Dnm1l Cas9-KO Strategy

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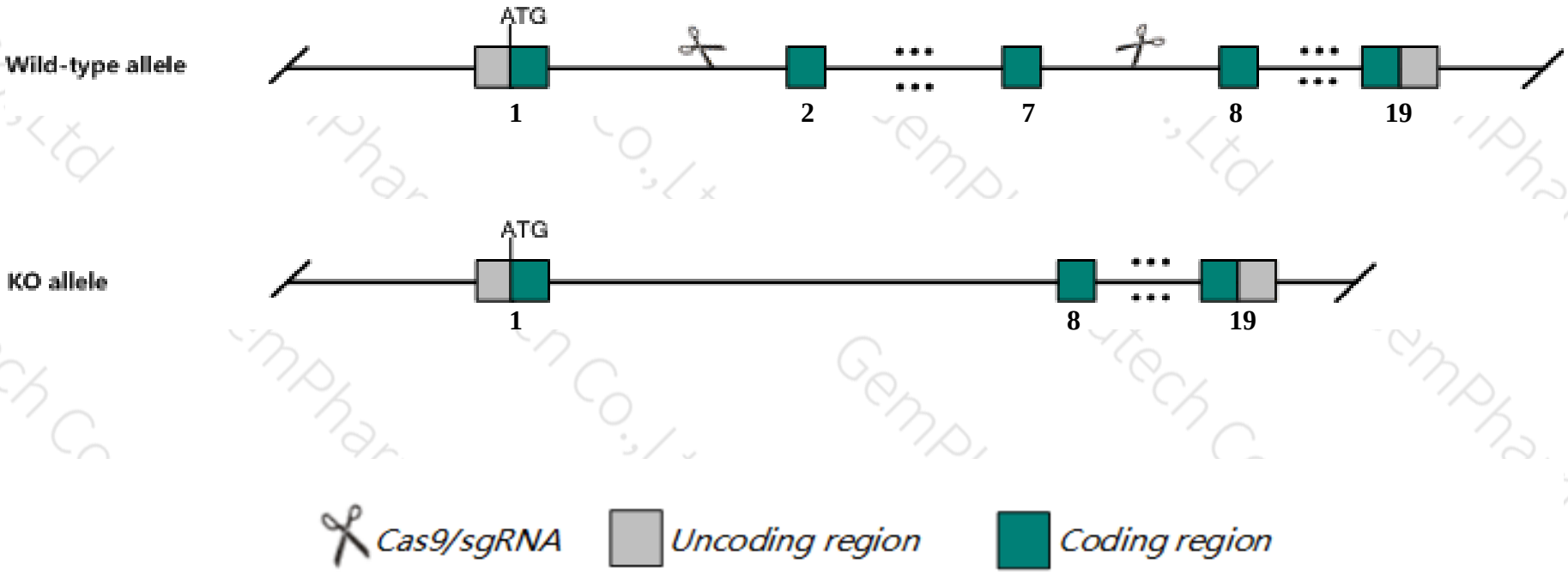
Design Date: 2019-8-6

Project Overview

Project Name	***Dnm1l***
Project type	**Cas9-KO**
Strain background	**C57BL/6J**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Dnm1l* gene. The schematic diagram is as follows:



Technical routes

➢ The *Dnm1l* gene has 7 transcripts. According to the structure of *Dnm1l* gene, exon2-exon7 of *Dnm1l-202* (ENSMUST00000096229.10) transcript is recommended as the knockout region.The region contains 556bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Dnm1l* 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.

Notice

➢ According to the existing MGI data,Mice homozygous for a knock-out allele exhibit embryonic lethality at E11.5 with internal hemorrhage and small size. Mice heterozygous for an ENU induced allele have dilated cardiomyopathy and congestive heart failure, homozygous are embryonic lethal with posterior truncation at E11.5.

➢ The *Dnm1l* gene is located on the Chr16. 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）

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Dnm1l dynamin 1-like [Mus musculus (house mouse)]

Gene ID: 74006, updated on 7-Apr-2019

Summary

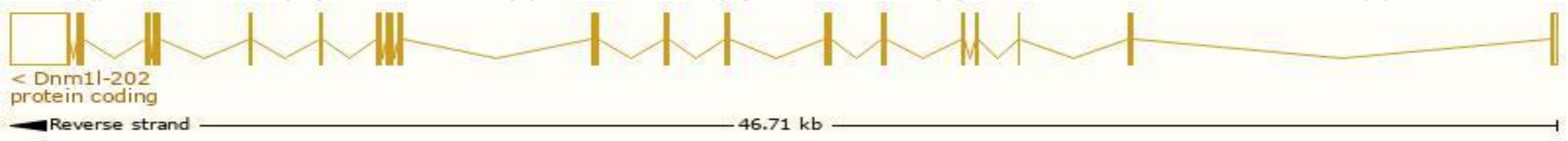
Official Symbol	Dnm1l provided by MGI
Official Full Name	dynamin 1-like provided byMGI
Primary source	MGI:MGI:1921256
See related	Ensembl:ENSMUSG00000022789
Gene type	protein coding
RefSeq status	REVIEWED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	6330417M19Rik, AI450666, Dlp1, Dnmlp1, Drp1, python
Summary	This gene encodes a member of the dynamin family. The encoded protein is localized to the cytoplasm and mitochondrial membrane, is involved in mitochondrial and peroxisomal division, and is essential for mitochondrial fission. Alternative splicing results in multiple transcript variants. A related pseudogene has been identified on chromosome 2. [provided by RefSeq, Feb 2013]
Expression	Broad expression in cerebellum adult (RPKM 25.5), CNS E18 (RPKM 24.8) and 24 other tissuesSee more
Orthologs	human all

Transcript information（Ensembl）

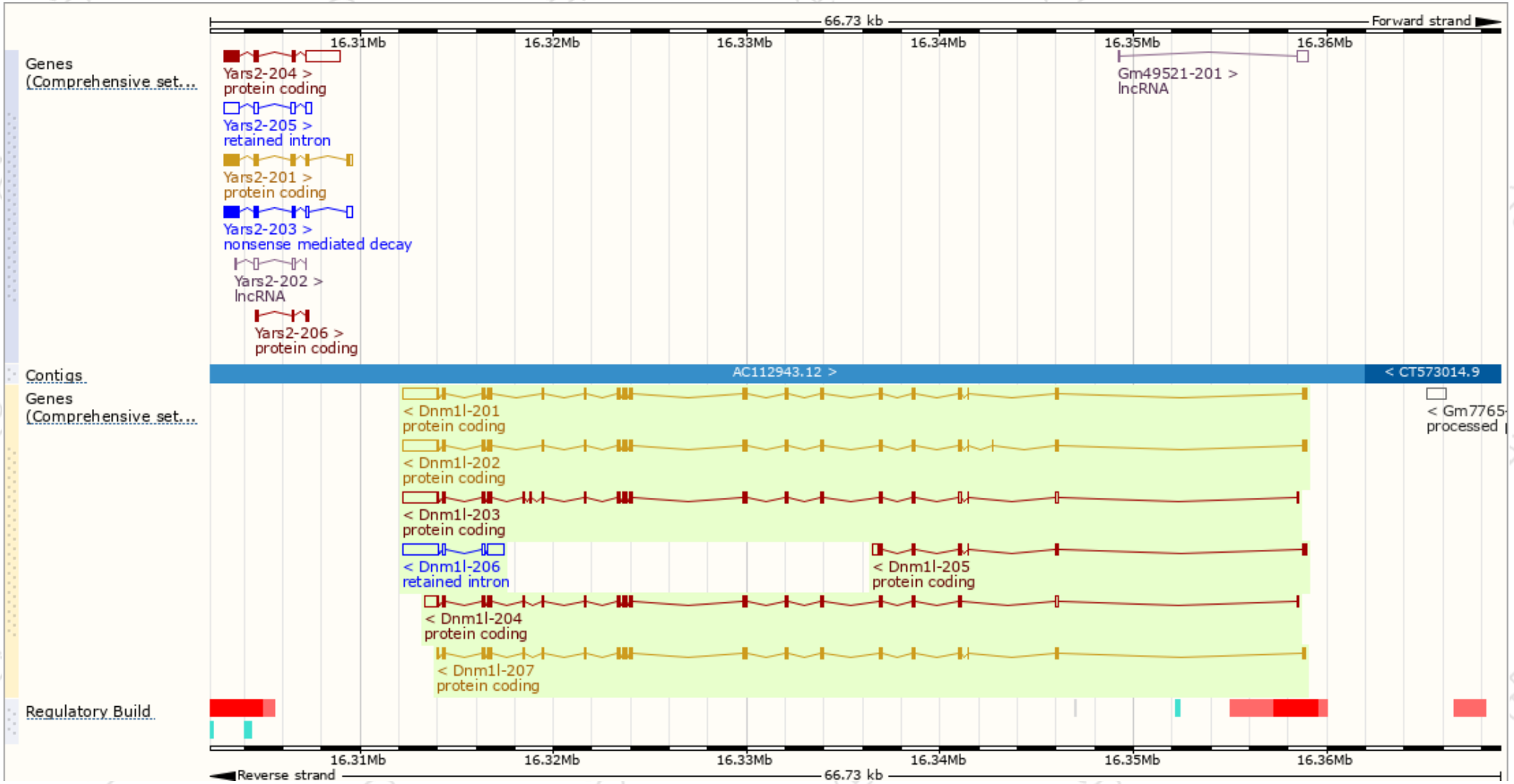
The gene has 7 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Dnm1l-202	ENSMUST00000096229.10	3966	712aa	Protein coding	CCDS27985	E9PUD2	TSL:1 GENCODE basic APPRIS P4
Dnm1l-201	ENSMUST00000023477.14	3951	699aa	Protein coding	CCDS27984	Q8K1M6	TSL:1 GENCODE basic APPRIS ALT1
Dnm1l-207	ENSMUST00000230980.1	2151	716aa	Protein coding	CCDS70689	Q8K1M6	GENCODE basic
Dnm1l-203	ENSMUST00000115749.2	3893	587aa	Protein coding	-	A0A2U3TZ67	TSL:1 GENCODE basic
Dnm1l-204	ENSMUST00000230022.1	2635	612aa	Protein coding	-	Q8K1M6	GENCODE basic
Dnm1l-205	ENSMUST00000230038.1	1074	221aa	Protein coding	-	Q8K1M6	GENCODE basic
Dnm1l-206	ENSMUST00000230958.1	2913	No protein	Retained intron	-	-	

The strategy is based on the design of *Dnm1l-202* transcript,The transcription is shown below

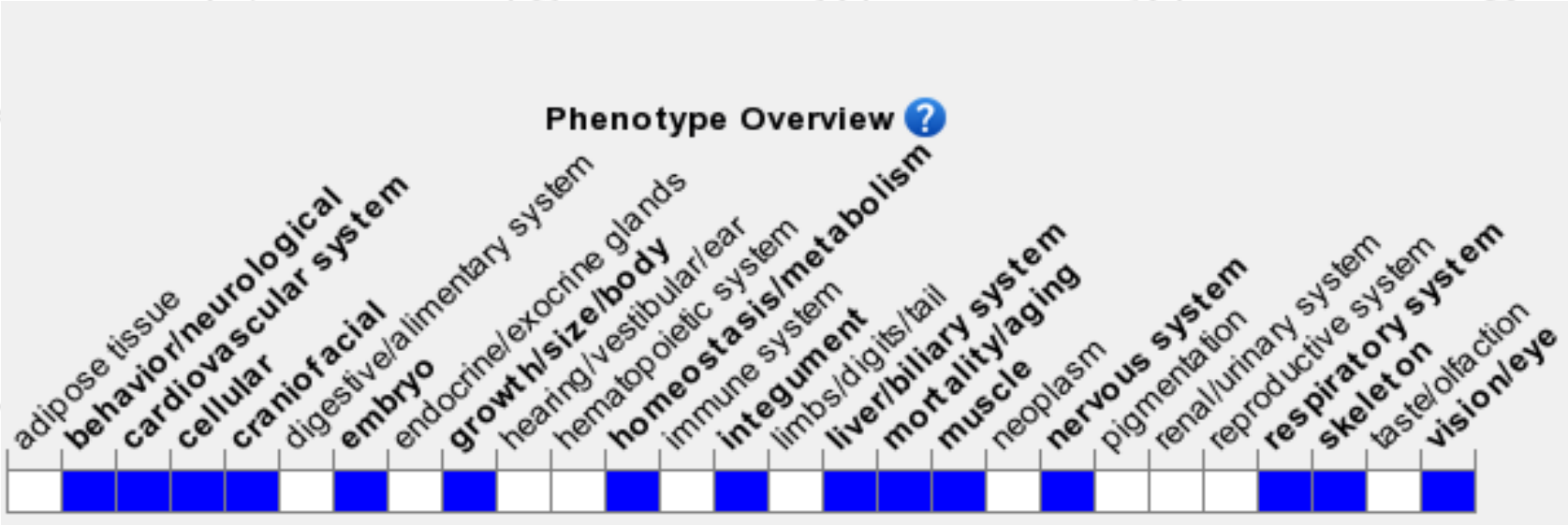


Genomic location distribution



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/).

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

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