Akt3 Cas9-CKO Strategy

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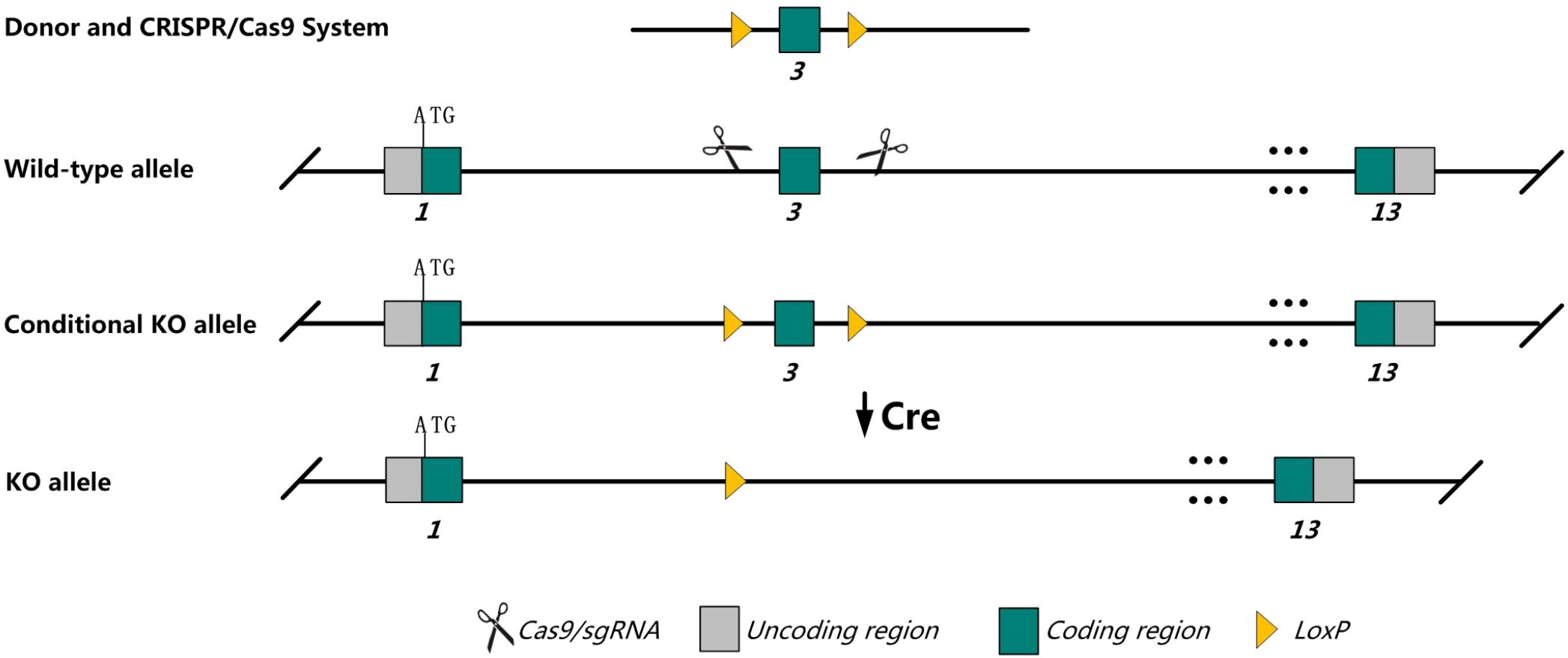
Project Overview

Project Name	***Akt3***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Akt3* gene. The schematic diagram is as follows:



Technical routes

- The *Akt3* gene has 4 transcripts. According to the structure of *Akt3* gene, exon3 of *Akt3-203* (ENSMUST00000111160.8) transcript is recommended as the knockout region.The region contains 112bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Akt3* 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,Homozygous null mice exhibit a 20% decrease in brain size and have smaller and fewer cells in the brain. Mice heterozygous for an ENU-induced mutation exhibit increased seizures (sporadic and induced) and increased brain weight and size.

- The *Akt3* gene is located on the Chr1. 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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Akt3 thymoma viral proto-oncogene 3 [Mus musculus (house mouse)]

Gene ID: 23797, updated on 7-Apr-2019

Summary

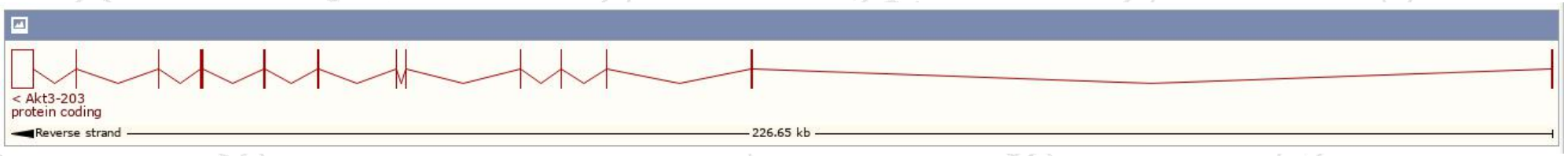
Official Symbol	Akt3 provided by MGI
Official Full Name	thymoma viral proto-oncogene 3 provided by MGI
Primary source	MGI:MGI:1345147
See related	Ensembl:ENSMUSG00000019699
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	AI851531, D930002M15Rik, Nmf350
Expression	Broad expression in CNS E18 (RPKM 12.2), CNS E14 (RPKM 10.5) and 22 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

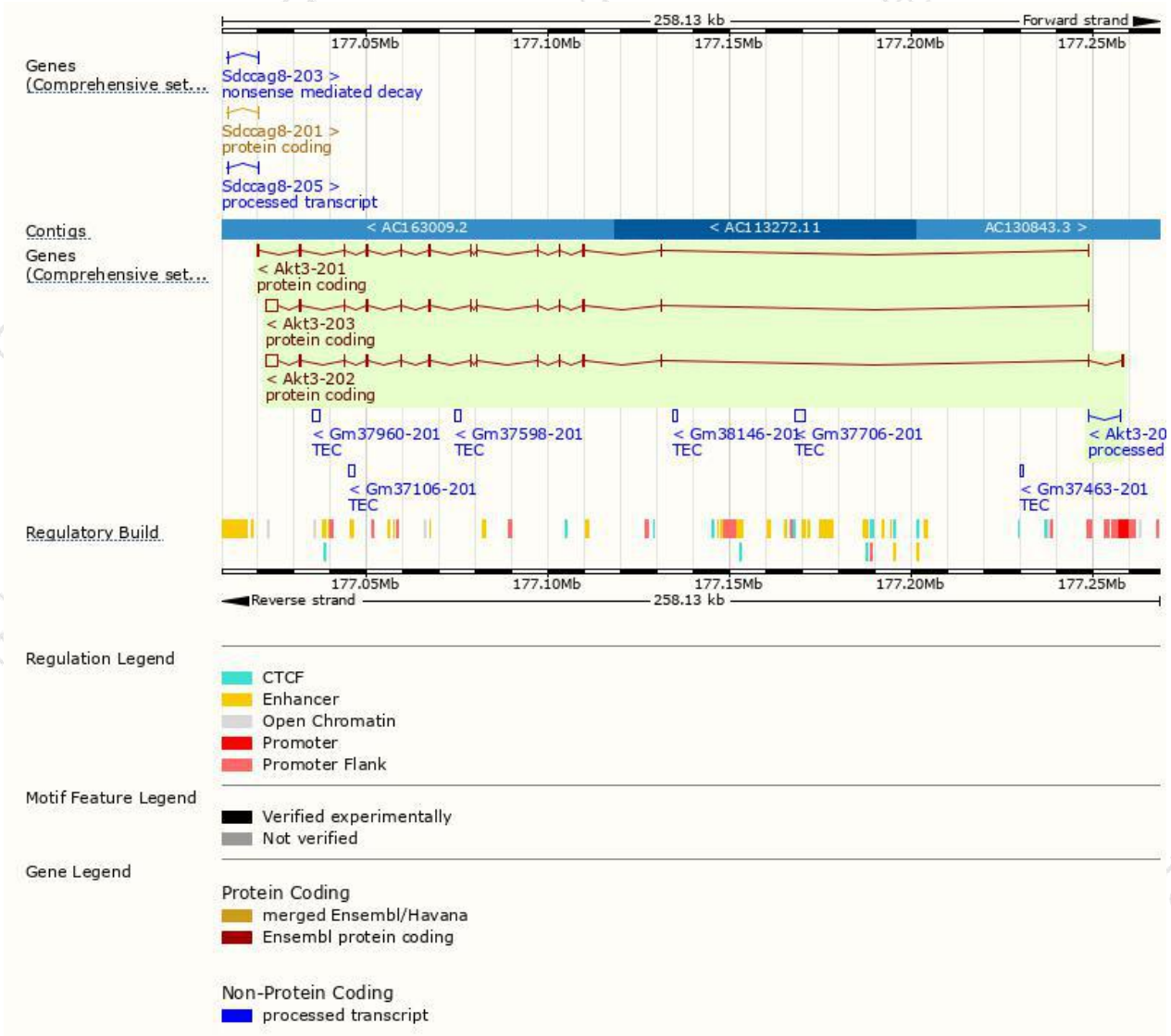
The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Akt3-202	ENSMUST00000111159.1	4906	479aa	Protein coding	CCDS35799	Q9WUA6	TSL:5 GENCODE basic APPRIS P1
Akt3-203	ENSMUST00000111160.8	4735	479aa	Protein coding	CCDS35799	Q9WUA6	TSL:1 GENCODE basic APPRIS P1
Akt3-201	ENSMUST00000019843.14	1511	470aa	Protein coding	-	Q9WUA6	TSL:5 GENCODE basic
Akt3-204	ENSMUST00000211158.1	249	No protein	Processed transcript	-	-	TSL:5

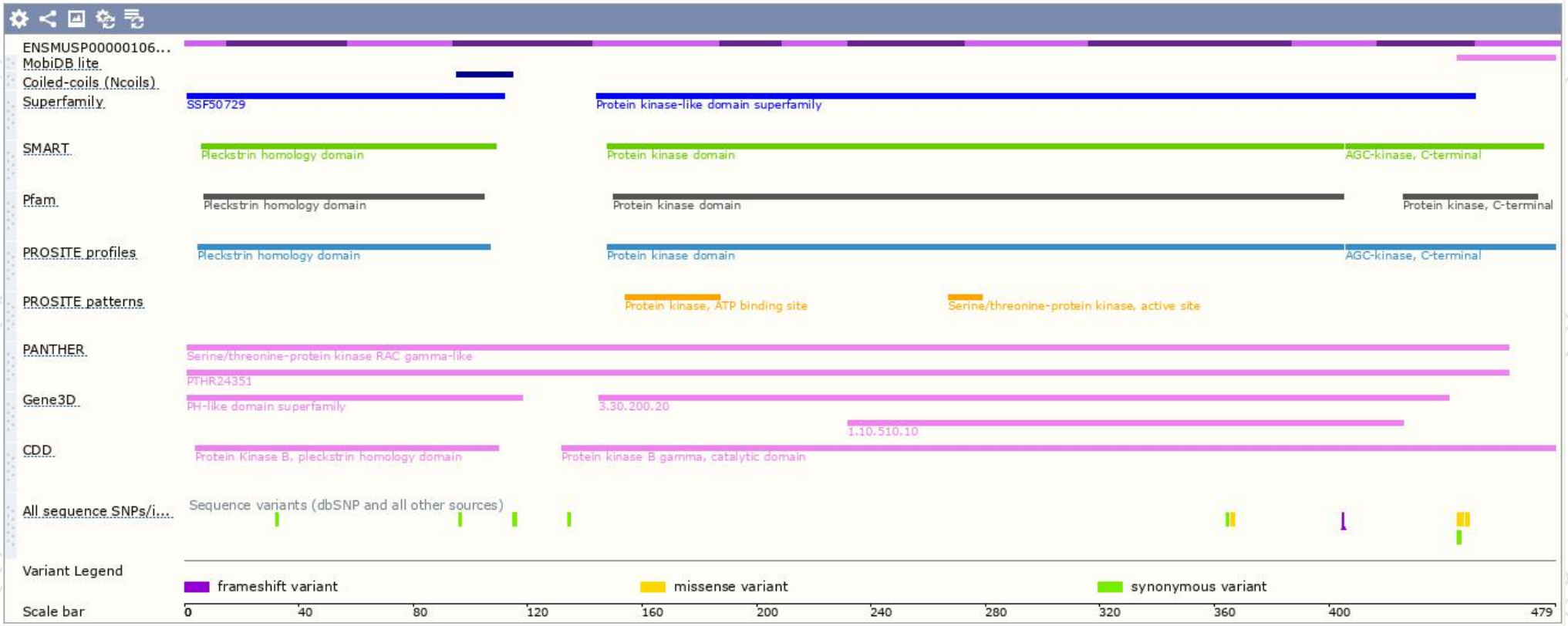
The strategy is based on the design of *Akt3-203* transcript,The transcription is shown below



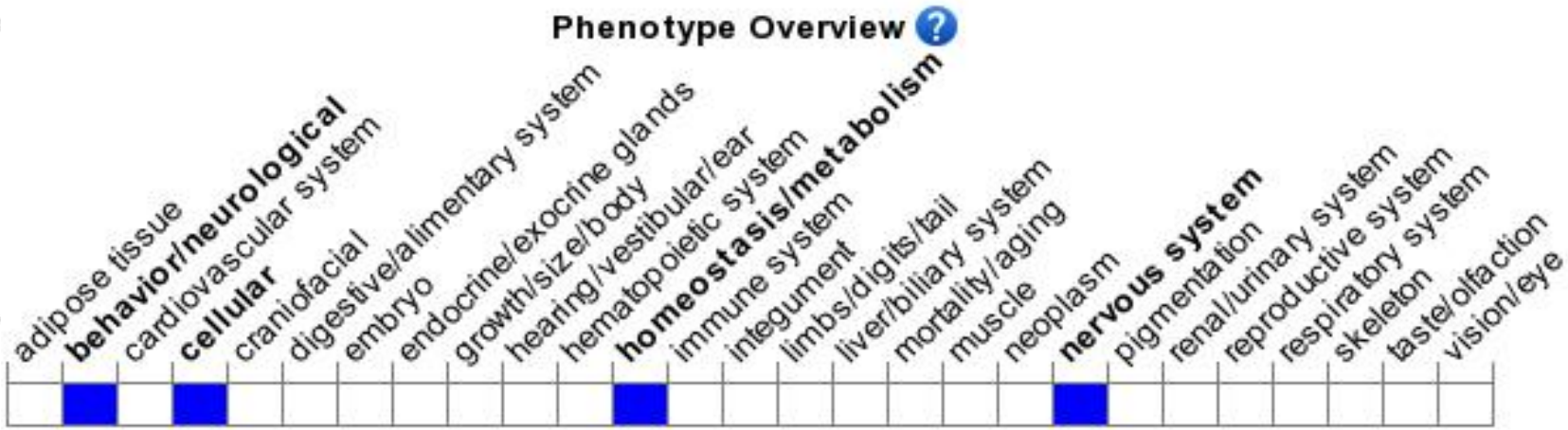
Genomic location distribution



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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