

Ddx41 Cas9-KO Strategy

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Project Overview

Project Name

Ddx41

Project type

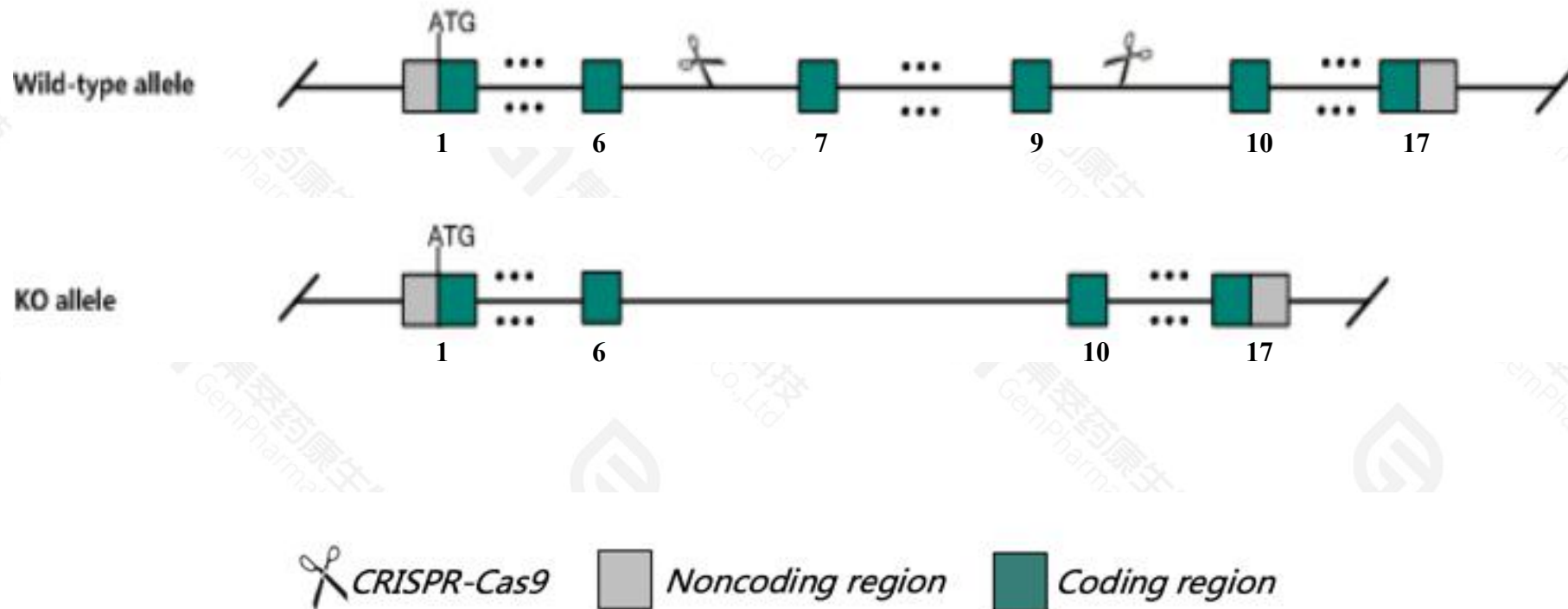
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR-Cas9 technology to edit the *Ddx41* gene. The schematic diagram is as follows:



- The *Ddx41* gene has 5 transcripts. According to the structure of *Ddx41* gene, exon7-exon9 of *Ddx41-201*(ENSMUST00000021956.9) transcript is recommended as the knockout region. The region contains 364bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR-Cas9 technology to modify *Ddx41* gene. The brief process is as follows: CRISPR-Cas9 system 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.

- According to the existing MGI data, constitutive homozygous knockout is embryonic lethal. Conditional homozygous KO in macrophages and DCs (dendritic cells) leads to a depressed immune response to viral infection.
- The KO region is close to *Gm46416* and *Dok3* gene. Knockout the region may affect the function of *Gm46416* and *Dok3* gene.
- The N-terminal of *Ddx41* gene will remain several amino acids, it may remain the partial function of *Ddx41* gene.
- The *Ddx41* gene is located on the Chr13. 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)

Ddx41 DEAD box helicase 41 [*Mus musculus* (house mouse)]

Gene ID: 72935, updated on 25-Jan-2022

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Summary

Official Symbol Ddx41 provided by [MGI](#)
Official Full Name DEAD box helicase 41 provided by [MGI](#)
Primary source [MGI:MGI:1920185](#)
See related [Ensembl:ENSMUSG00000021494](#) [AllianceGenome:MGI:1920185](#)
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 ABS; AA958953; AI324246; 2900024F02Rik
Summary Enables DNA binding activity. Acts upstream of or within cellular response to interferon-beta; defense response to virus; and positive regulation of transcription by RNA polymerase II. Located in endoplasmic reticulum and nucleus. Is expressed in hippocampus; pancreas; and testis. Orthologous to human DDX41 (DEAD-box helicase 41). [provided by Alliance of Genome Resources, Nov 2021]
Expression Ubiquitous expression in ovary adult (RPKM 33.6), spleen adult (RPKM 30.7) and 28 other tissues [See more](#)
Orthologs [human](#) [all](#)
NEW Try the new [Gene table](#)
Try the new [Transcript table](#)

Transcript information (Ensembl)

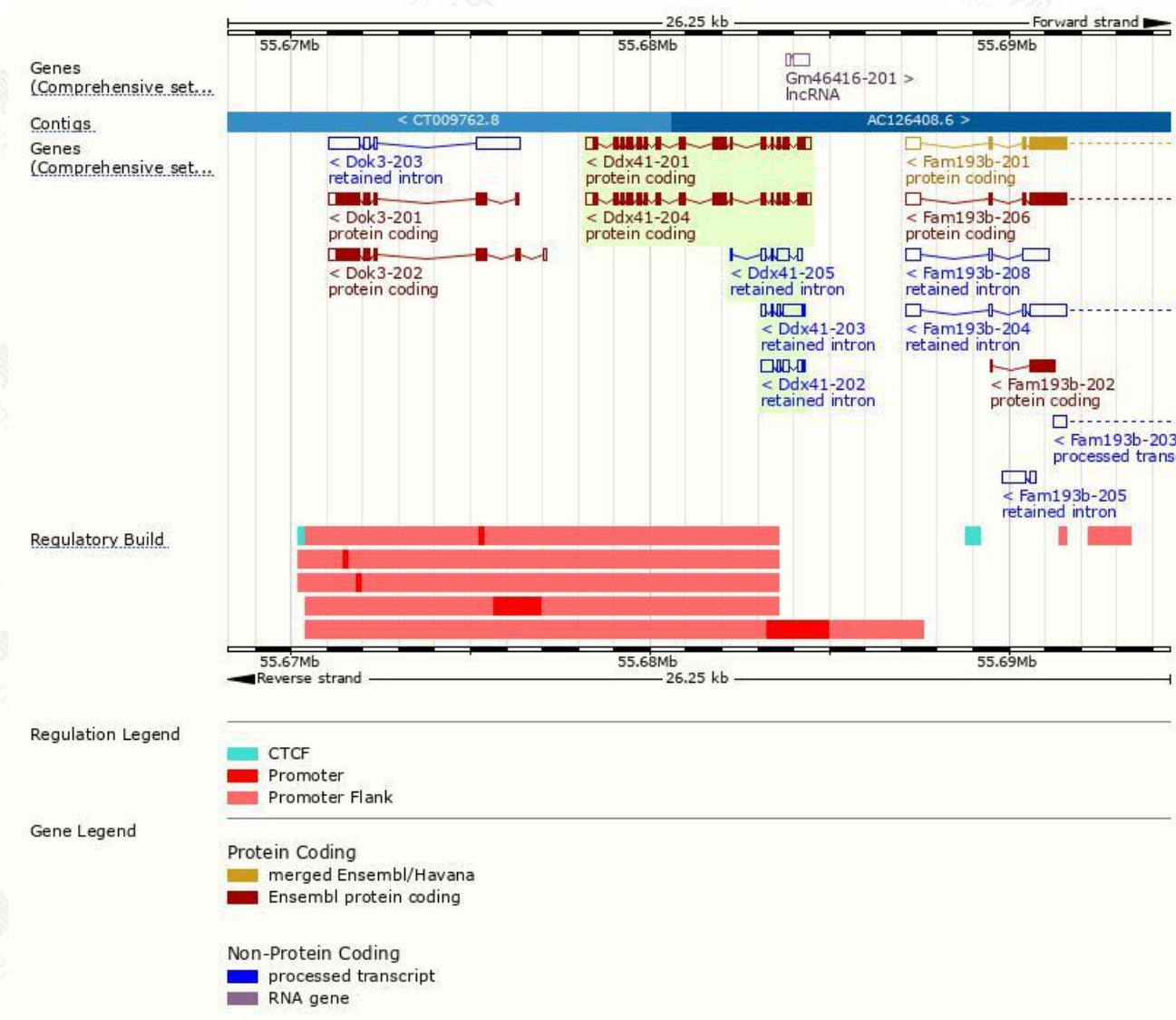
The gene has 5 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Ddx41-201	ENSMUST00000021956.9	2205	622aa	Protein coding	CCDS26549		TSL:1 , GENCODE basic , APPRIS P1 ,
Ddx41-204	ENSMUST00000224765.2	2199	633aa	Protein coding	-		GENCODE basic ,
Ddx41-203	ENSMUST00000224686.2	835	No protein	Retained intron	-		
Ddx41-205	ENSMUST00000225783.2	710	No protein	Retained intron	-		
Ddx41-202	ENSMUST00000224125.2	705	No protein	Retained intron	-		

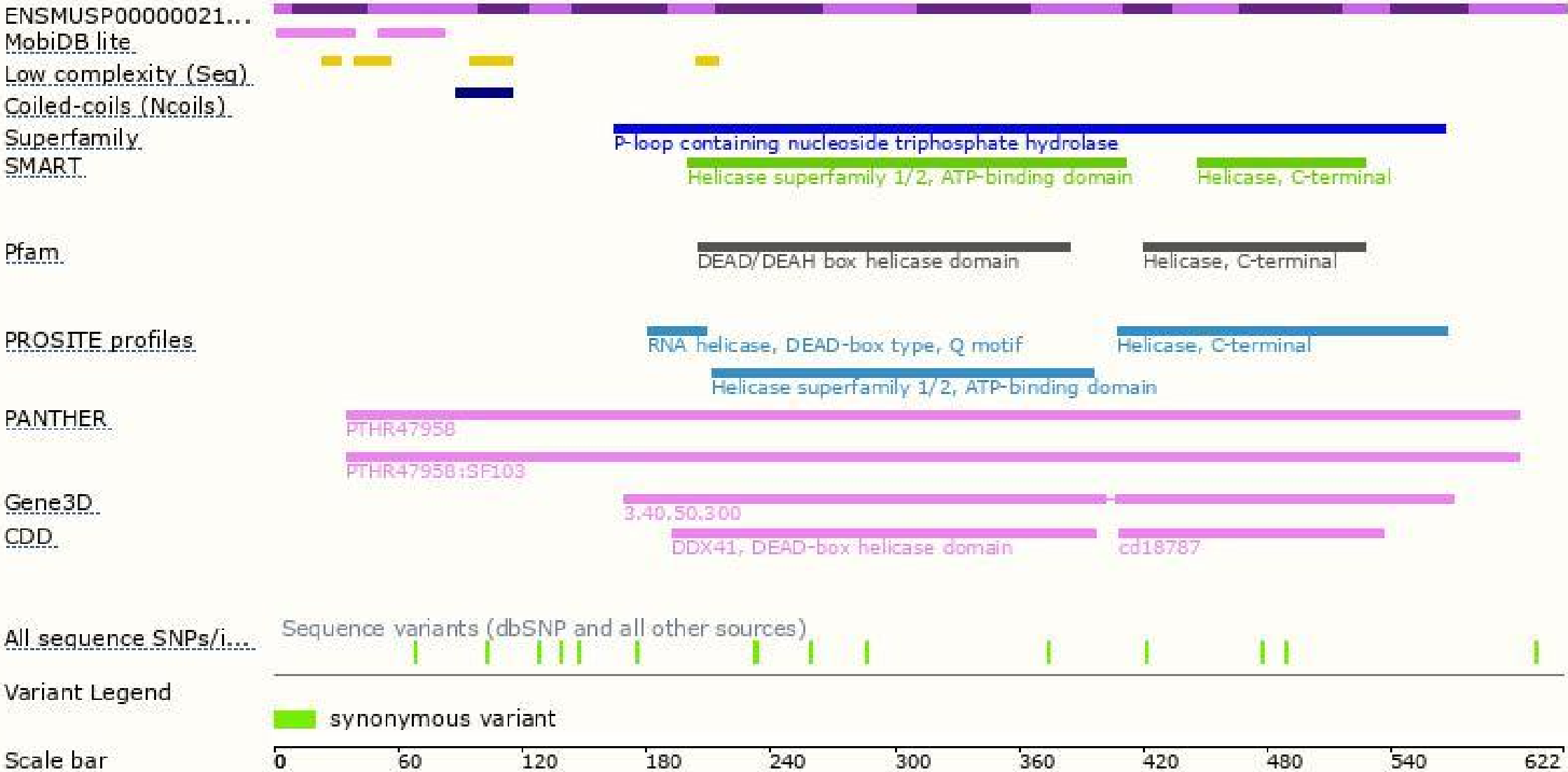
The strategy is based on the design of *Ddx41-201* transcript,the transcription is shown below:



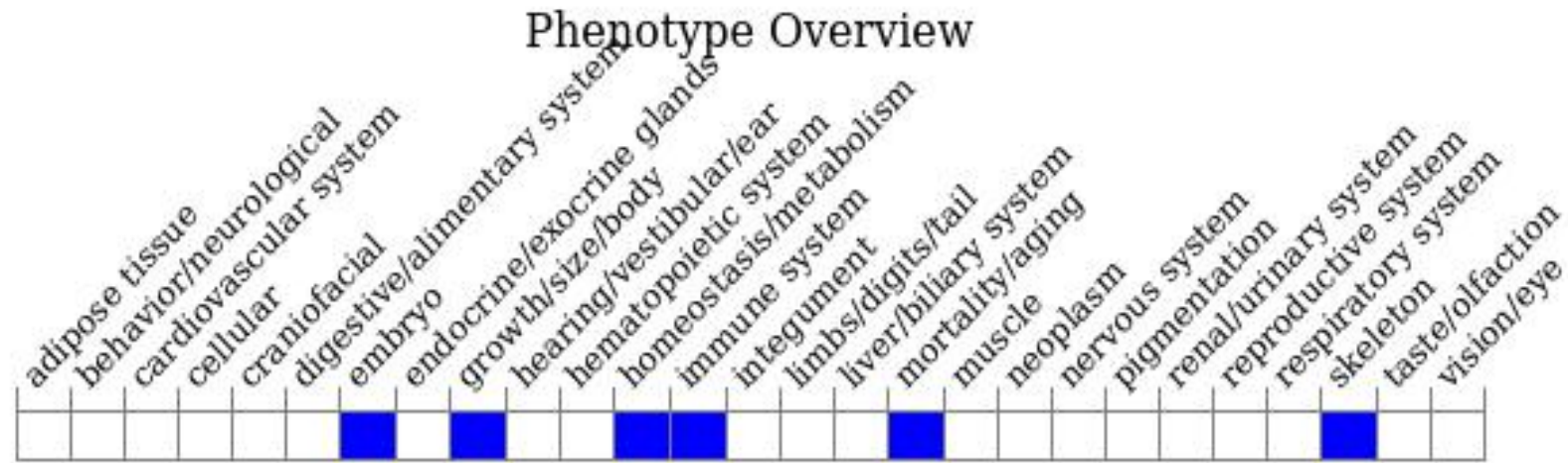
Genomic location distribution



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, constitutive homozygous knockout is embryonic lethal. Conditional homozygous KO in macrophages and DCs (dendritic cells) leads to a depressed immune response to viral infection.

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