

Atg13 Cas9-CKO Strategy

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Project Overview

Project Name

Atg13

Project type

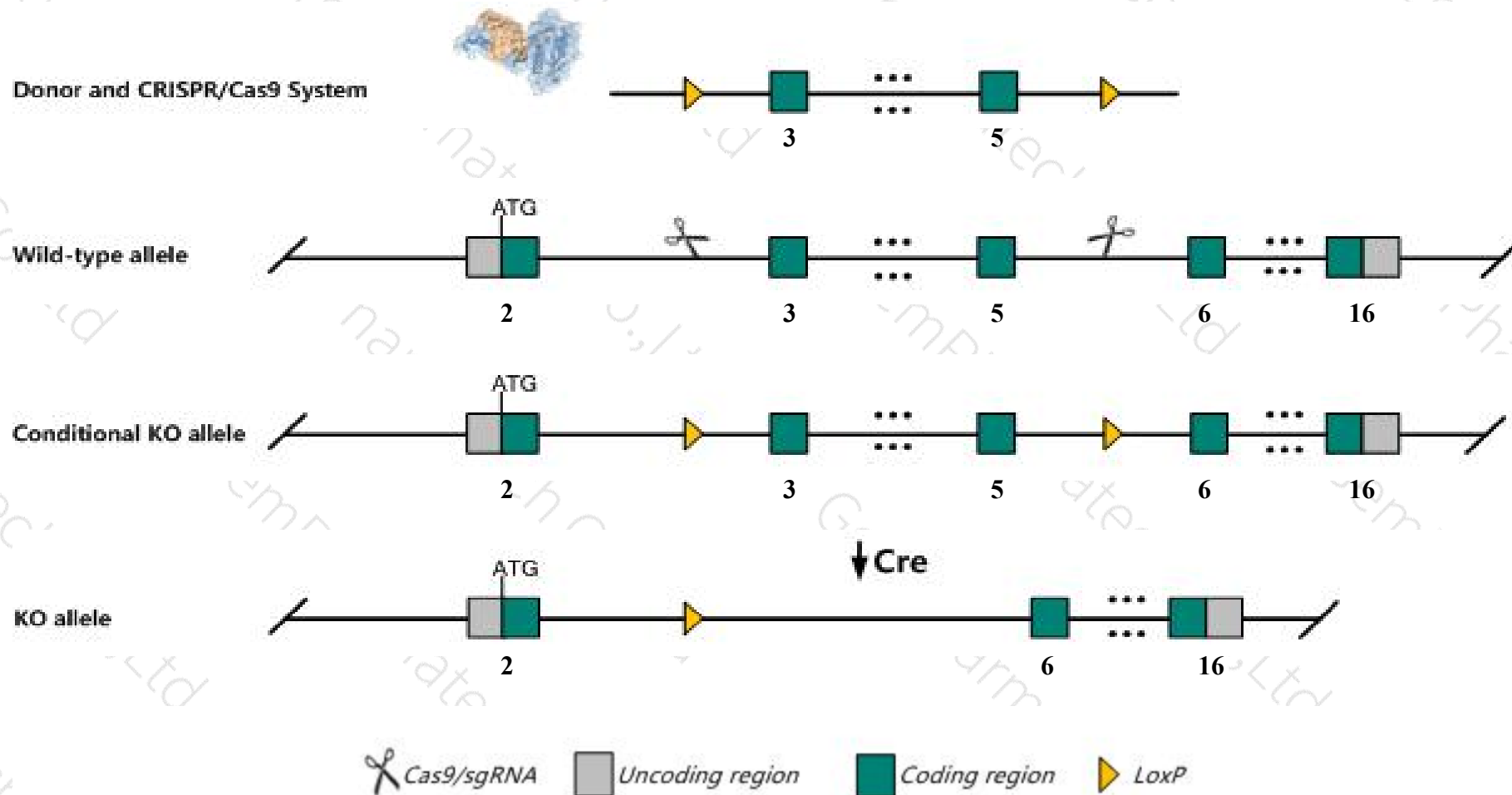
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Atg13* gene. The schematic diagram is as follows:



Technical routes

- The *Atg13* gene has 6 transcripts. According to the structure of *Atg13* gene, exon3-exon5 of *Atg13*-202(ENSMUST00000076803.11) transcript is recommended as the knockout region. The region contains 248bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Atg13* gene. The brief process is as follows: sgRNA was transcribed in vitro, donor vector was constructed. Cas9, sgRNA 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 was 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 null mutation display lethality during fetal growth and development with thinning of the cardiac ventricular wall.
- Transcript *Atg13-203*, *205*, *206* may not be affected.
- The *Atg13* 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at existing technological level.

Gene information (NCBI)

Atg13 autophagy related 13 [Mus musculus (house mouse)]

Gene ID: 51897, updated on 13-Mar-2020

Summary



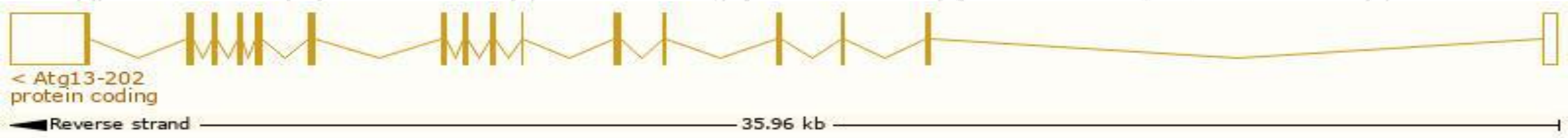
Official Symbol	Atg13 provided by MGI
Official Full Name	autophagy related 13 provided by MGI
Primary source	MGI:MGI:1196429
See related	Ensembl:ENSMUSG00000027244
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	1110053A20Rik, D2Ertd391e, Harbi1
Expression	Ubiquitous expression in cerebellum adult (RPKM 21.0), adrenal adult (RPKM 19.8) and 28 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

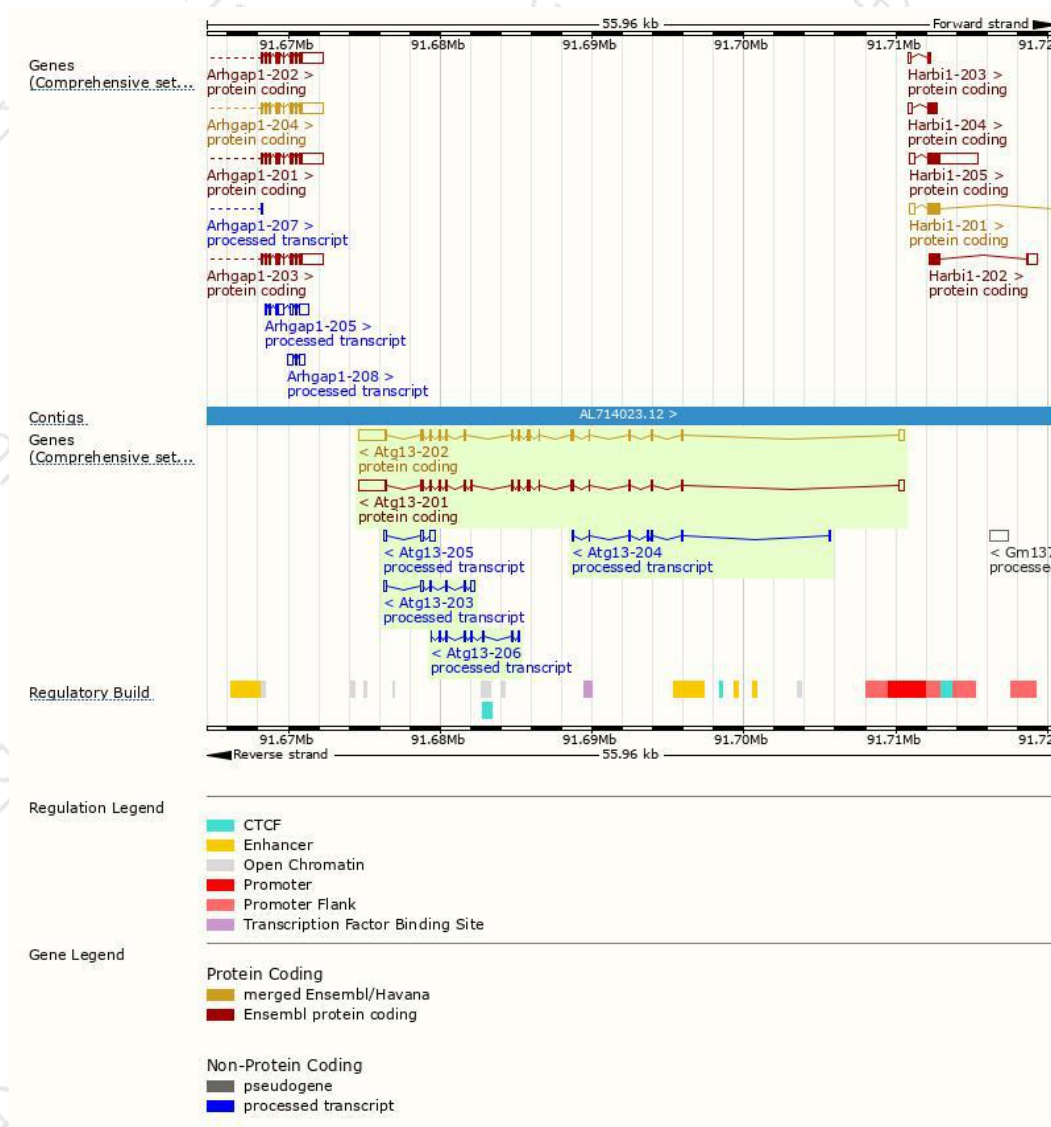
The gene has 6 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Atg13-202	ENSMUST00000076803.11	3551	479aa	Protein coding	CCDS16438	Q91YI1	TSL:1 GENCODE basic APPRIS P2
Atg13-201	ENSMUST00000028678.8	3604	516aa	Protein coding	-	Q91YI1	TSL:5 GENCODE basic APPRIS ALT1
Atg13-203	ENSMUST00000126000.7	848	No protein	Processed transcript	-	-	TSL:3
Atg13-206	ENSMUST00000153631.1	776	No protein	Processed transcript	-	-	TSL:5
Atg13-205	ENSMUST00000139548.7	693	No protein	Processed transcript	-	-	TSL:1
Atg13-204	ENSMUST00000136412.1	644	No protein	Processed transcript	-	-	TSL:2

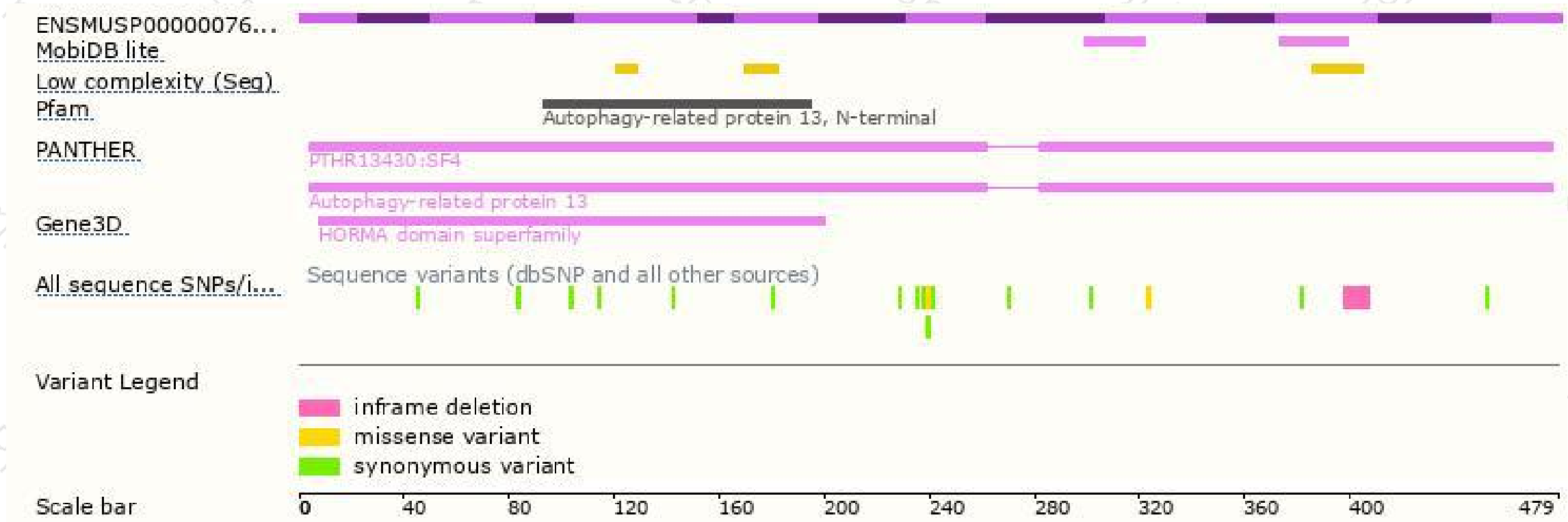
The strategy is based on the design of *Atg13-202* transcript,the transcription is shown below:



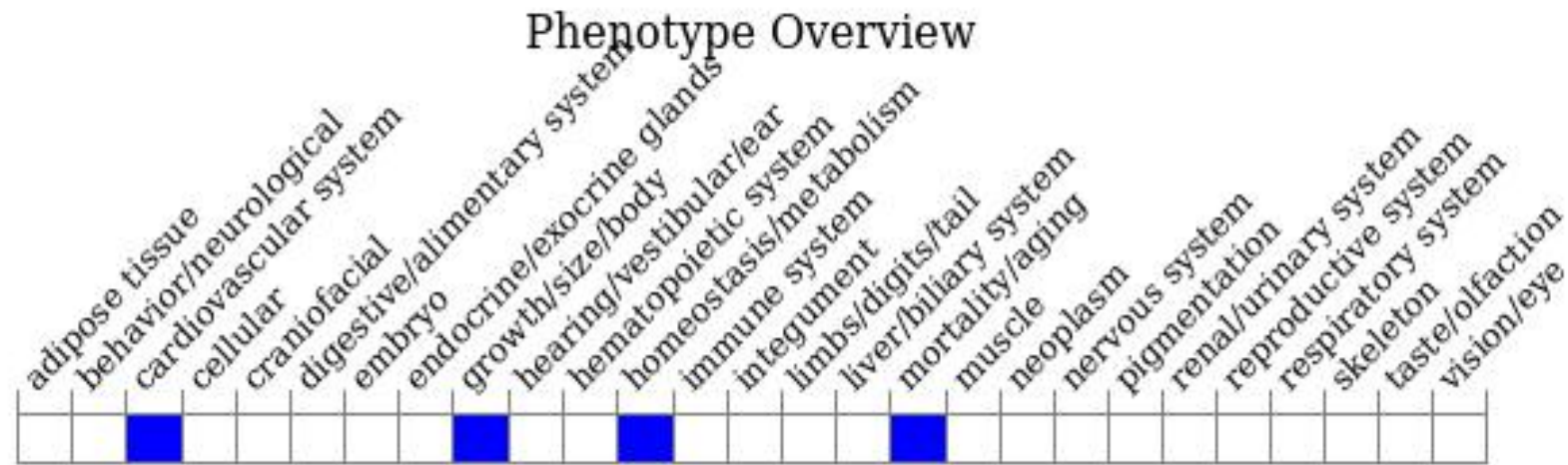
Genomic location distribution



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, mice homozygous for a null mutation display lethality during fetal growth and development with thinning of the cardiac ventricular wall.

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

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