TSL:5
Lrp6-204	ENSMUST00000203016.1	3246	No protein	Retained intron	-	-	TSL:NA
Lrp6-202	ENSMUST00000111950.3	2756	No protein	Retained intron	-	-	TSL:1
Lrp6-205	ENSMUST00000203235.1	941	No protein	Retained intron	-	-	TSL:NA
Lrp6-206	ENSMUST00000203773.1	727	No protein	Retained intron	-	-	TSL:3

The strategy is based on the design of *Lrp6-201* transcript,the transcription is shown below:



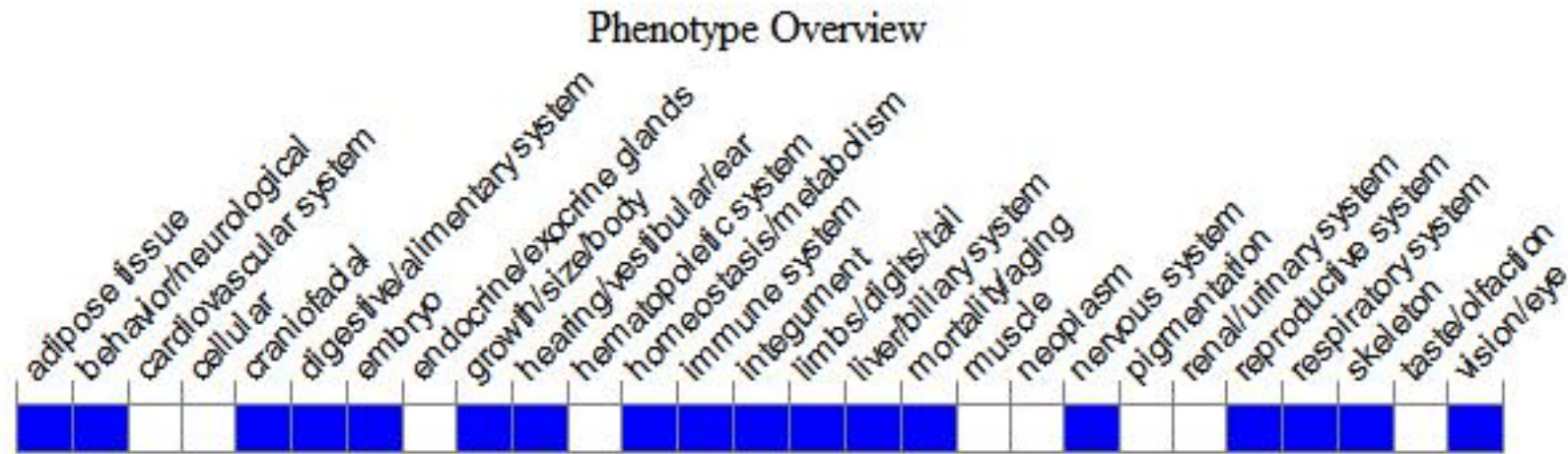
Genomic location distribution



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, animals homozygous for this mutation exhibit partial embryonic lethality, growth retardation, crooked tail, abnormal vertebrae, small skull with occasional bent nose, absence of the third molars and small and/or unerupted lower incisors. Heterozygotes exhibit a crooked tail and abnormal vertebrae.

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