

Ccdc40 Cas9-CKO Strategy

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Project Overview

Project Name

Ccdc40

Project type

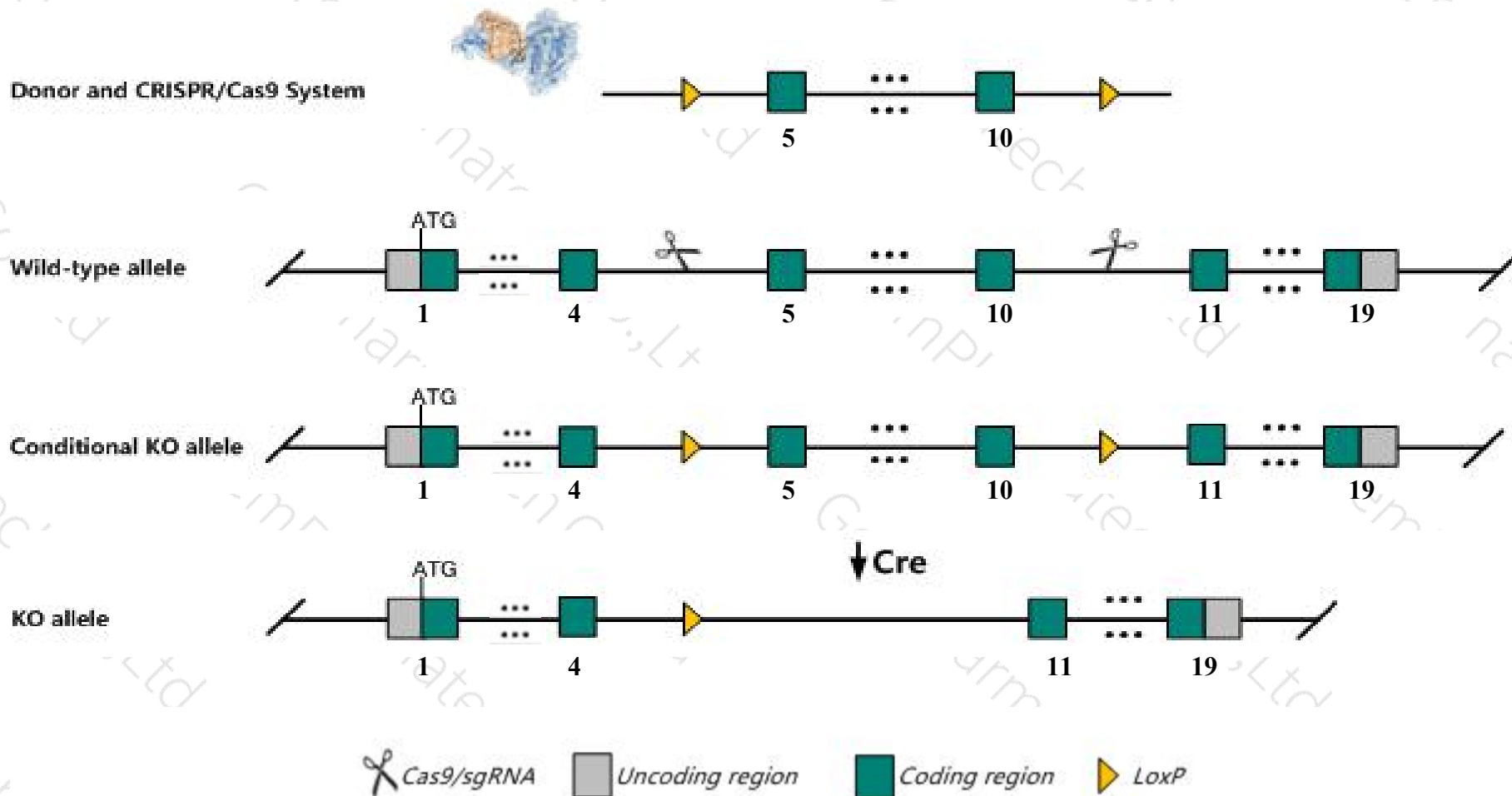
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Ccdc40* gene. The schematic diagram is as follows:



- The *Ccdc40* gene has 9 transcripts. According to the structure of *Ccdc40* gene, exon5-exon10 of *Ccdc40-201* (ENSMUST00000053440.7) transcript is recommended as the knockout region. The region contains 862bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Ccdc40* gene. The brief process is as follows: CRISPR/Cas9 system and Donor 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.
- The flox mice will be knocked out after mating with mice expressing Cre recombinase, resulting in the loss of function of the target gene in specific tissues and cell types.

- According to the existing MGI data, Mice homozygous for an ENU-induced allele exhibit heterotaxia, hydrocephalus, short embryonic cilia, and postnatal lethality.
- The *Ccdc40* gene is located on the Chr11. 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at existing technological level.

Gene information (NCBI)

Ccdc40 coiled-coil domain containing 40 [*Mus musculus* (house mouse)]

Gene ID: 207607, updated on 12-Aug-2019

Summary

Official Symbol	Ccdc40 provided by MGI
Official Full Name	coiled-coil domain containing 40 provided by MGI
Primary source	MGI:MGI:2443893
See related	Ensembl:ENSMUSG000000039963
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	B930008I02Rik
Expression	Biased expression in testis adult (RPKM 14.7), CNS E11.5 (RPKM 3.1) and 5 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

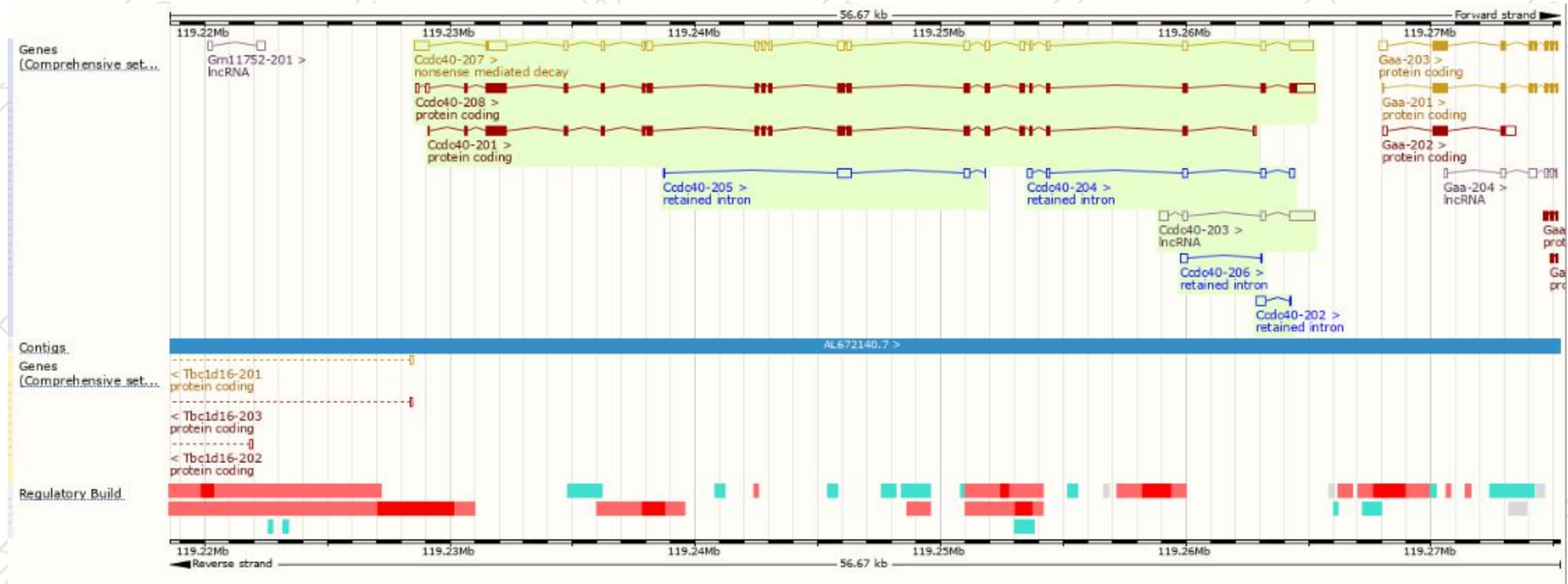
The gene has 8 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Ccdc40-208	ENSMUST00000236813.1	4769	1262aa	Protein coding	-	-	GENCODE basic APPRIS P5
Ccdc40-201	ENSMUST0000053440.7	3524	1137aa	Protein coding	-	Q8BI79	TSL:1 GENCODE basic APPRIS ALT2
Ccdc40-207	ENSMUST00000235971.1	4979	47aa	Nonsense mediated decay	-	-	-
Ccdc40-205	ENSMUST00000143066.1	824	No protein	Retained intron	-	-	TSL:5
Ccdc40-204	ENSMUST00000133788.7	799	No protein	Retained intron	-	-	TSL:3
Ccdc40-202	ENSMUST00000125724.1	403	No protein	Retained intron	-	-	TSL:2
Ccdc40-206	ENSMUST00000155683.1	324	No protein	Retained intron	-	-	TSL:3
Ccdc40-203	ENSMUST00000126652.1	1662	No protein	lncRNA	-	-	TSL:1

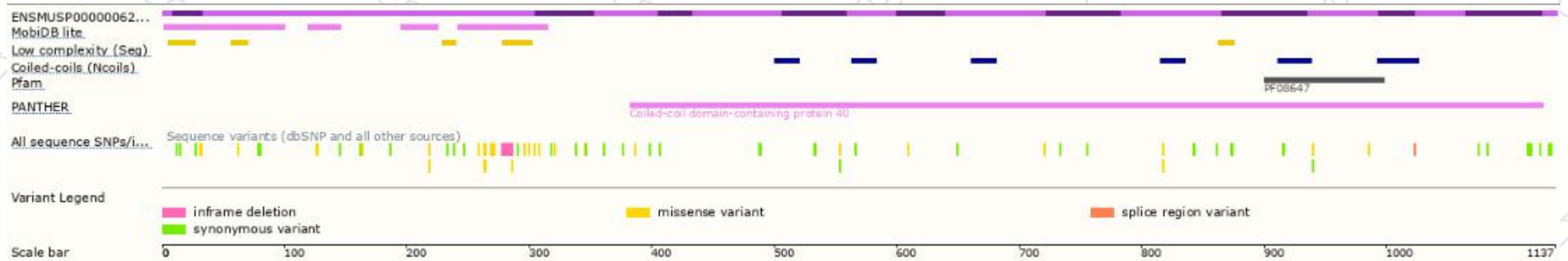
The strategy is based on the design of *Ccdc40-201* transcript,The transcription is shown below



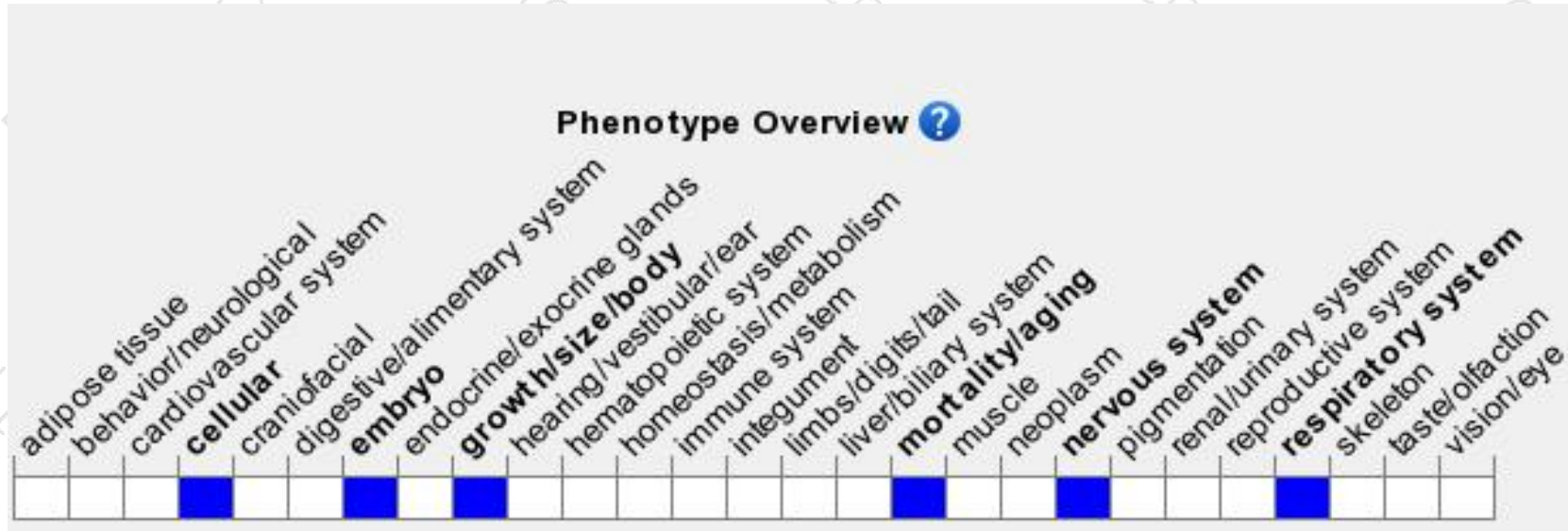
Genomic location distribution



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, Mice homozygous for an ENU-induced allele exhibit heterotaxia, hydrocephalus, short embryonic cilia, and postnatal lethality.

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

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