

Dnal1 Cas9-KO Strategy

Designer:

Lixin Lv

Reviewer:

Lingyan Wu

Design Date:

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Project Overview

Project Name

Dnal1

Project type

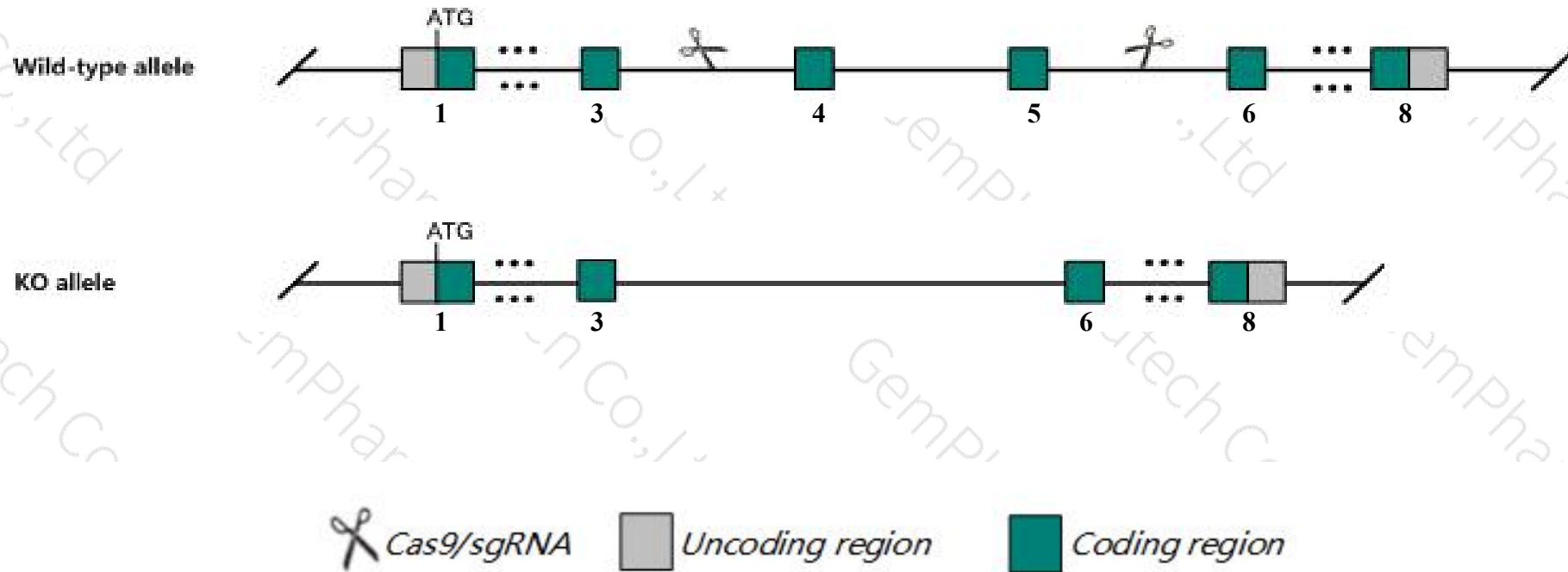
Cas9-KO

Strain background

C57BL/6J

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Dnal1* gene. The schematic diagram is as follows:



- The *Dnal1* gene has 7 transcripts. According to the structure of *Dnal1* gene, exon4-exon5 of *Dnal1*-202 (ENSMUST00000123491.7) 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 *Dnal1* gene. The brief process is as follows: sgRNA was transcribed in vitro. Cas9 and sgRNA were microinjected into the fertilized eggs of C57BL/6J 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/6J mice.

- The *Dnal1* gene is located on the Chr12. 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 the gene knockout on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

Gene information (NCBI)

Dnal1 dynein, axonemal, light chain 1 [*Mus musculus* (house mouse)]

Gene ID: 105000, updated on 12-Aug-2019

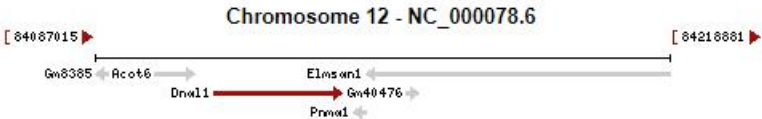
Summary

Official Symbol Dnal1 provided by [MGI](#)
Official Full Name dynein, axonemal, light chain 1 provided by [MGI](#)
Primary source [MGI:MGI:1921462](#)
See related [Ensembl:ENSMUSG00000042523](#)
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 Dnalc1; AW121714; 1700010H15Rik; E330027P08Rik
Expression Broad expression in frontal lobe adult (RPKM 11.8), cortex adult (RPKM 9.6) and 17 other tissues [See more](#)
Orthologs [human](#) [all](#)

Genomic context

Location: 12; 12 D1 [See Dnal1 in Genome Data Viewer](#)
Exon count: 8

Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	12	NC_000078.6 (84114279..84143517)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	12	NC_000078.5 (85455278..85484467)



Transcript information (Ensembl)

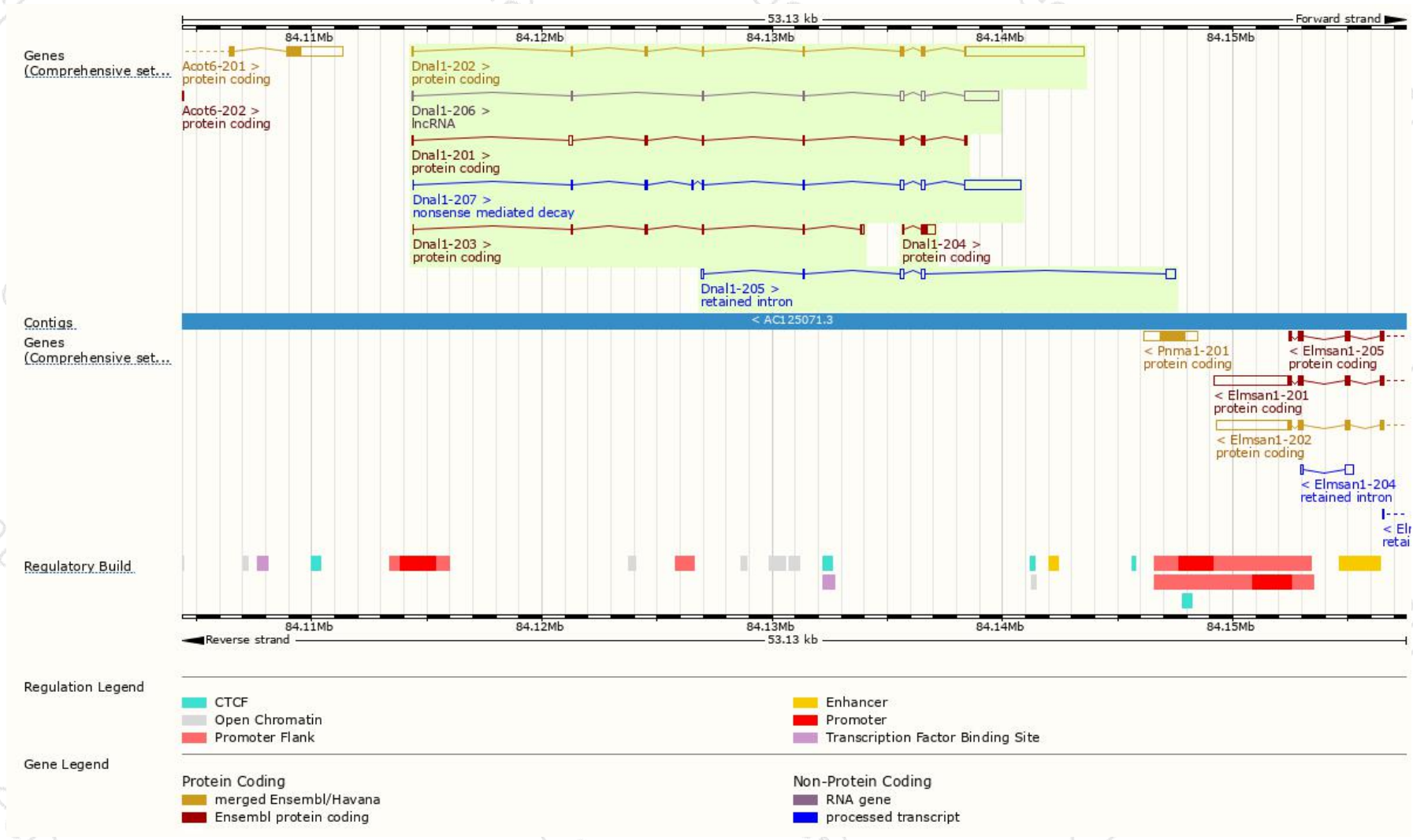
The gene has 7 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Dnal1-202	ENSMUST00000123491.7	5727	190aa	Protein coding	CCDS26039	Q05A62	TSL:2 GENCODE basic APPRIS P1
Dnal1-201	ENSMUST00000046340.8	790	151aa	Protein coding	CCDS83987	Q05A62	TSL:1 GENCODE basic
Dnal1-204	ENSMUST00000140812.1	637	81aa	Protein coding	-	D3YTL1	CDS 5' incomplete TSL:5
Dnal1-203	ENSMUST00000136159.1	403	103aa	Protein coding	-	D3YYU7	TSL:5 GENCODE basic
Dnal1-207	ENSMUST00000156138.7	3021	73aa	Nonsense mediated decay	-	D6RHN1	TSL:5
Dnal1-205	ENSMUST00000143711.1	818	No protein	Retained intron	-	-	TSL:3
Dnal1-206	ENSMUST00000143753.7	1938	No protein	lncRNA	-	-	TSL:5

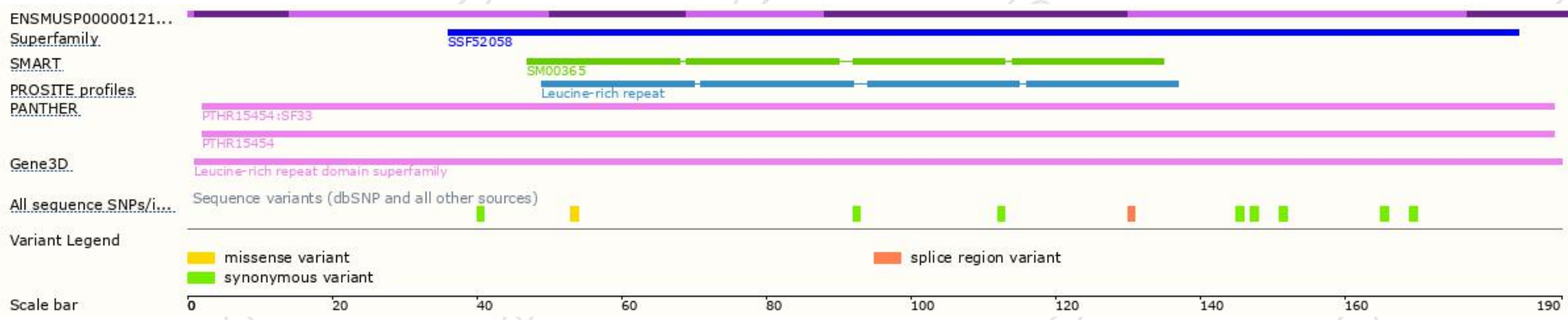
The strategy is based on the design of *Dnal1-202* transcript,The transcription is shown below



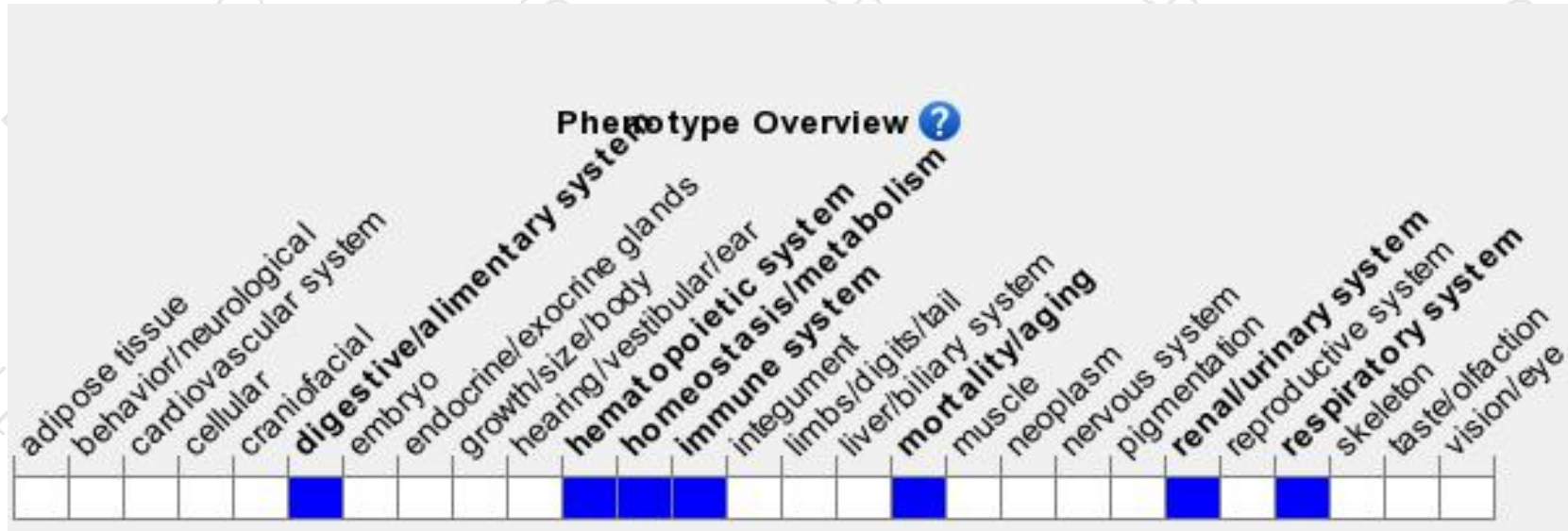
Genomic location distribution



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/>).

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

Tel: 025-5864 1534

