

Lats1 Cas9-CKO Strategy

Designer:

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Design Date:

2029-7-25

Project Overview

Project Name

Lats1

Project type

Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

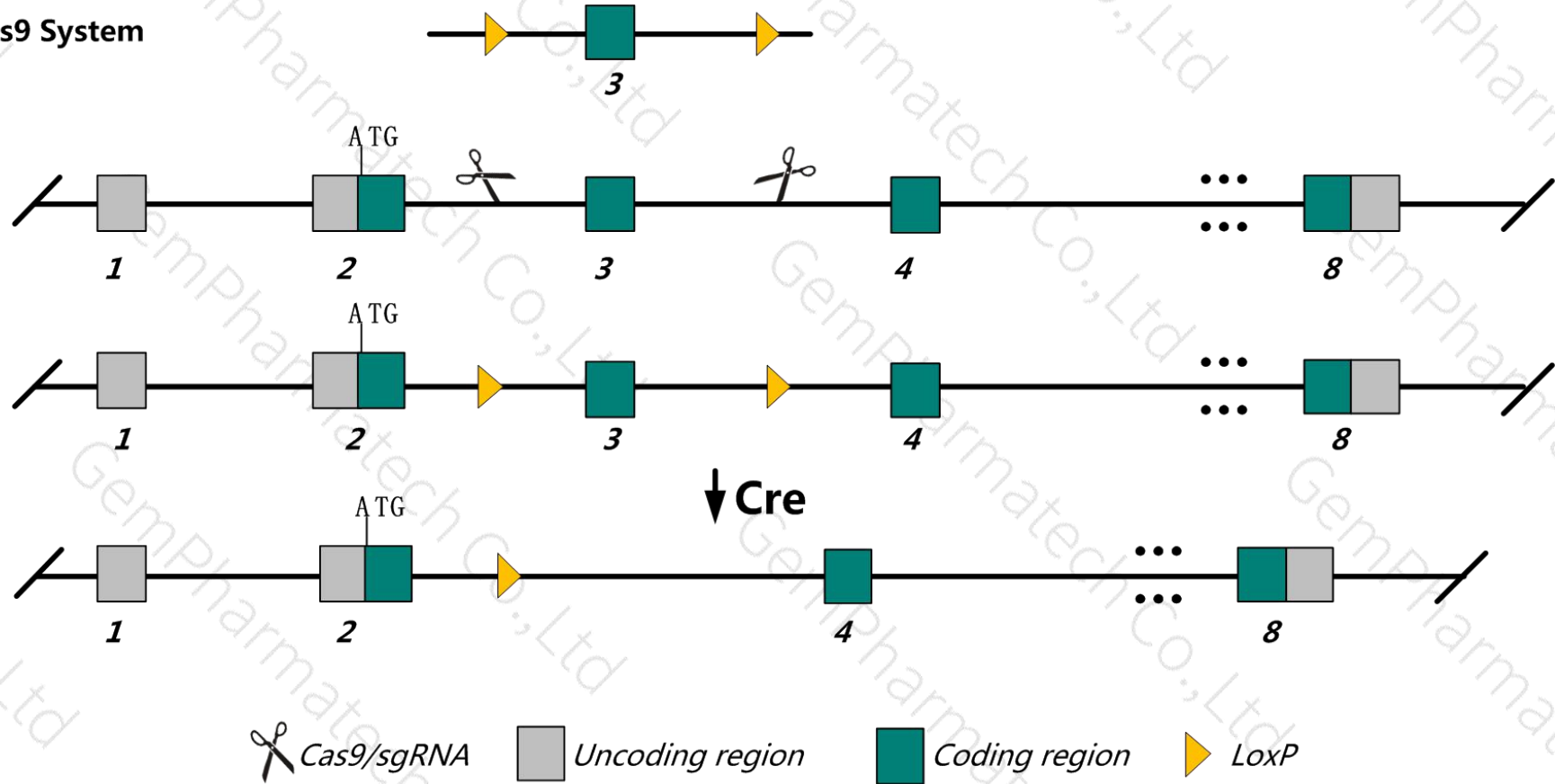
This model will use CRISPR/Cas9 technology to edit the *Lats1* gene. The schematic diagram is as follows:

Donor and CRISPR/Cas9 System

Wild-type allele

Conditional KO allele

KO allele



Technical routes

- The *Lats1* gene has 3 transcript. According to the structure of *Lats1* gene, exon3 of *Lats1*-202 transcript is recommended as the knockout region. The region contains 148bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Lats1* gene. The brief process is as follows: gRNA was transcribed in vitro, donor was constructed. Cas9, gRNA 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 or cell types.

- According to the existing MGI data , Homozygotes for a targeted null mutation exhibit high postnatal mortality, lack of mammary development, infertility, pituitary hyperplasia, reduced hormone levels, growth retardation, and susceptibility to sarcomas and ovarian stromal cell tumors.
- The *Lats1* gene is located on the Chr10. 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

Gene information (NCBI)

Lats1 large tumor suppressor [*Mus musculus* (house mouse)]

Gene ID: 16798, updated on 28-May-2019

Summary



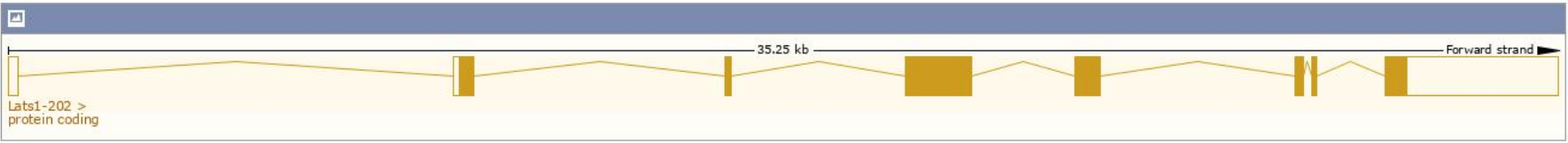
Official Symbol	Lats1 provided by MGI
Official Full Name	large tumor suppressor provided by MGI
Primary source	MGI:MGI:1333883
See related	Ensembl:ENSMUSG00000040021
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	AW208599
Expression	Ubiquitous expression in whole brain E14.5 (RPKM 8.7), CNS E18 (RPKM 8.2) and 28 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

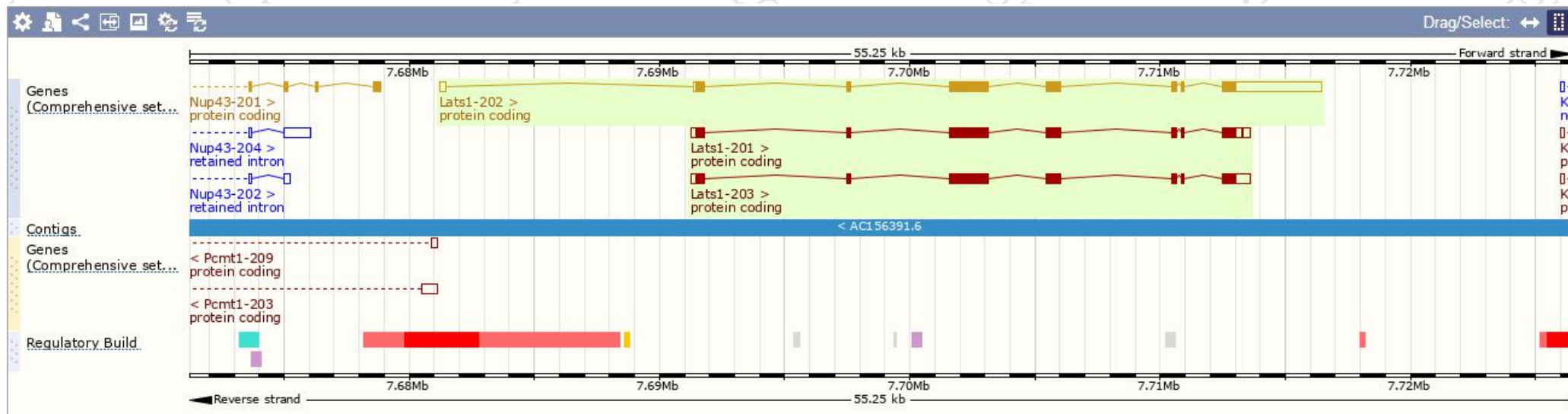
The gene has 3 transcripts, and all transcripts are shown below:

Show/hide columns (1 hidden)							Filter	
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags	
Lats1-202	ENSMUST00000165952.8	7209	1129aa	Protein coding	CCDS48494	Q8BYR2	TSL:1	GENCODE basic APPRIS P1
Lats1-203	ENSMUST00000217931.1	4186	1129aa	Protein coding	CCDS48494	Q8BYR2	TSL:1	GENCODE basic APPRIS P1
Lats1-201	ENSMUST00000040043.6	4155	1129aa	Protein coding	CCDS48494	Q8BYR2	TSL:5	GENCODE basic APPRIS P1

The strategy is based on the design of *Lats1*-202 transcript, The transcription is shown below



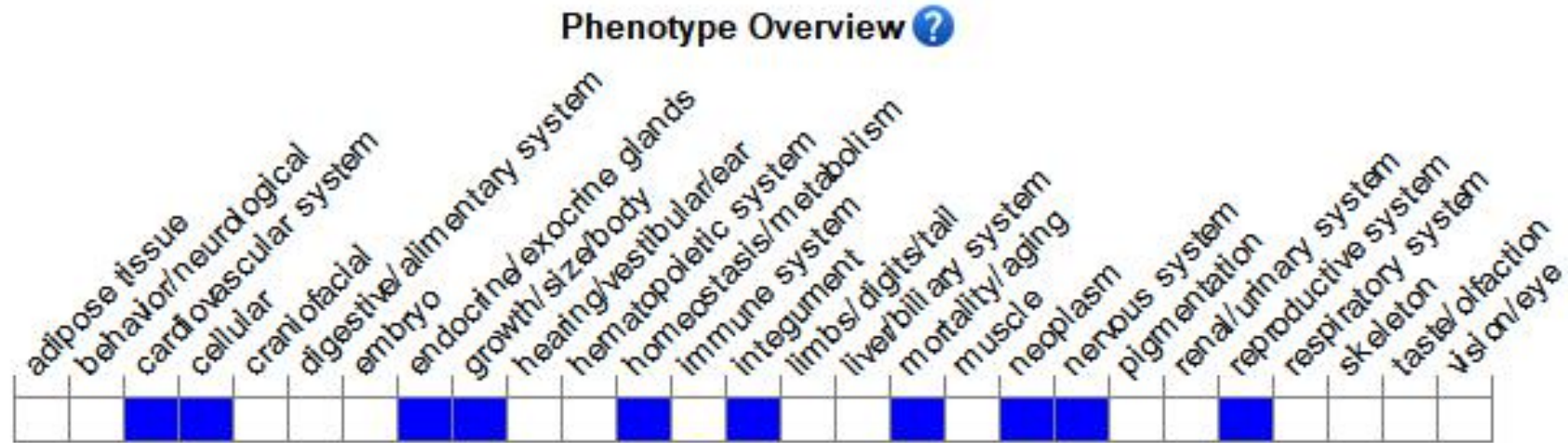
Genomic location distribution



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 locus affect cell-cycle regulation and apoptosis. Null homozygotes show high, early-onset tumor incidence; some have persistent hyaloid vasculature and cataracts. Truncated or temperature-sensitive alleles cause early aging phenotypes.

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