Kif21b Cas9-CKO Strategy

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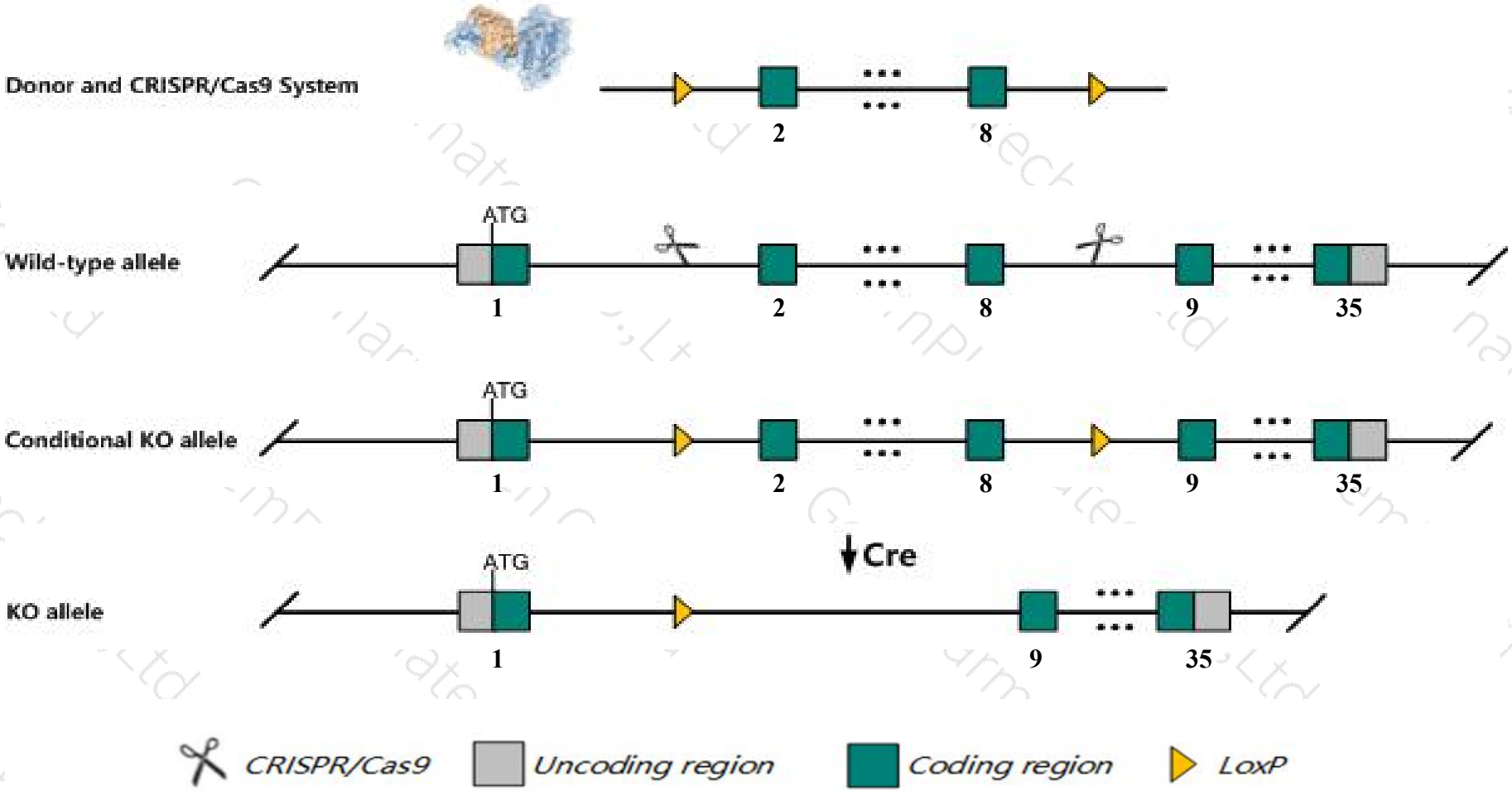
Project Overview

Project Name	***Kif21b***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Kif21b* gene. The schematic diagram is as follows:



Technical routes

- The *Kif21b* gene has 6 transcripts. According to the structure of *Kif21b* gene, exon2-exon8 of *Kif21b-201* (ENSMUST00000075164.10) transcript is recommended as the knockout region.The region contains 1174bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Kif21b* 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 KO reduces dendrite branching and spine density as a result of reduced microtubule growth, resulting in impaired spatial learning and cued conditioning behavior.

➢ The *Kif21b* 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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Kif21b kinesin family member 21B [Mus musculus (house mouse)]

Gene ID: 16565, updated on 19-Mar-2019

Summary

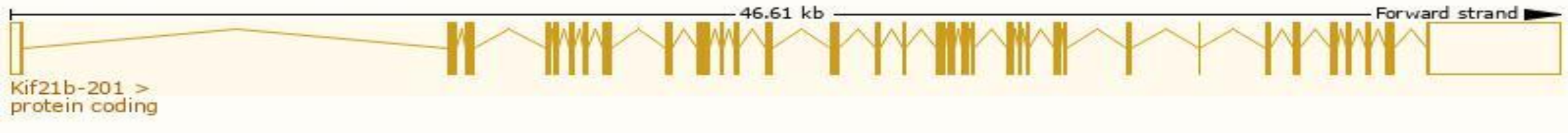
Official Symbol	Kif21b provided by MGI
Official Full Name	kinesin family member 21B provided by MGI
Primary source	MGI:MGI:109234
See related	Ensembl:ENSMUSG00000041642
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	2610511N21Rik, mKIAA0449
Expression	Broad expression in thymus adult (RPKM 74.1), whole brain E14.5 (RPKM 48.8) and 15 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

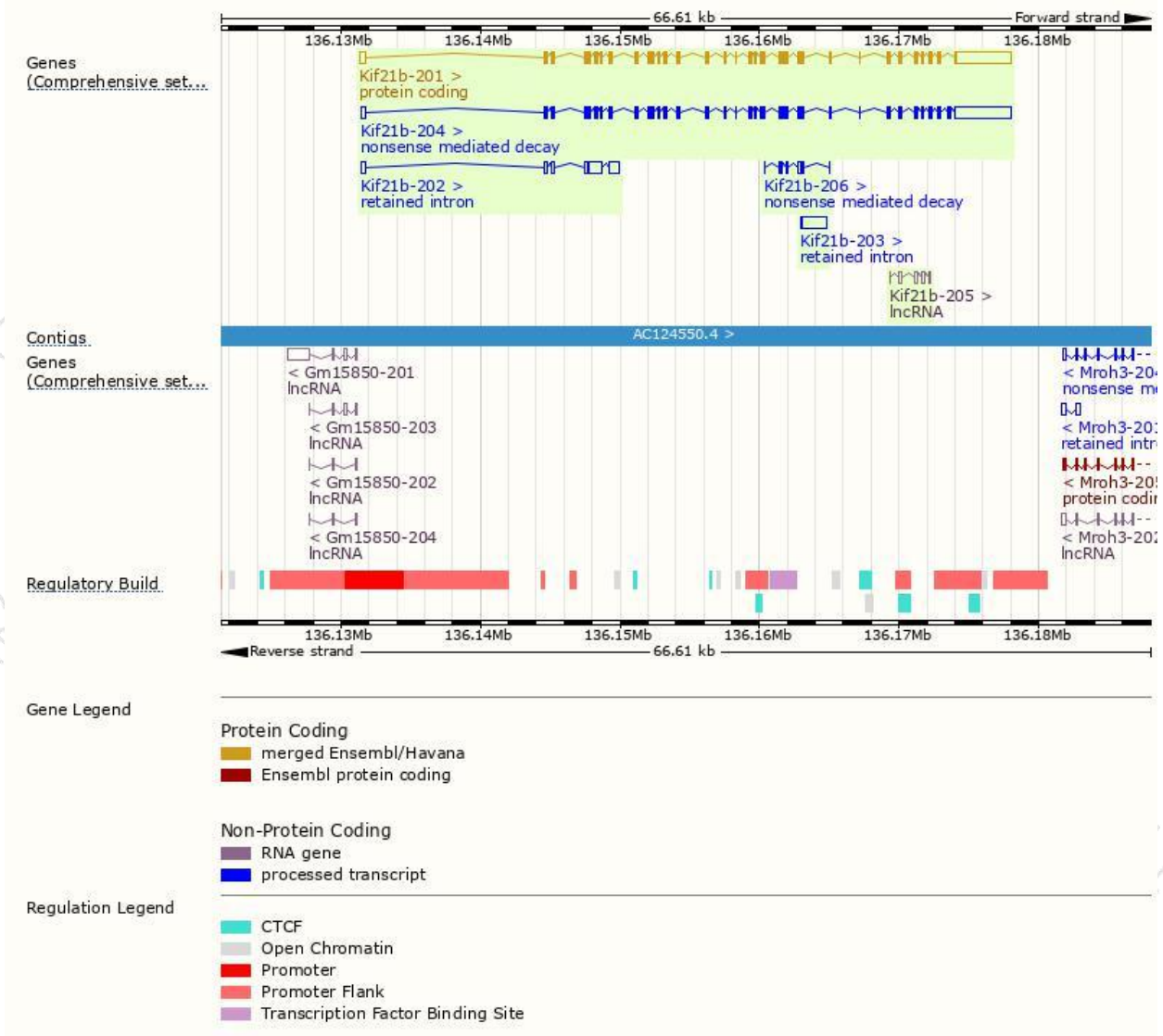
The gene has 6 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Kif21b-201	ENSMUST00000075164.10	9115	1624aa	Protein coding	CCDS15324	F8VQE2	TSL:2 GENCODE basic APPRIS P1
Kif21b-204	ENSMUST00000130864.8	9254	1639aa	Nonsense mediated decay	-	E9Q0A4	TSL:1
Kif21b-206	ENSMUST00000171381.1	583	78aa	Nonsense mediated decay	-	F6ZSF2	CDS 5' incomplete TSL:5
Kif21b-202	ENSMUST00000122892.1	2606	No protein	Retained intron	-	-	TSL:1
Kif21b-203	ENSMUST00000127624.2	1802	No protein	Retained intron	-	-	TSL:2
Kif21b-205	ENSMUST00000165333.1	701	No protein	lncRNA	-	-	TSL:5

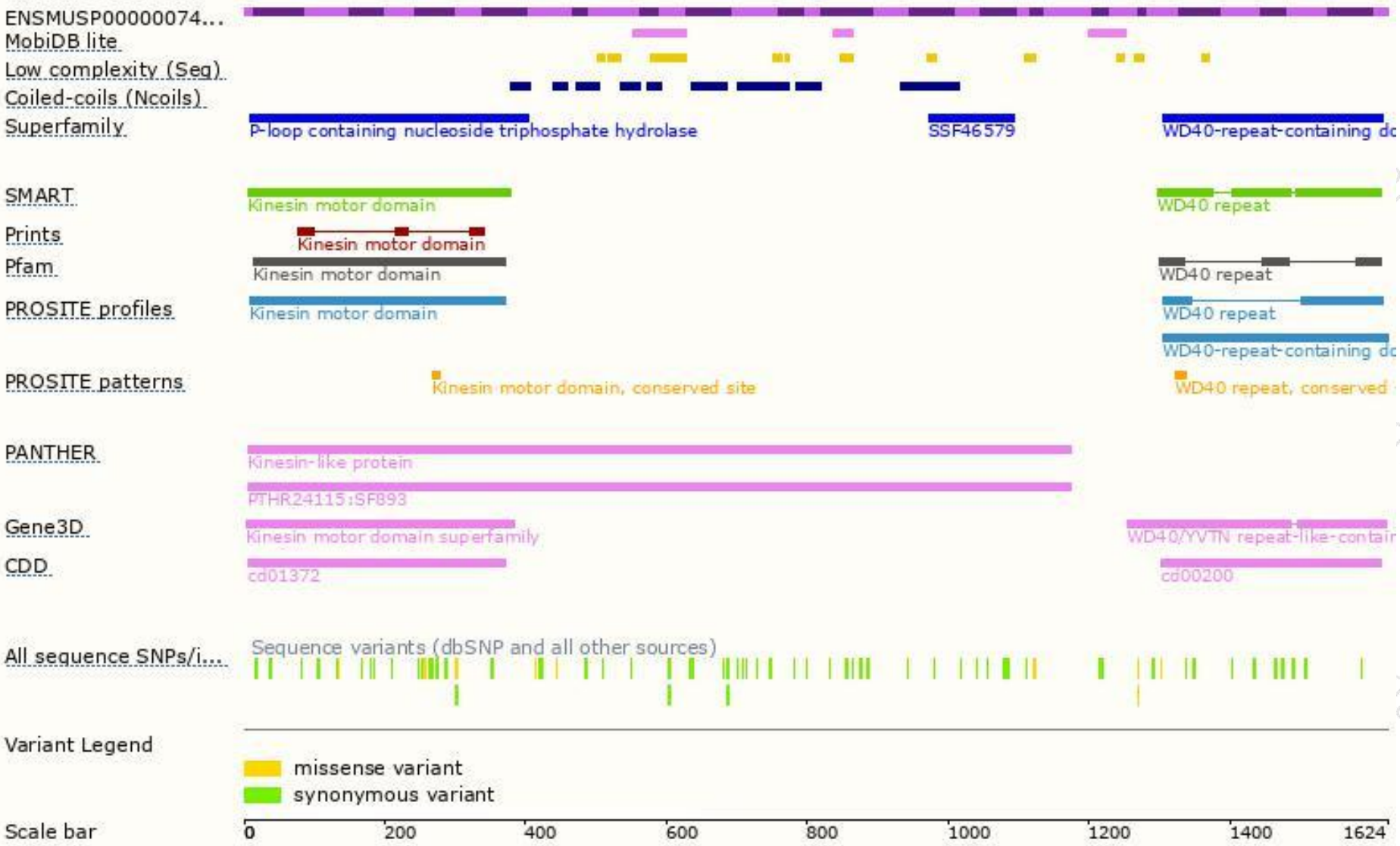
The strategy is based on the design of *Kif21b-201* transcript,The transcription is shown below



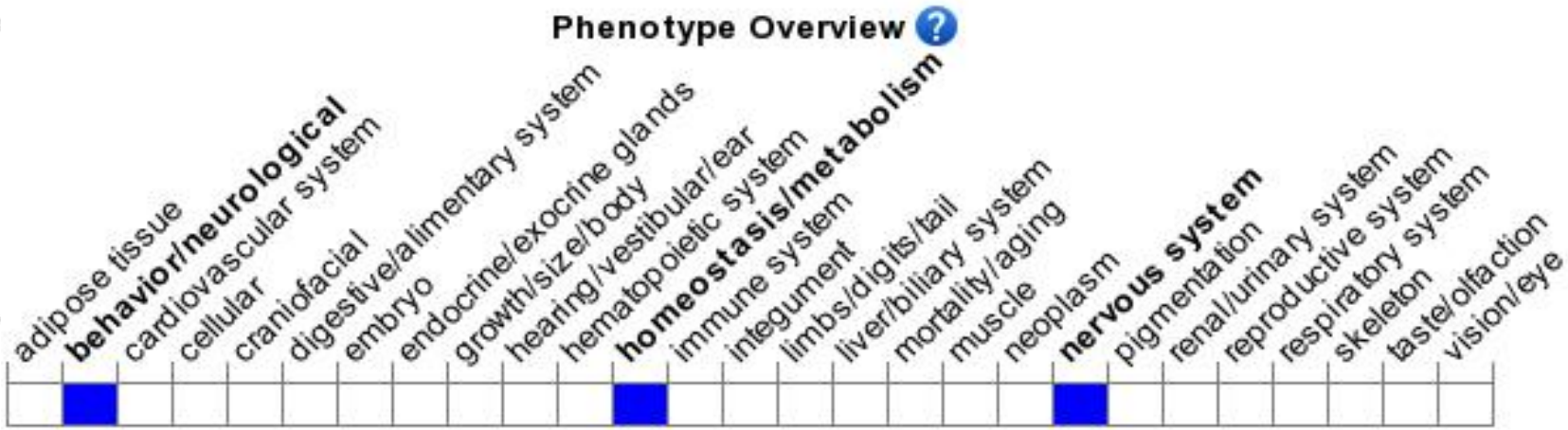
Genomic location distribution



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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