

# *Dynll1* Cas9-CKO Strategy

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**Reviewer: Shilei Zhu**

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# Project Overview

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**Project Name**

***Dynll1***

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**Project type**

**Cas9-CKO**

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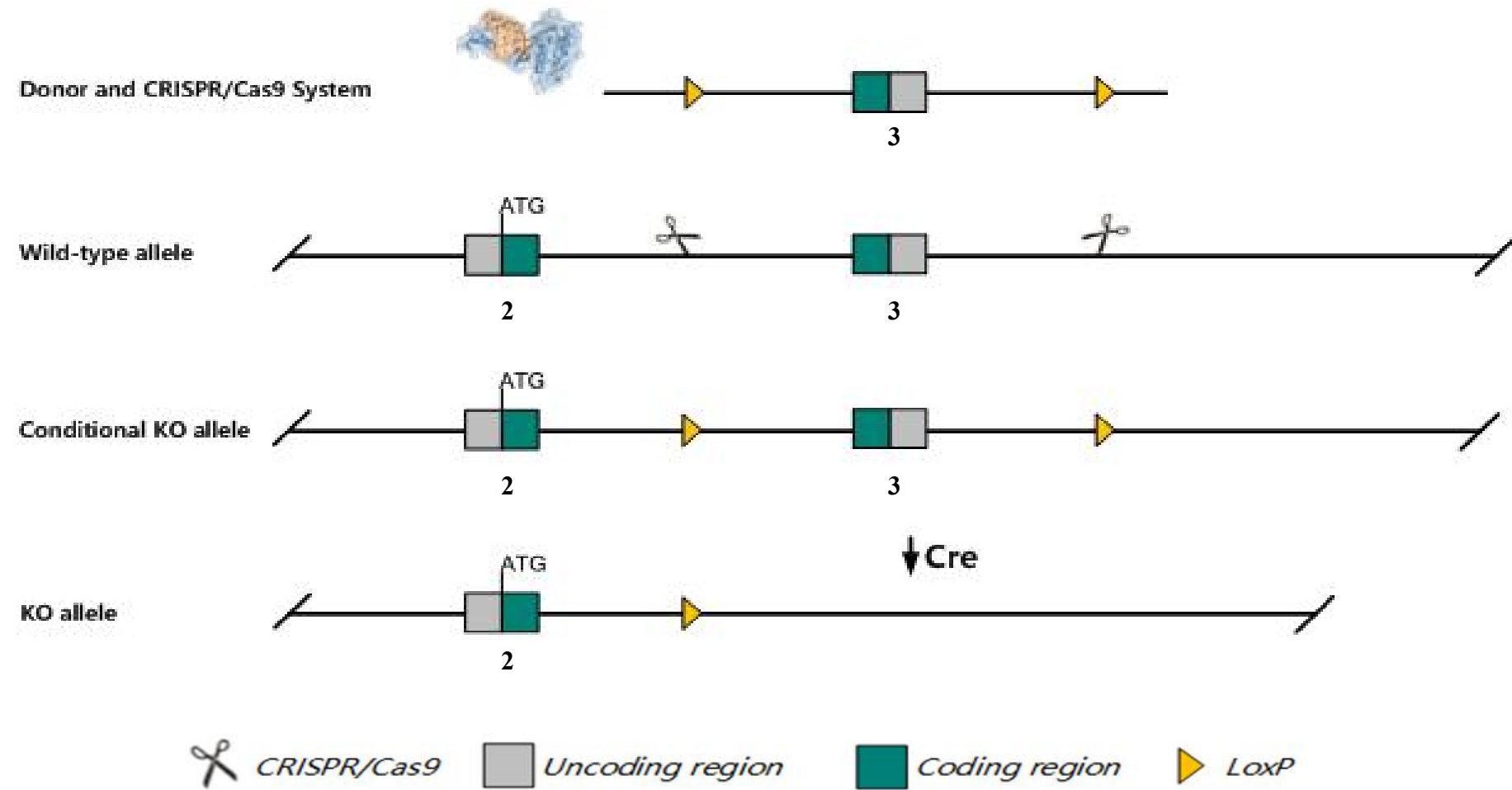
**Strain background**

**C57BL/6JGpt**

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# Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Dynl1* gene. The schematic diagram is as follows:



The *Dynll1* gene has 6 transcripts. According to the structure of *Dynll1* gene, exon3 of *Dynll1-201*(ENSMUST00000009157.3) transcript is recommended as the knockout region. The region contains 138bp coding sequence. Knock out the region will result in disruption of protein function.

In this project we use CRISPR/Cas9 technology to modify *Dynll1* 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.

According to the existing MGI data, mice carrying a knock-out mutation of this gene exhibit preweaning lethality. Mice homozygous for a gene trap allele exhibit heterotaxia, small or absent lungs and abnormal cilia.

The KO region contains functional region of the *Dynll1* gene. Knockout the region may affect the function of *Coq5* gene.

The *Dynll1* gene is located on the Chr5. 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.

**Dynll1 dynein light chain LC8-type 1 [Mus musculus (house mouse)]**

Gene ID: 56455, updated on 13-Mar-2020

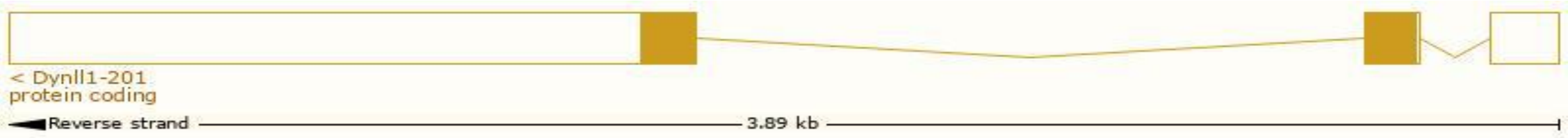
**Summary****Official Symbol** Dynll1 provided by [MGI](#)**Official Full Name** dynein light chain LC8-type 1 provided by [MGI](#)**Primary source** [MGI:MGI:1861457](#)**See related** [Ensembl:ENSMUSG000000009013](#)**Gene type** protein coding**RefSeq status** VALIDATED**Organism** [Mus musculus](#)**Lineage** Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus**Also known as** Dlc8, Dncl1, Pin**Expression** Ubiquitous expression in testis adult (RPKM 89.2), CNS E18 (RPKM 88.6) and 25 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
Dynll1-201	<a href="#">ENSMUST00000009157.3</a>	2030	<a href="#">89aa</a>	Protein coding	<a href="#">CCDS39227</a>	<a href="#">P63168</a>	TSL:1 GENCODE basic APPRIS P1
Dynll1-202	<a href="#">ENSMUST00000112090.1</a>	729	<a href="#">89aa</a>	Protein coding	<a href="#">CCDS39227</a>	<a href="#">P63168</a>	TSL:2 GENCODE basic APPRIS P1
Dynll1-203	<a href="#">ENSMUST00000123292.1</a>	539	No protein	Processed transcript	-	-	TSL:3
Dynll1-205	<a href="#">ENSMUST00000127552.1</a>	528	No protein	Processed transcript	-	-	TSL:3
Dynll1-206	<a href="#">ENSMUST00000202980.1</a>	2242	No protein	Retained intron	-	-	TSL:NA
Dynll1-204	<a href="#">ENSMUST00000125959.1</a>	478	No protein	Retained intron	-	-	TSL:2

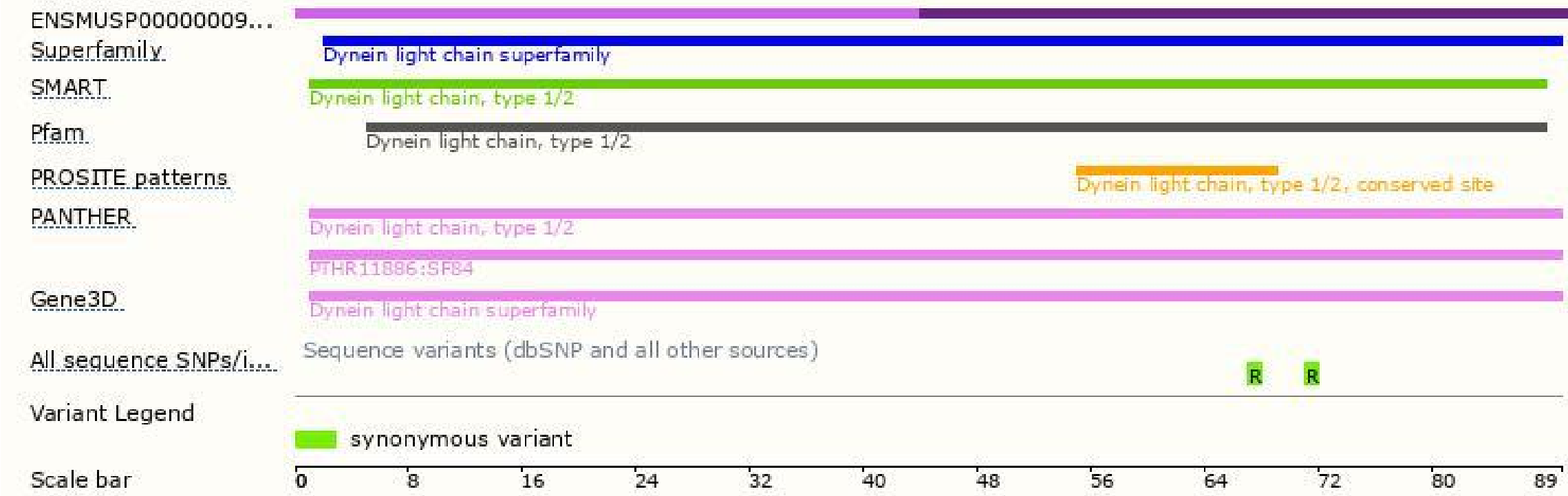
The strategy is based on the design of *Dynll1-201* transcript,the transcription is shown below:



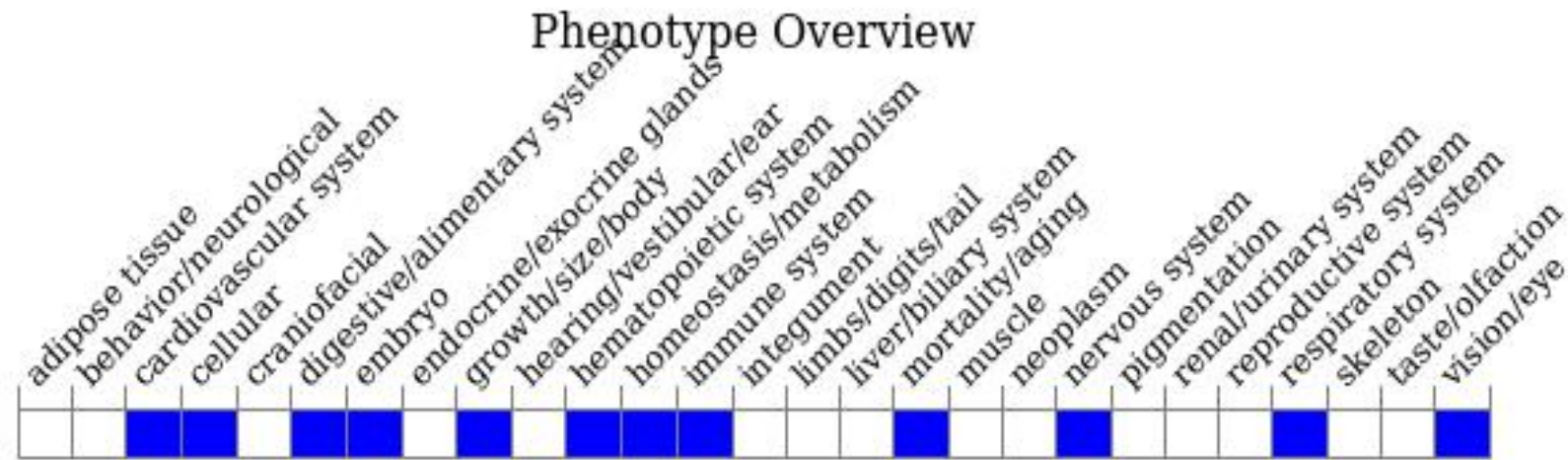
# Genomic location distribution



# 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/>).*

According to the existing MGI data, mice carrying a knock-out mutation of this gene exhibit preweaning lethality.

Mice homozygous for a gene trap allele exhibit heterotaxia, small or absent lungs and abnormal cilia.

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