

Dcdc2a Cas9-KO Strategy

Designer:

JiaYu

Reviewer:

Xiaojing Li

Design Date:

2020-2-18

Project Overview

Project Name

Dcdc2a

Project type

Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Dcdc2a* gene. The schematic diagram is as follows:



- The *Dcdc2a* gene has 4 transcripts. According to the structure of *Dcdc2a* gene, exon2 of *Dcdc2a-202* (ENSMUST00000069614.6) transcript is recommended as the knockout region. The region contains 55bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Dcdc2a* gene. The brief process is as follows: CRISPR/Cas9 system

- According to the existing MGI data, Mice homozygous for a knock-out allele exhibit impaired short term object recognition, impaired visuo-spatial learning and memory and increased anxiety-related response.
- The *Dcdc2a* 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)

Dcdc2a doublecortin domain containing 2a [Mus musculus (house mouse)]

Gene ID: 195208, updated on 31-Jan-2019

Summary



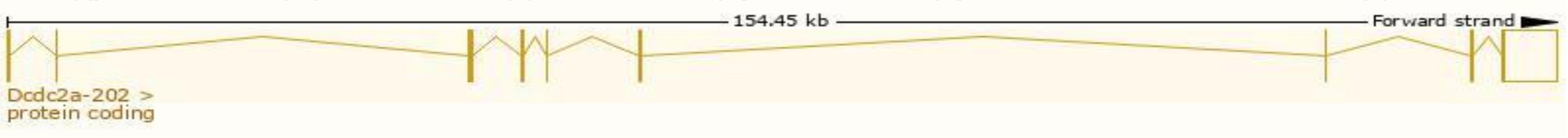
Official Symbol	Dcdc2a provided by MGI
Official Full Name	doublecortin domain containing 2a provided by MGI
Primary source	MGI:MGI:2652818
See related	Ensembl:ENSMUSG00000035910
Gene type	protein coding
RefSeq status	REVIEWED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	AW492955, Dcdc2, RU2
Summary	This gene encodes a member of the doublecortin family. The protein encoded by this gene contains two doublecortin domains. The doublecortin domain has been demonstrated to bind tubulin and enhance microtubule polymerization. Alternatively spliced transcript variants encoding distinct isoforms have been found for this gene. [provided by RefSeq, Sep 2010]
Expression	Low expression observed in reference dataset See more
Orthologs	human all

Transcript information (Ensembl)

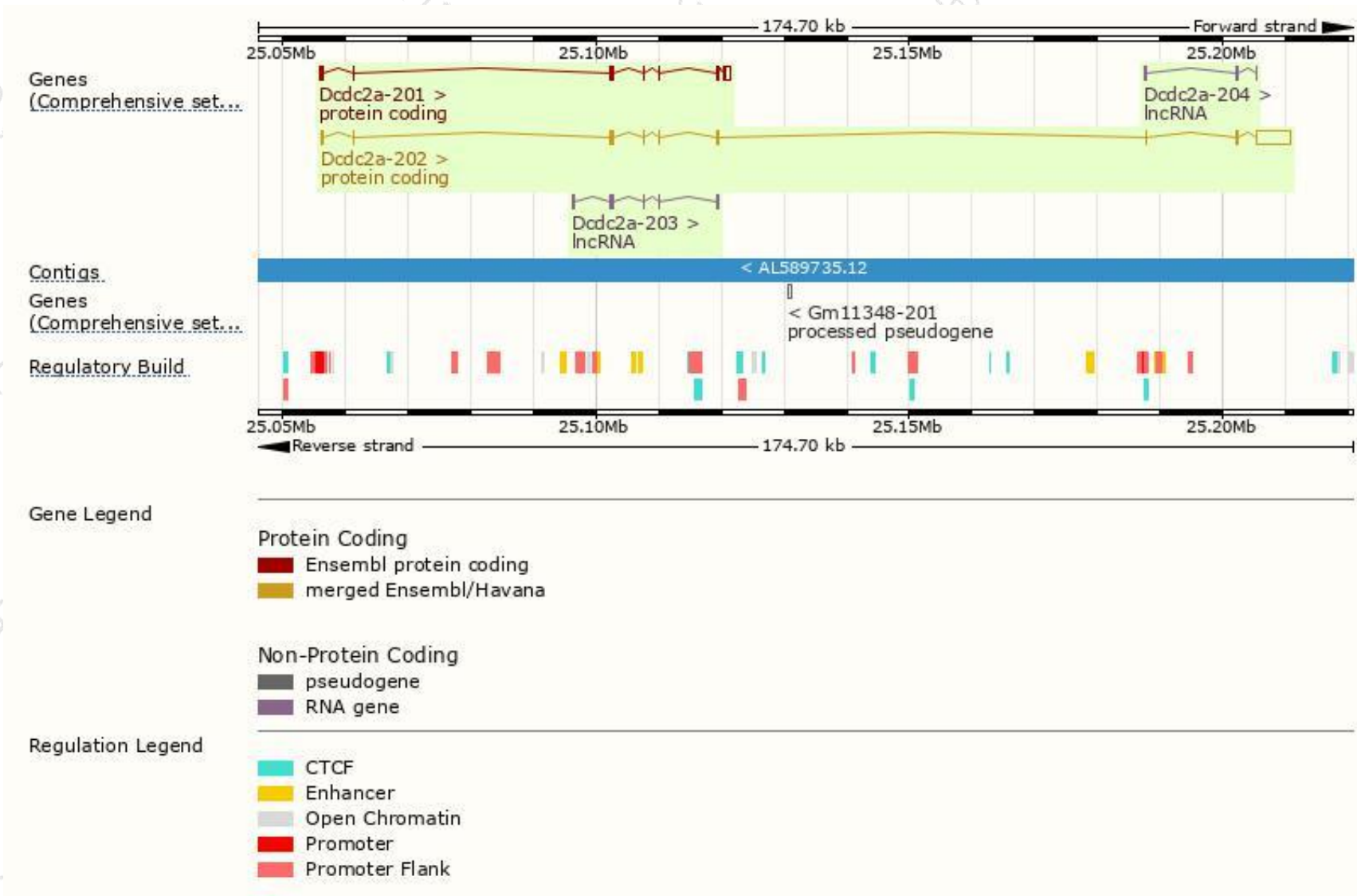
The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Dcdc2a-202	ENSMUST00000069614.6	6634	475aa	Protein coding	CCDS26386	R4GML1	TSL:1 GENCODE basic APPRIS P1
Dcdc2a-201	ENSMUST00000036932.14	2345	368aa	Protein coding	CCDS56873	Q5DU00	TSL:1 GENCODE basic
Dcdc2a-203	ENSMUST00000159129.1	678	No protein	lncRNA	-	-	TSL:3
Dcdc2a-204	ENSMUST00000160363.1	661	No protein	lncRNA	-	-	TSL:3

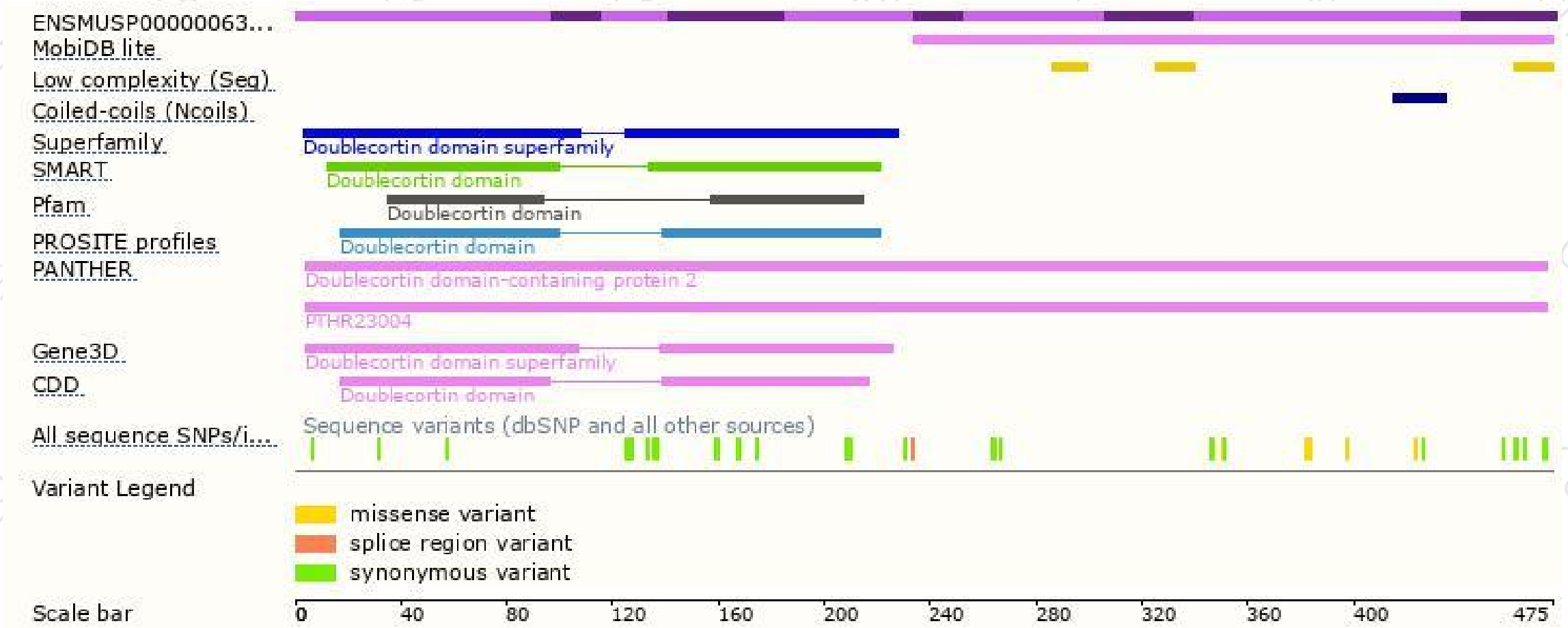
The strategy is based on the design of *Dcdc2a-202* transcript,The transcription is shown below



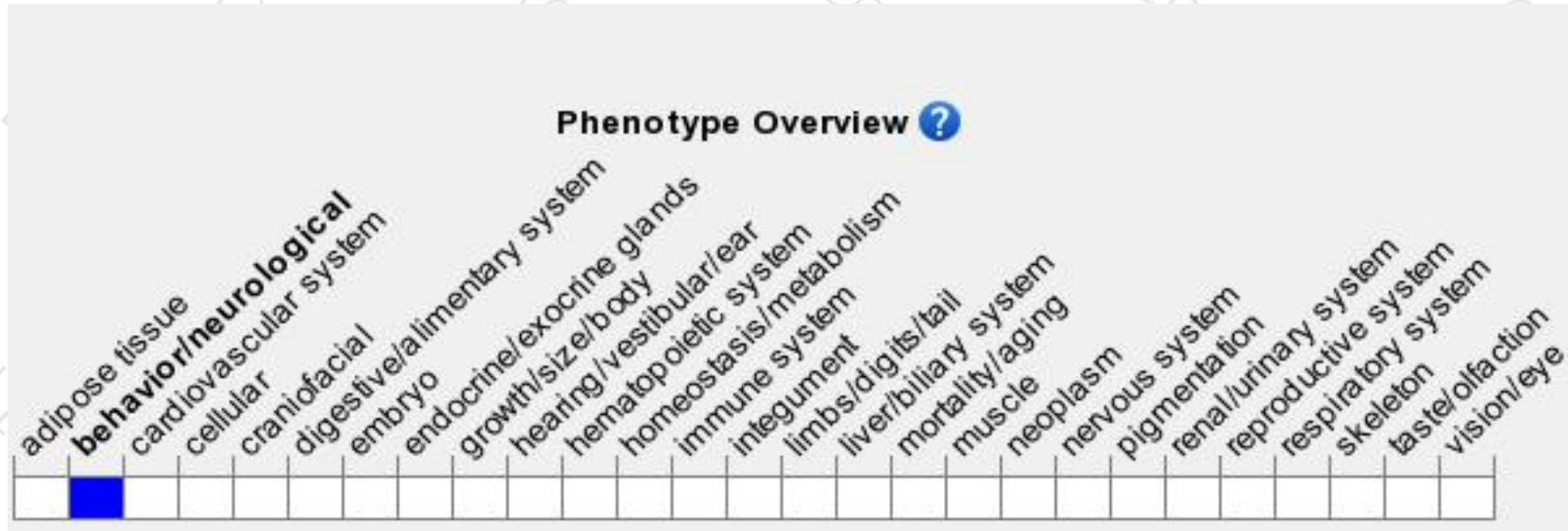
Genomic location distribution



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/>).

According to the existing MGI data, Mice homozygous for a knock-out allele exhibit impaired short term object recognition, impaired visuo-spatial learning and memory and increased anxiety-related response.

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

Tel: 400-9660890

