Ulk4 Cas9-CKO Strategy

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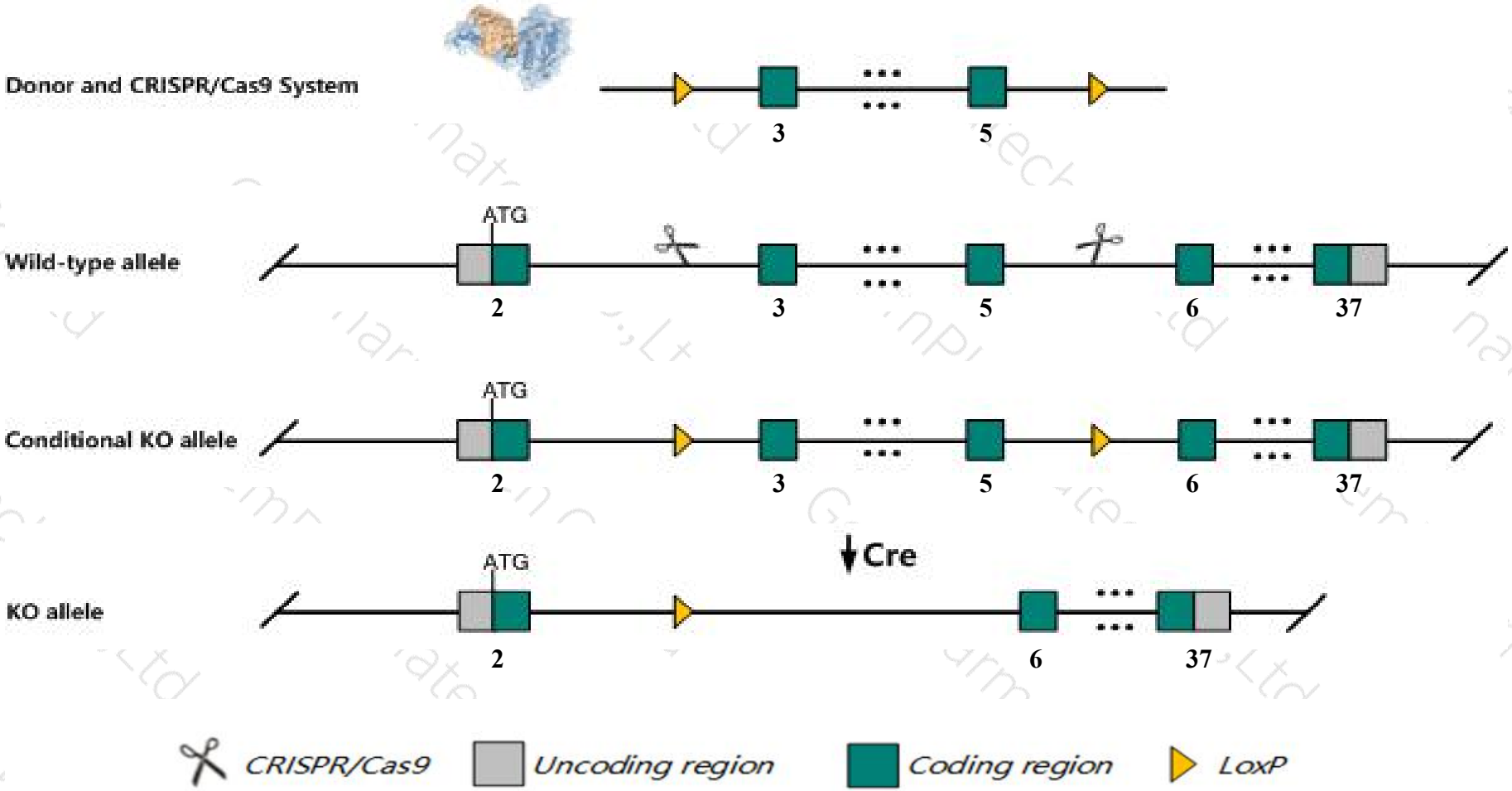
Project Overview

Project Name	***Ulk4***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Ulk4* gene. The schematic diagram is as follows:



Technical routes

- The *Ulk4* gene has 10 transcripts. According to the structure of *Ulk4* gene, exon3-exon5 of *Ulk4-209* (ENSMUST00000171923.7) transcript is recommended as the knockout region.The region contains 403bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Ulk4* 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,Homozygotes for a null allele show reduced body size, hydrocephaly, dilated brain ventricles, otitis media, and premature death. Hypomorphic mice show partial corpus callosum aplasia, hydrocephaly, subcommissural organ and ependymal motile ciliary defects, aqueduct stenosis, and impaired CSF flow.

- The *Ulk4* gene is located on the Chr9. 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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Ulk4 unc-51-like kinase 4 [Mus musculus (house mouse)]

Gene ID: 209012, updated on 31-Jan-2019

Summary

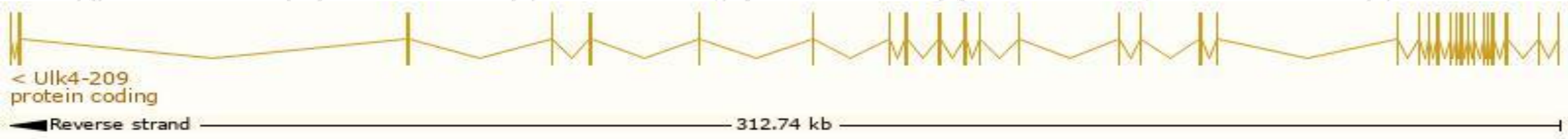
Official Symbol	Ulk4 provided by MGI
Official Full Name	unc-51-like kinase 4 provided by MGI
Primary source	MGI:MGI:1921622
See related	Ensembl:ENSMUSG00000040936
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	4932415A06Rik, A730098P15
Expression	Biased expression in testis adult (RPKM 56.7) and ovary adult (RPKM 3.4) See more
Orthologs	human all

Transcript information（Ensembl）

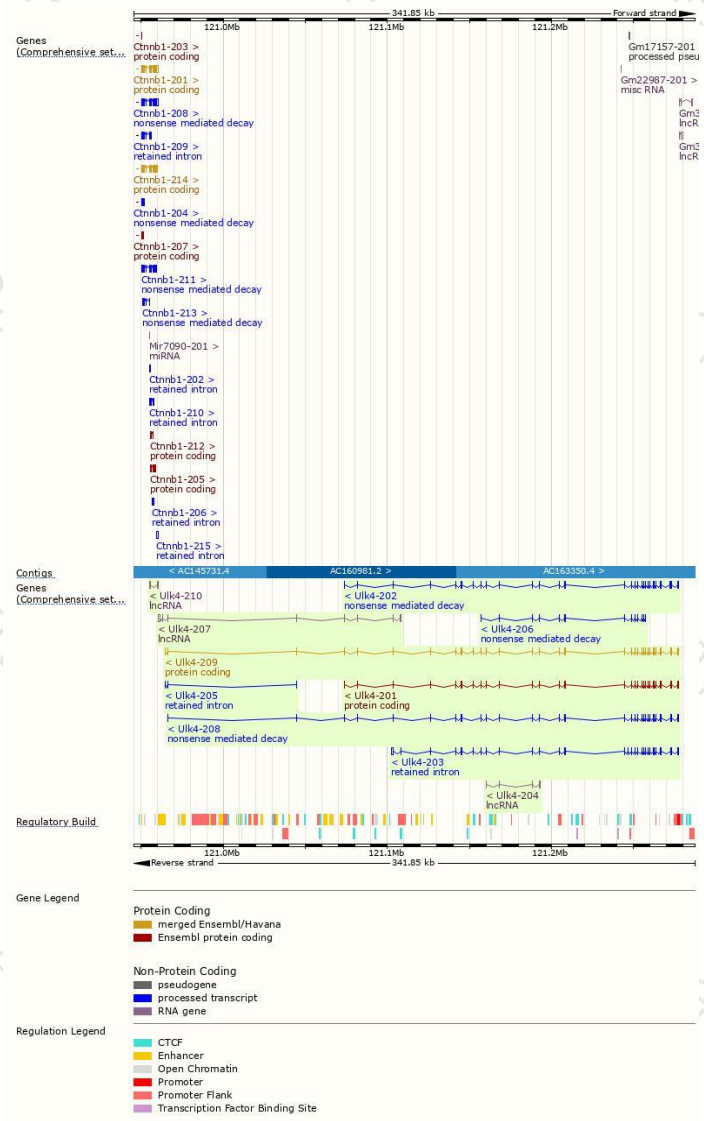
The gene has 10 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Ulk4-209	ENSMUST00000171923.7	4103	1275aa	Protein coding	CCDS52967	E9Q2P5	TSL:5 GENCODE basic APPRIS P2
Ulk4-201	ENSMUST00000051479.12	3898	1188aa	Protein coding	-	E9QKJ7	TSL:1 GENCODE basic APPRIS ALT2
Ulk4-202	ENSMUST00000051565.12	4200	54aa	Nonsense mediated decay	-	H7BX20	TSL:1
Ulk4-208	ENSMUST00000171061.7	3900	910aa	Nonsense mediated decay	-	Q3V129	TSL:5
Ulk4-206	ENSMUST00000170237.7	1751	139aa	Nonsense mediated decay	-	E9Q220	TSL:1
Ulk4-203	ENSMUST00000164336.7	4629	No protein	Retained intron	-	-	TSL:1
Ulk4-205	ENSMUST00000169176.1	528	No protein	Retained intron	-	-	TSL:3
Ulk4-207	ENSMUST00000170406.7	2639	No protein	lncRNA	-	-	TSL:1
Ulk4-210	ENSMUST00000213408.1	759	No protein	lncRNA	-	-	TSL:3
Ulk4-204	ENSMUST00000164969.1	546	No protein	lncRNA	-	-	TSL:3

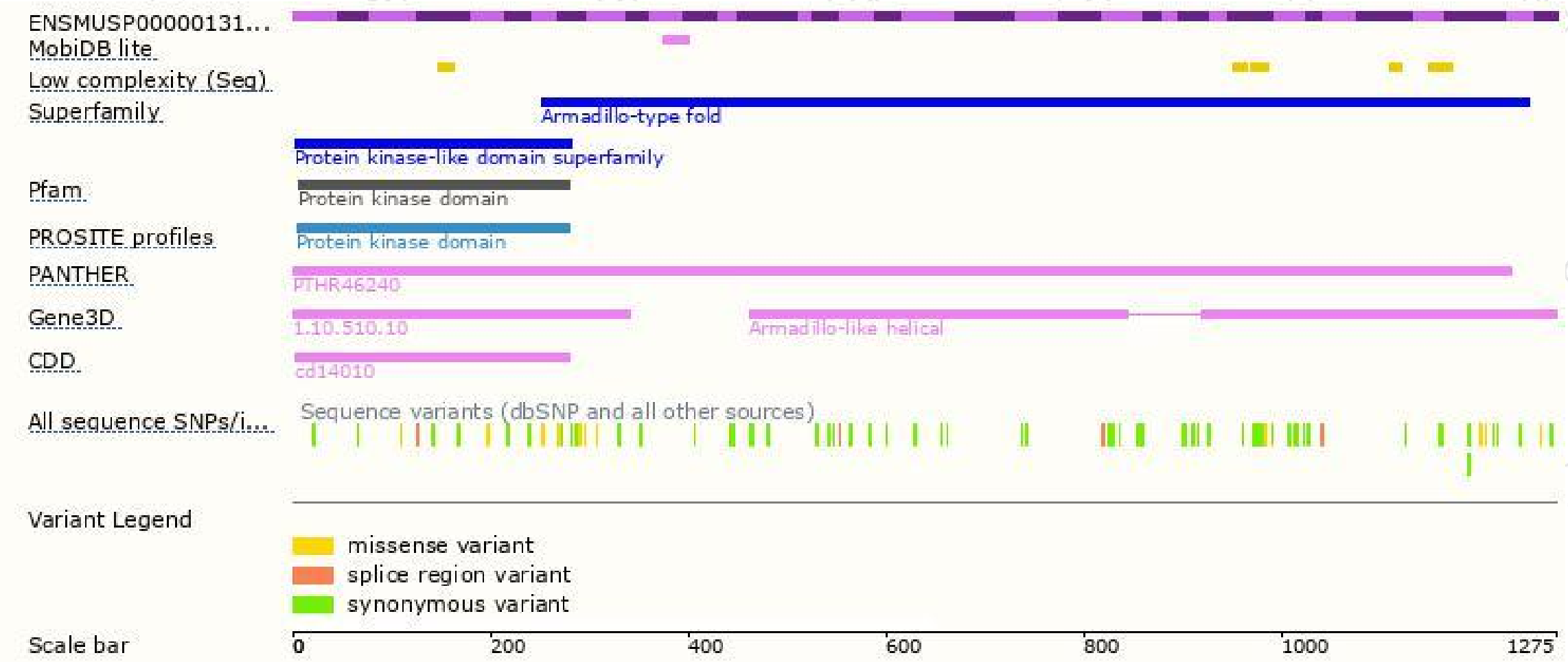
The strategy is based on the design of *Ulk4-209* transcript,The transcription is shown below



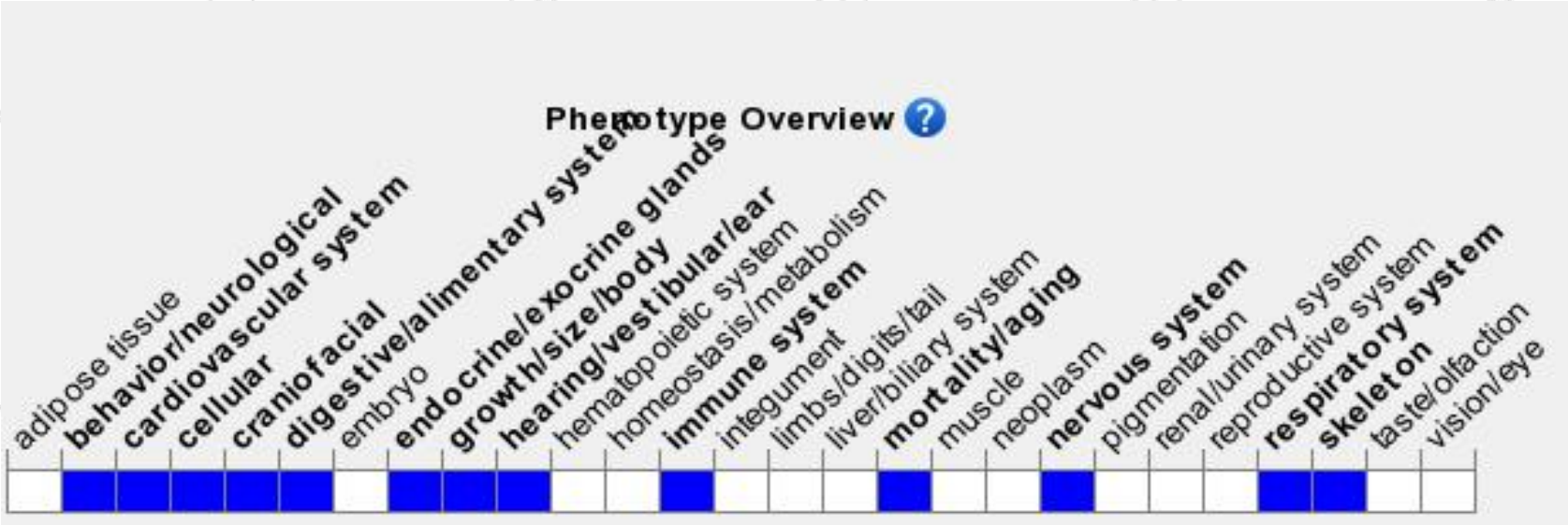
Genomic location distribution



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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