Mxd3 Cas9-KO Strategy

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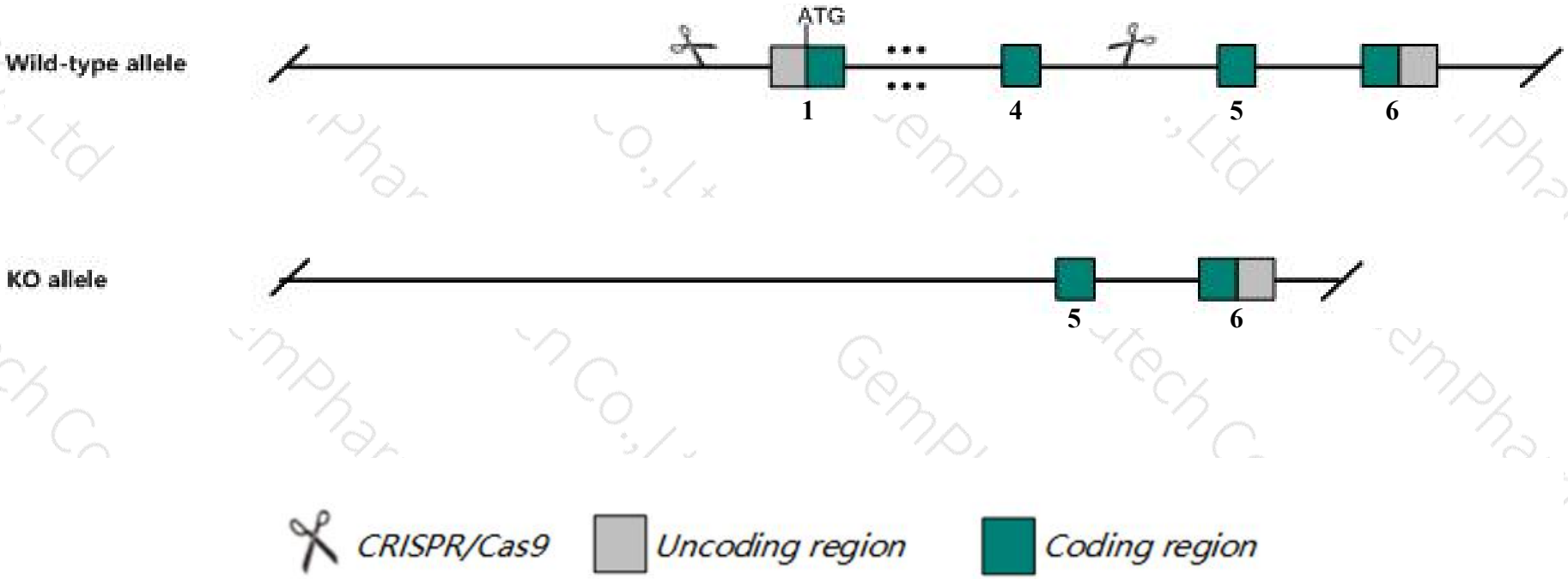
Project Overview

Project Name	***Mxd3***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Mxd3* gene. The schematic diagram is as follows:



Technical routes

➢ The *Mxd3* gene has 4 transcripts. According to the structure of *Mxd3* gene, exon1-exon4 of *Mxd3-201* (ENSMUST00000021941.7) transcript is recommended as the knockout region.The region contains start codon ATG. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Mxd3* gene. The brief process is as follows: CRISPR/Cas9 system

Notice

- According to the existing MGI data,Mice homozygous for disruptions in this gene have an essentially normal phenotype. The show an increased sensitivity to gamma irradiation.
- The knockout region is near to the N-terminal of *Rab24* gene,this strategy may influence the regulatory function of the N-terminal of *Rab24* gene.
- The *Mxd3* 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）

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Mxd3 Max dimerization protein 3 [*Mus musculus* (house mouse)]

Gene ID: 17121, updated on 12-Aug-2019

Summary

Official Symbol	Mxd3 provided by MGI
Official Full Name	Max dimerization protein 3 provided by MGI
Primary source	MGI:MGI:104987
See related	Ensembl:ENSMUSG00000021485
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	Mad3; bHLHc13; 4631412E13Rik
Expression	Ubiquitous expression in thymus adult (RPKM 35.6), duodenum adult (RPKM 33.9) and 24 other tissues See more
Orthologs	human all

Genomic context

Location: 13 B1; 13 29.8 cM

See Mxd3 in Genome Data Viewer

Exon count: 6

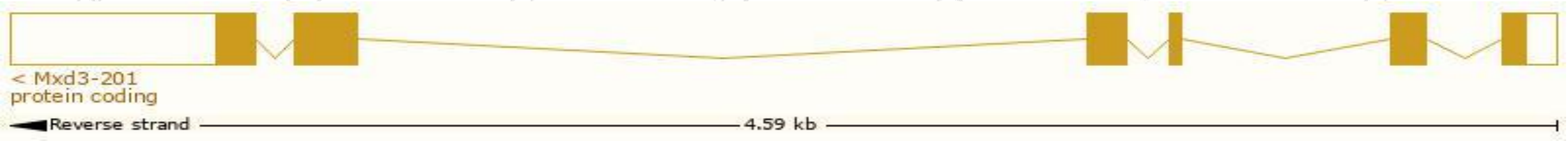
Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	13	NC_000079.6 (55325170..55329900, complement)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	13	NC_000079.5 (55426529..55431091, complement)

Transcript information（Ensembl）

The gene has 4 transcripts,all transcripts are shown below:

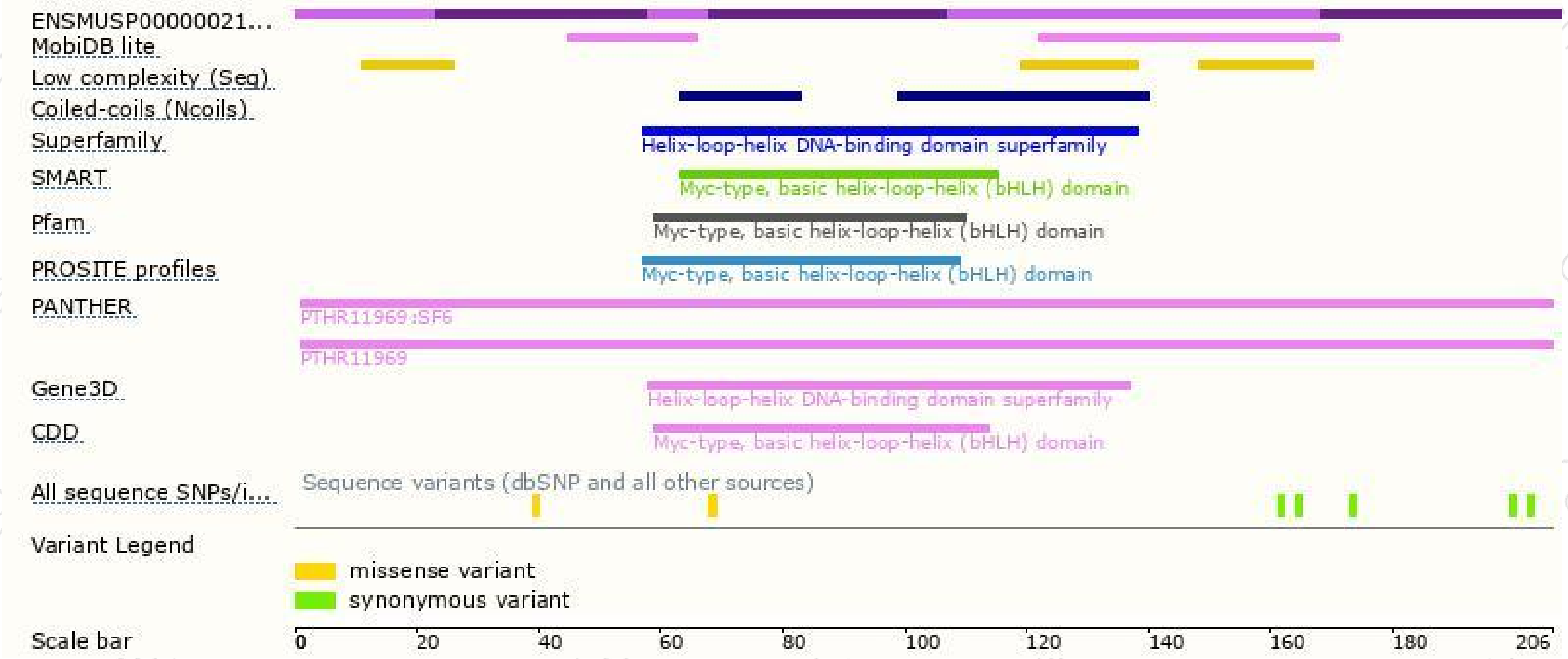
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Mxd3-201	ENSMUST00000021941.7	1327	206aa	Protein coding	CCDS26543	Q80US8	TSL:1 GENCODE basic APPRIS P1
Mxd3-203	ENSMUST00000146181.7	1742	No protein	Retained intron	-	-	TSL:2
Mxd3-204	ENSMUST00000225561.1	1296	No protein	Retained intron	-	-	
Mxd3-202	ENSMUST00000141644.1	683	No protein	lncRNA	-	-	TSL:3

The strategy is based on the design of *Mxd3-201* transcript,The transcription is shown below

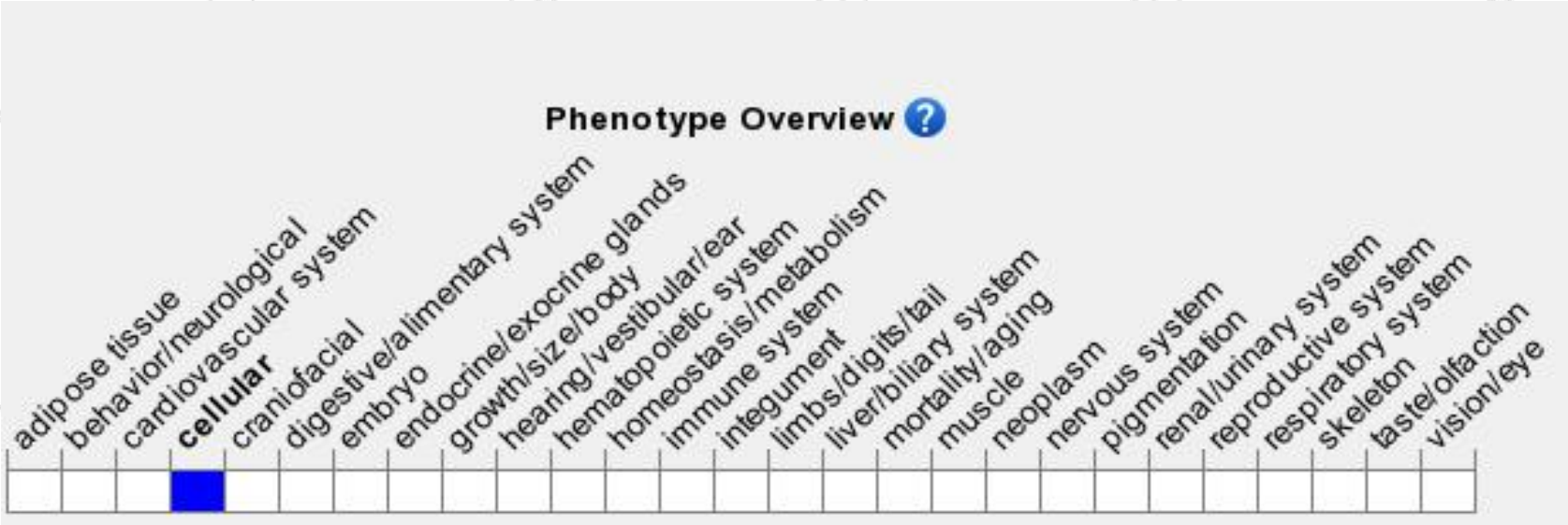


Genomic location distribution

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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