

Dnaic1 Cas9-KO Strategy

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Project Overview

Project Name

Dnaic1

Project type

Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Dnaic1* gene. The schematic diagram is as follows:



- The *Dnaic1* gene has 3 transcripts. According to the structure of *Dnaic1* gene, exon2-exon10 of *Dnaic1-201* (ENSMUST00000102963.9) transcript is recommended as the knockout region. The region contains 877bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Dnaic1* gene. The brief process is as follows: CRISPR/Cas9 system

- According to the existing MGI data, Mutant mice exhibit situs inversus, heterotaxia and ciliary dyskinesia including cardiovascular defects and decreased ciliary activity in the trachea, reduced to absent mucociliary clearance, and chronic rhinosinusitis. Hydrocephaly is also seen.
- The effect on transcript *Dnaic1*-202 is unknown.
- Transcript *Dnaic1*-203 may not be affected.
- The *Dnaic1* gene is located on the Chr4. 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)

Dnaic1 dynein, axonemal, intermediate chain 1 [*Mus musculus* (house mouse)]

Gene ID: 68922, updated on 26-Nov-2019

Summary

Official Symbol	Dnaic1 provided by MGI
Official Full Name	dynein, axonemal, intermediate chain 1 provided by MGI
Primary source	MGI:MGI:1916172
See related	Ensembl:ENSMUSG00000061322
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	Dnai1; BB124644; b2b1526Clo; 1110066F04Rik
Expression	Biased expression in testis adult (RPKM 28.5), bladder adult (RPKM 10.6) and 5 other tissues See more
Orthologs	human all

Genomic context

Location: 4; 4 A5

See Dnaic1 in [Genome Data Viewer](#)

Exon count: 20

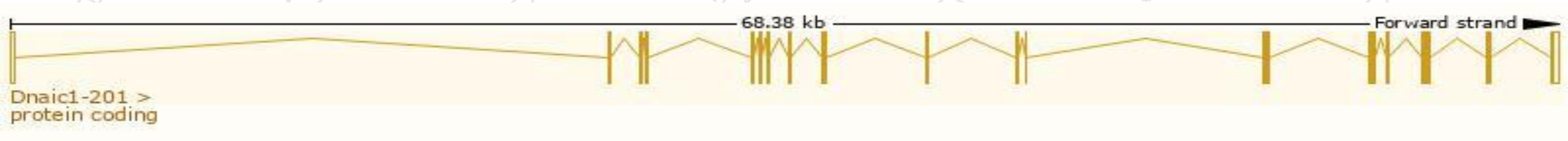
Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	4	NC_000070.6 (41569647..41638158)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	4	NC_000070.5 (41516827..41585191)

Transcript information (Ensembl)

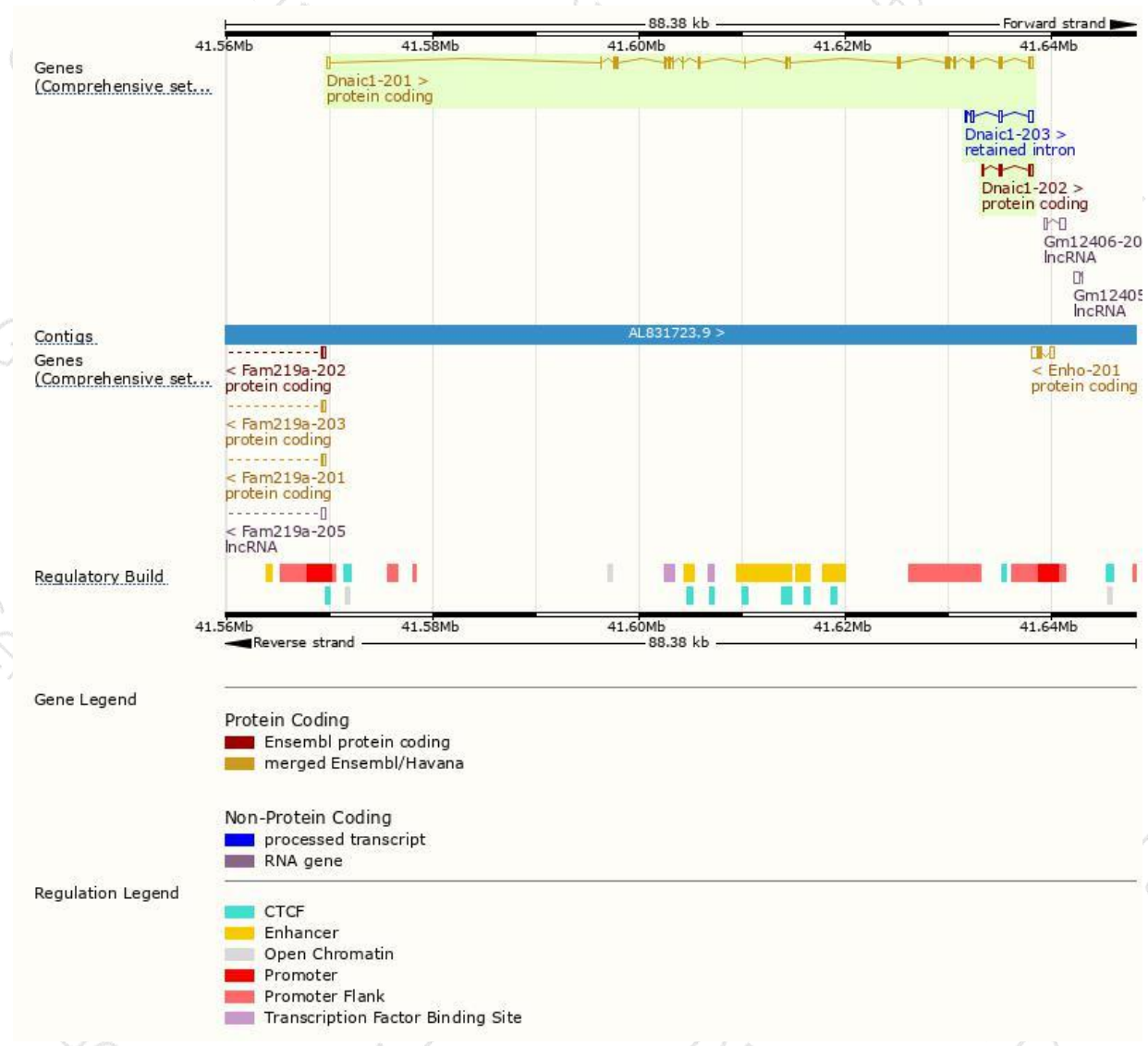
The gene has 3 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Dnaic1-201	ENSMUST00000102963.9	2510	701aa	Protein coding	CCDS18066	A2ANP4 Q8C0M8	TSL:1 GENCODE basic APPRIS P1
Dnaic1-202	ENSMUST00000119127.1	500	95aa	Protein coding	-	Q8BMY8	TSL:1 GENCODE basic
Dnaic1-203	ENSMUST00000143198.1	965	No protein	Retained intron	-	-	TSL:5

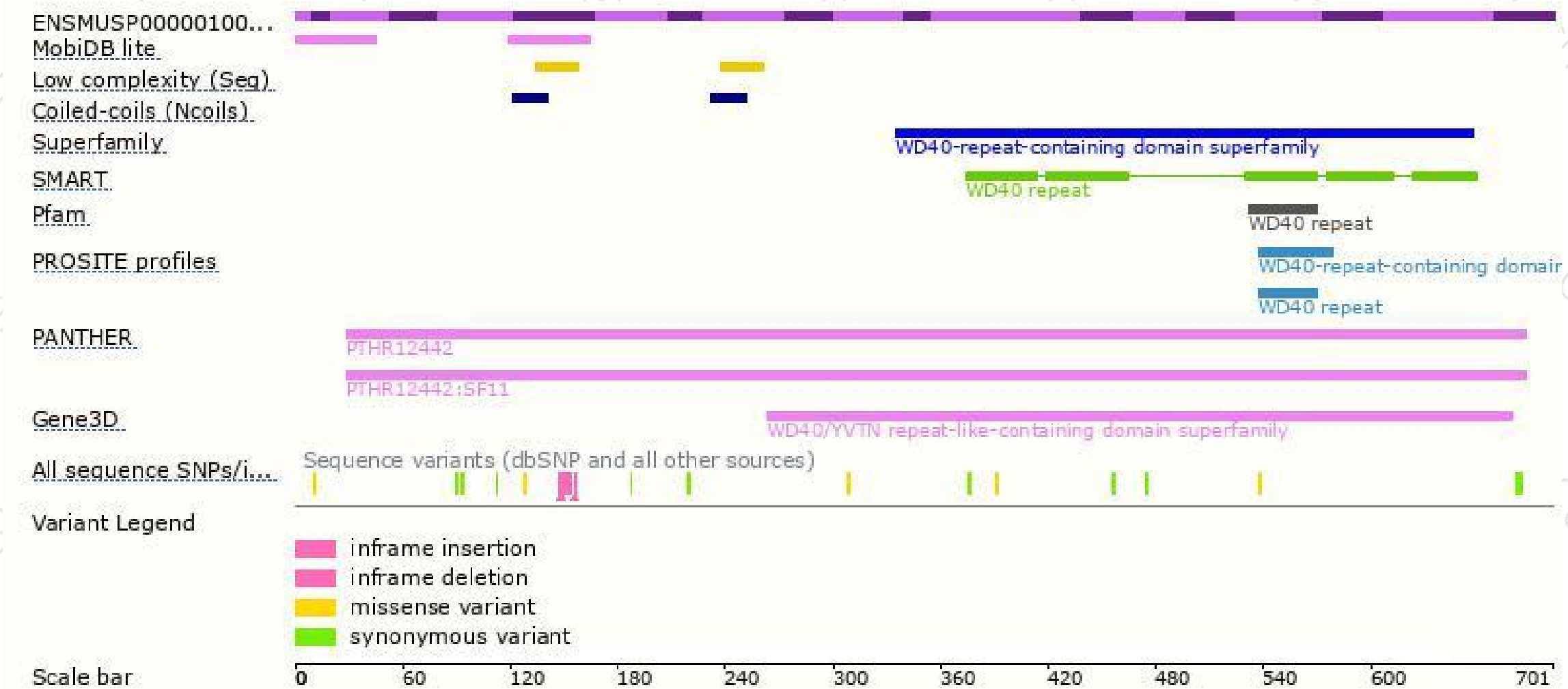
The strategy is based on the design of *Dnaic1-201* transcript,The transcription is shown below



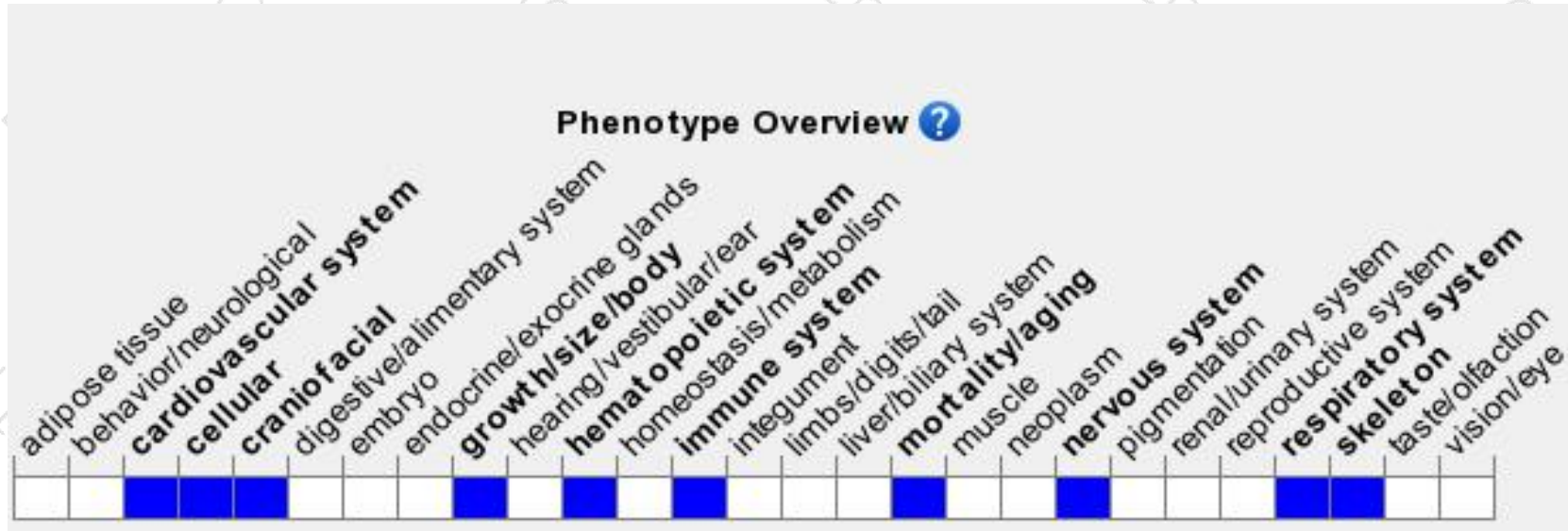
Genomic location distribution



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, Mutant mice exhibit situs inversus, heterotaxia and ciliary dyskinesia including cardiovascular defects and decreased ciliary activity in the trachea, reduced to absent mucociliary clearance, and chronic rhinosinusitis. Hydrocephaly is also seen.

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

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