Axin1 Cas9-CKO Strategy

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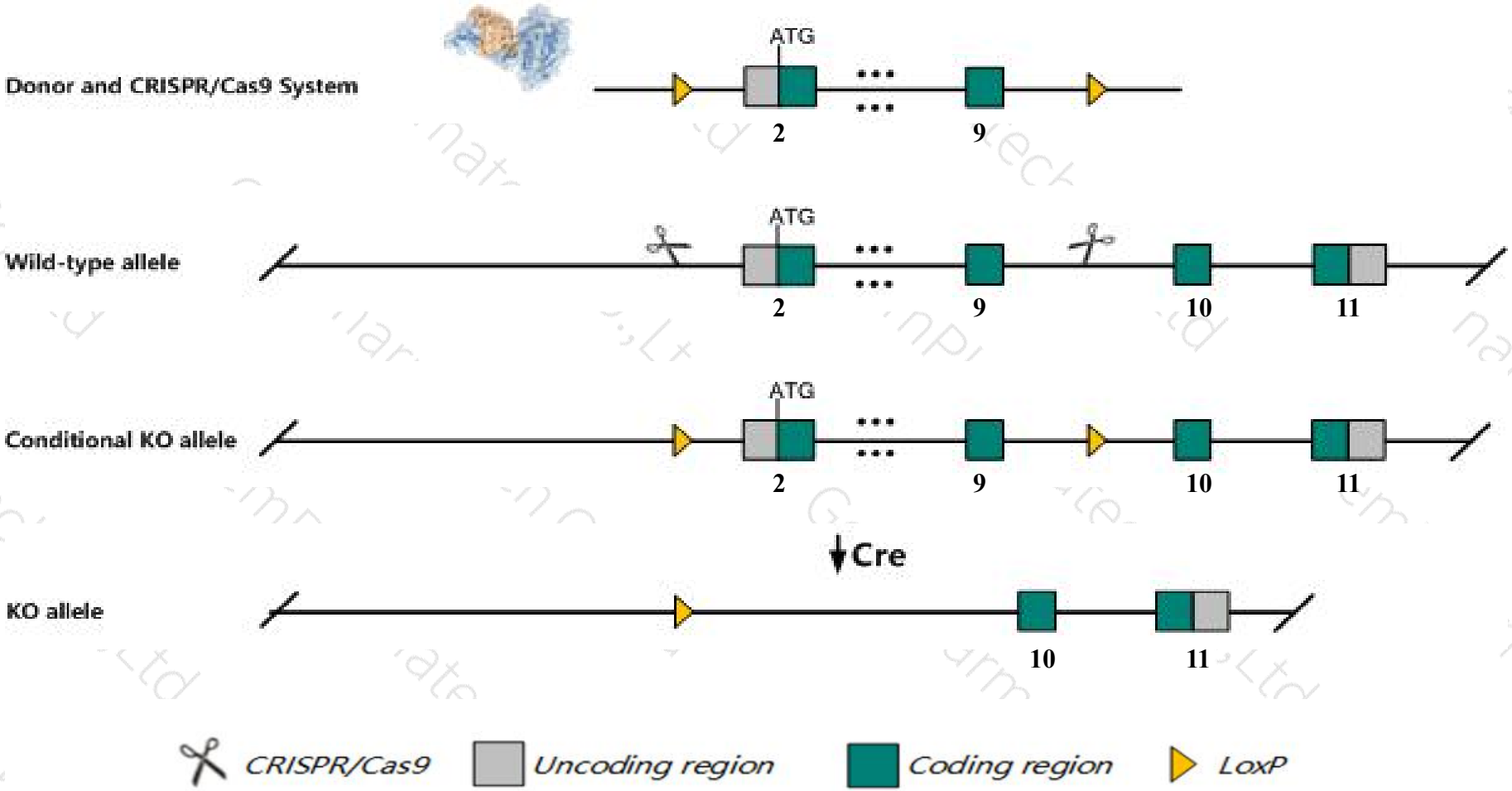
Project Overview

Project Name	***Axin1***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Axin1* gene. The schematic diagram is as follows:



Technical routes

- The *Axin1* gene has 5 transcripts. According to the structure of *Axin1* gene, exon2-exon9 of *Axin1-201* (ENSMUST00000074370.9) transcript is recommended as the knockout region.The region contains start codon ATG. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Axin1* 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,Mutant homozygotes die at embryonic day 8-10, exhibiting neuroectodermal defects and axial duplications. Heterozygotes exhibit skeletal, cardiac, and neurological defects including short, bent tails, and deafness with circling behavior.

➢ The *Axin1* gene is located on the Chr17. 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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Axin1 axin 1 [Mus musculus (house mouse)]

Gene ID: 12005, updated on 19-Mar-2019

Summary

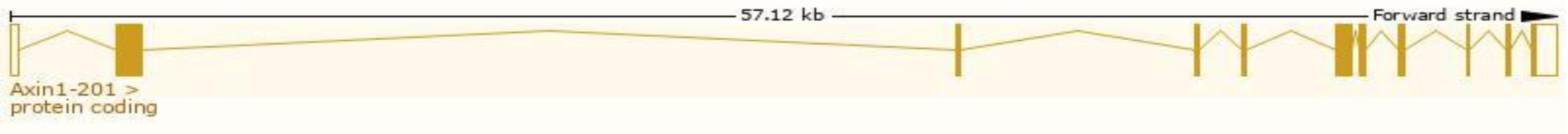
Official Symbol	Axin1 provided by MGI
Official Full Name	axin 1 provided by MGI
Primary source	MGI:MGI:1096327
See related	Ensembl:ENSMUSG00000024182
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	AI316800, Axin, Fu, Kb, Ki, fused, kinky, knobbly
Expression	Ubiquitous expression in thymus adult (RPKM 11.6), CNS E11.5 (RPKM 10.8) and 28 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

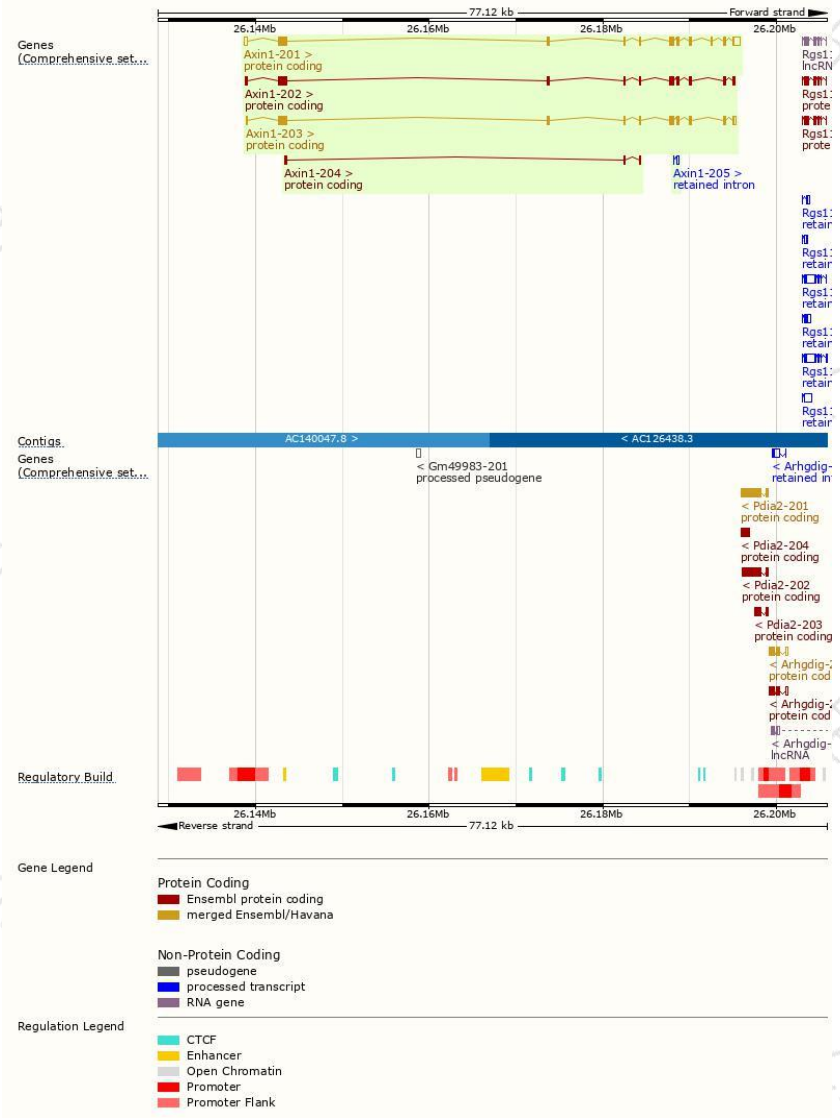
The gene has 5 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Axin1-201	ENSMUST00000074370.9	3777	868aa	Protein coding	CCDS28547	E9QMJ8	TSL:1 GENCODE basic APPRIS P3
Axin1-203	ENSMUST00000163421.7	2890	832aa	Protein coding	CCDS50042	Q14DJ8	TSL:5 GENCODE basic APPRIS ALT2
Axin1-202	ENSMUST00000118904.8	2833	832aa	Protein coding	CCDS50042	Q14DJ8	TSL:1 GENCODE basic APPRIS ALT2
Axin1-204	ENSMUST00000168282.2	465	155aa	Protein coding	-	F6SKQ8	5' and 3' truncations in transcript evidence prevent annotation of the start and the end of the CDS. CDS 5' and 3' incomplete TSL:3
Axin1-205	ENSMUST00000169268.1	291	No protein	Retained intron	-	-	TSL:2

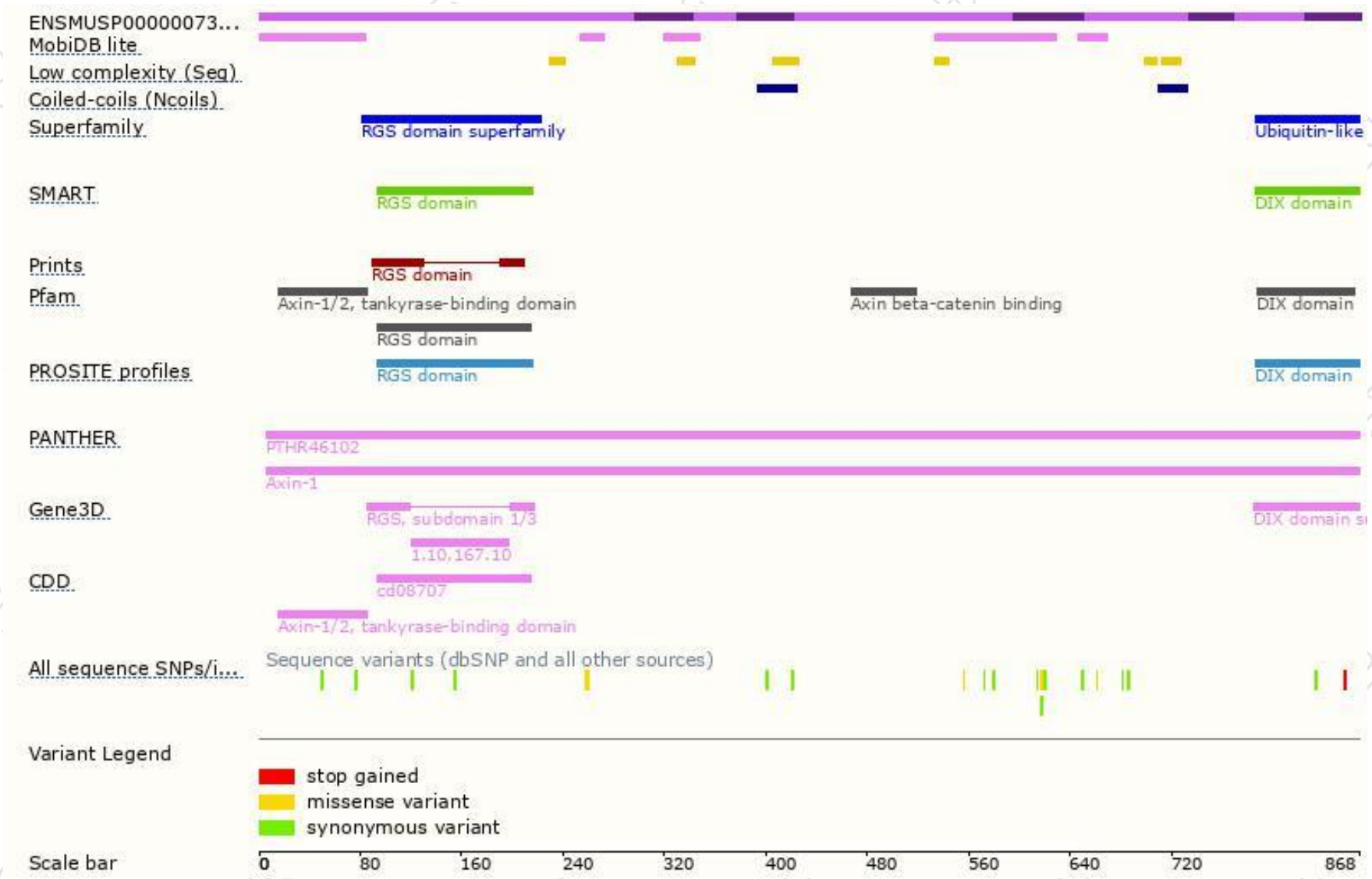
The strategy is based on the design of *Axin1-201* transcript,The transcription is shown below



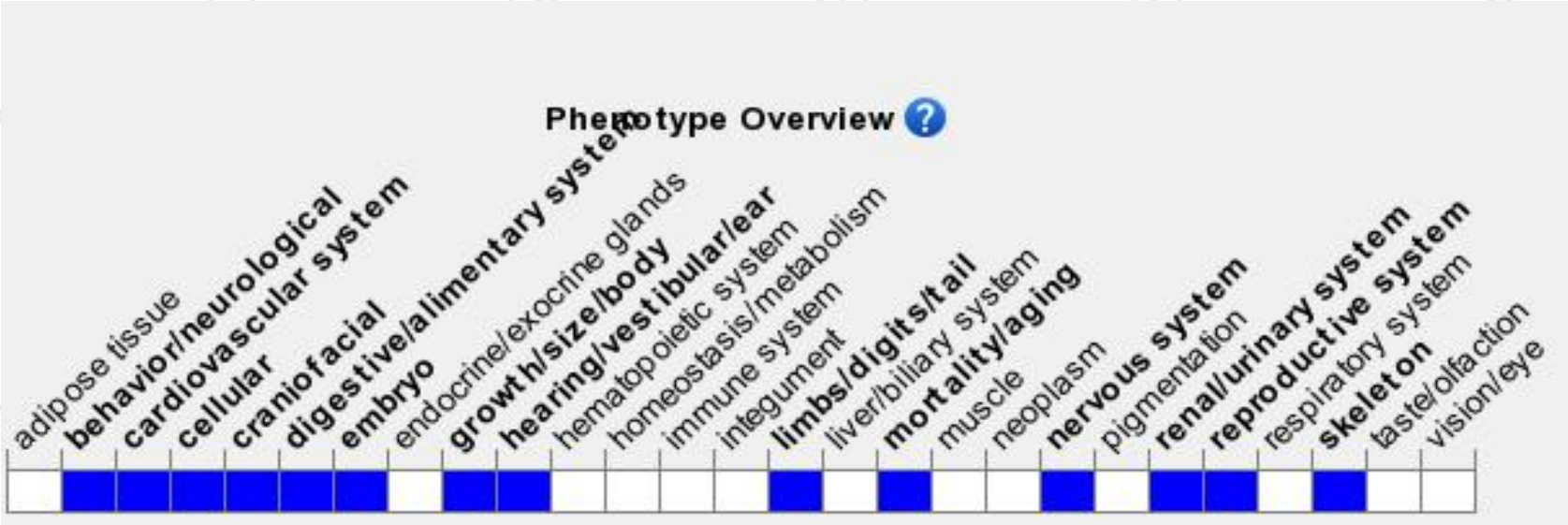
Genomic location distribution



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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