Atg4c Cas9-CKO Strategy

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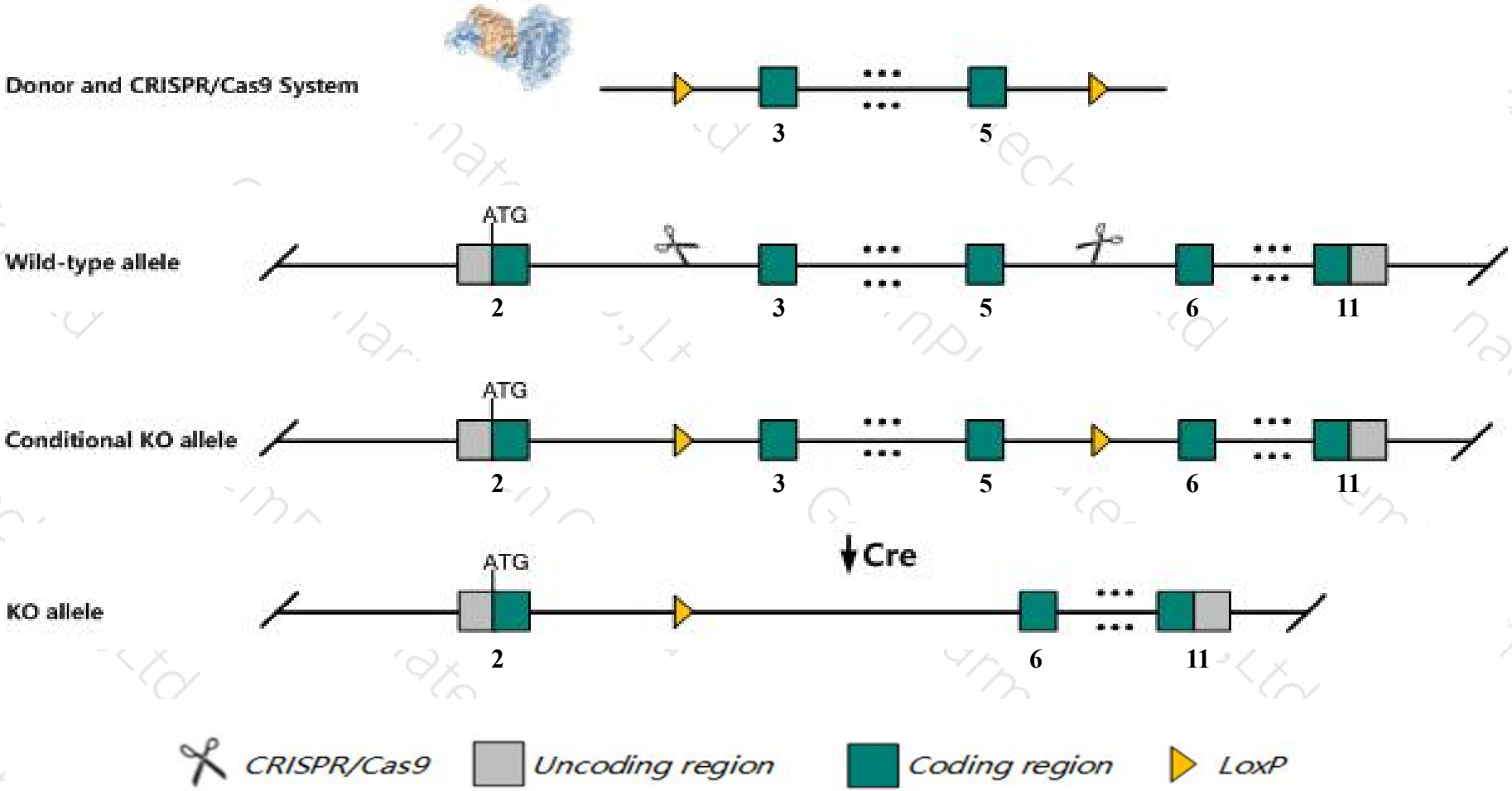
Project Overview

Project Name	***Atg4c***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Atg4c* gene. The schematic diagram is as follows:



Technical routes

- The *Atg4c* gene has 3 transcripts. According to the structure of *Atg4c* gene, exon3-exon5 of *Atg4c-201* (ENSMUST00000030279.14) transcript is recommended as the knockout region.The region contains 649bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Atg4c* 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.

Notice

- According to the existing MGI data,Mice homozygous for a knock-out allele show a higher incidence of chemically-induced fibrosarcomas, and exhibit both a significant reduction of autophagic activity in the diaphragm muscle as well as decreased locomotor activity after prolonged starvation.

- The *Atg4c* gene is located on the Chr4. 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）

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Atg4c autophagy related 4C, cysteine peptidase [Mus musculus (house mouse)]

Gene ID: 242557, updated on 9-Mar-2019

Summary

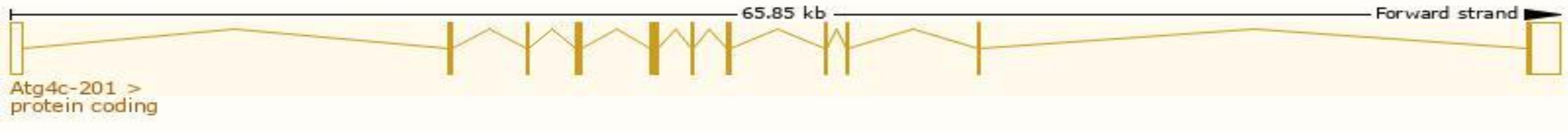
Official Symbol	Atg4c provided by MGI
Official Full Name	autophagy related 4C, cysteine peptidase provided by MGI
Primary source	MGI:MGI:2651854
See related	Ensembl:ENSMUSG00000028550
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Apg4-C, Apg4c, Atg4cl, Autl1
Expression	Ubiquitous expression in cortex adult (RPKM 2.2), frontal lobe adult (RPKM 1.8) and 26 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

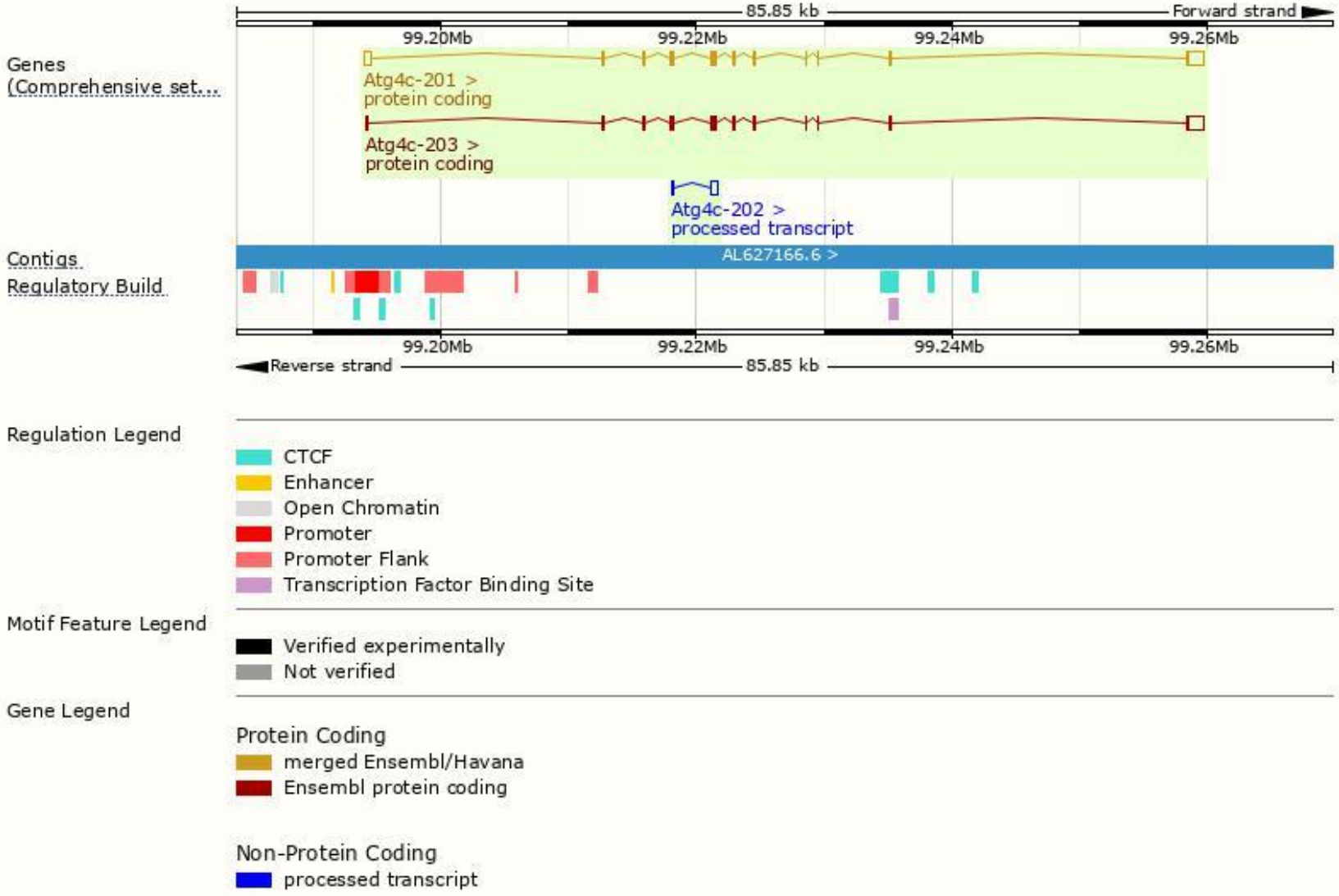
The gene has 3 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Atg4c-201	ENSMUST00000030279.14	3178	458aa	Protein coding	CCDS18382	Q811C2	TSL:1 GENCODE basic APPRIS P1
Atg4c-203	ENSMUST00000180278.1	2792	458aa	Protein coding	CCDS18382	Q811C2	TSL:5 GENCODE basic APPRIS P1
Atg4c-202	ENSMUST00000152121.1	612	No protein	Processed transcript	-	-	TSL:3

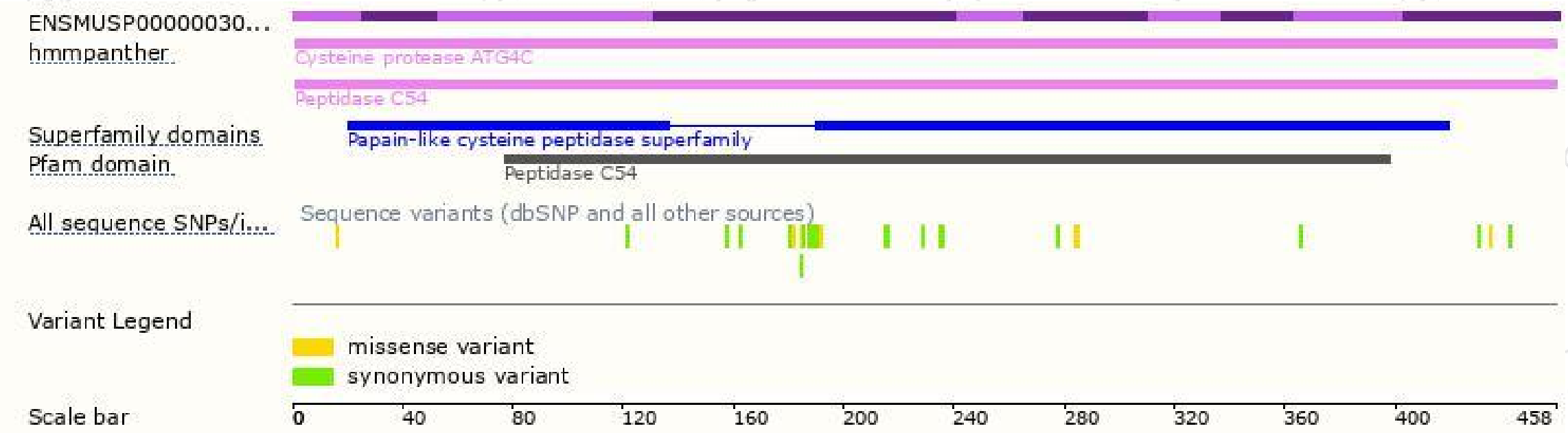
The strategy is based on the design of *Atg4c-201* transcript,The transcription is shown below



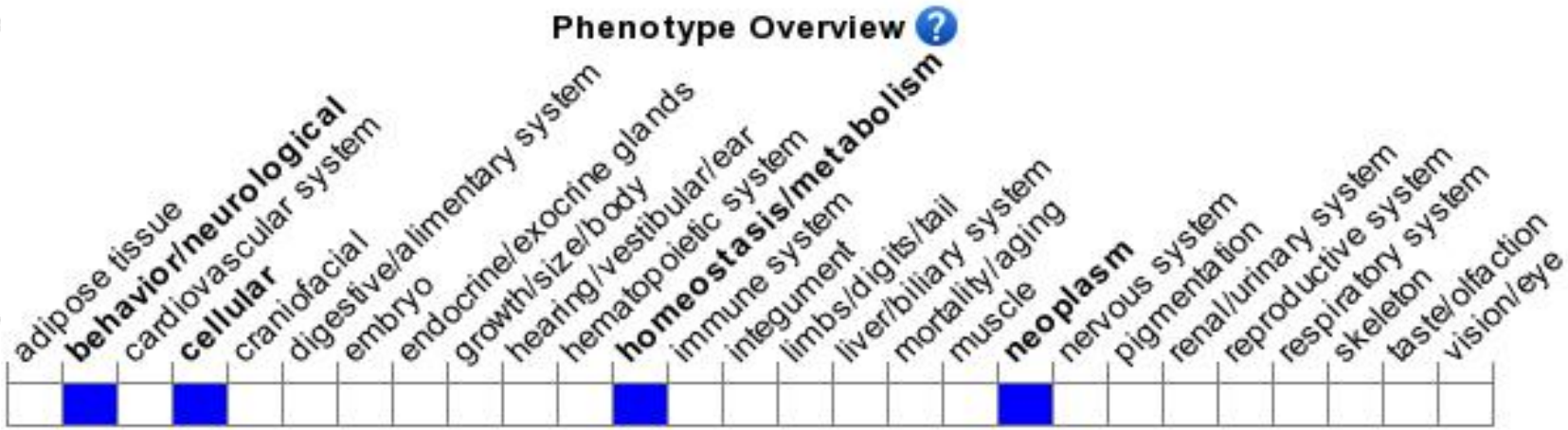
Genomic location distribution



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/).

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

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