

Ccnd3 Cas9-CKO Strategy

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Project Overview

Project Name

Ccnd3

Project type

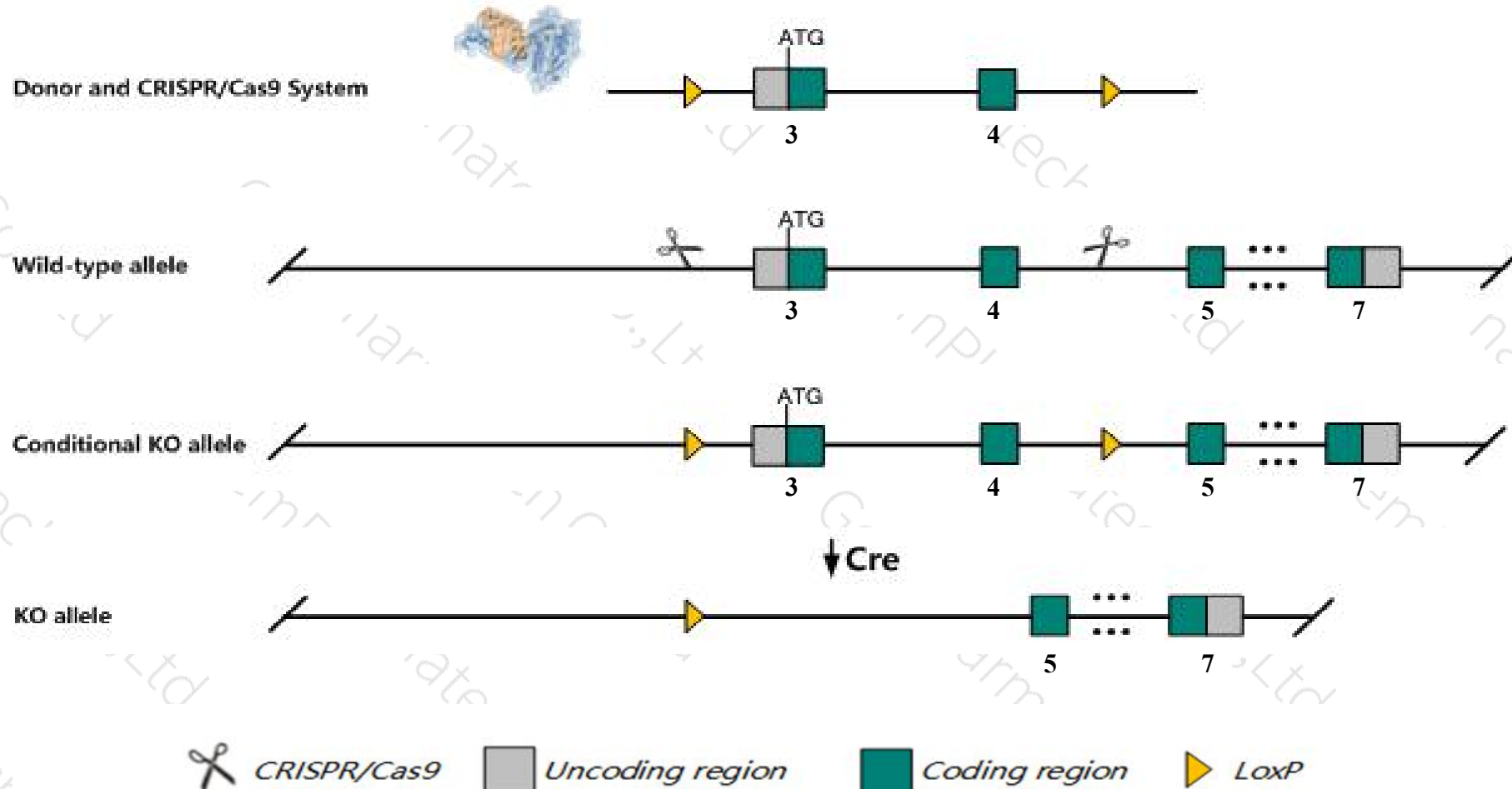
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Ccnd3* gene. The schematic diagram is as follows:



- The *Ccnd3* gene has 21 transcripts. According to the structure of *Ccnd3* gene, exon3-exon4 of *Ccnd3*-202 (ENSMUST00000171031.7) 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 *Ccnd3* 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 a knock-out allele exhibit severe thymus hypoplasia, abnormal thymocyte development, and impaired expansion of immature T lymphocytes.
- Transcripts *Ccnd3-209*, *Ccnd3-219*, *Ccnd3-221* may not be affected.
- The *Ccnd3* gene is located on the Chr17. 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)

Ccnd3 cyclin D3 [*Mus musculus* (house mouse)]

Gene ID: 12445, updated on 5-Nov-2019

Summary

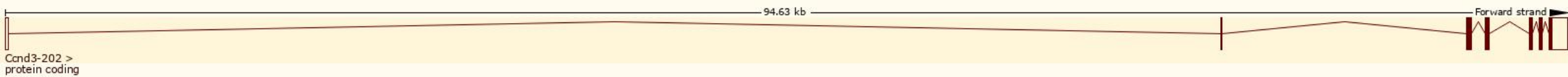
Official Symbol	Ccnd3 provided by MGI
Official Full Name	cyclin D3 provided by MGI
Primary source	MGI:MGI:88315
See related	Ensembl:ENSMUSG000000034165
Gene type	protein coding
RefSeq status	VALIDATED
Organism	<i>Mus musculus</i>
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	C78795; AA682053; AL024085; AW146355; 9230106B05Rik
Expression	Broad expression in thymus adult (RPKM 402.8), adrenal adult (RPKM 319.1) and 18 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

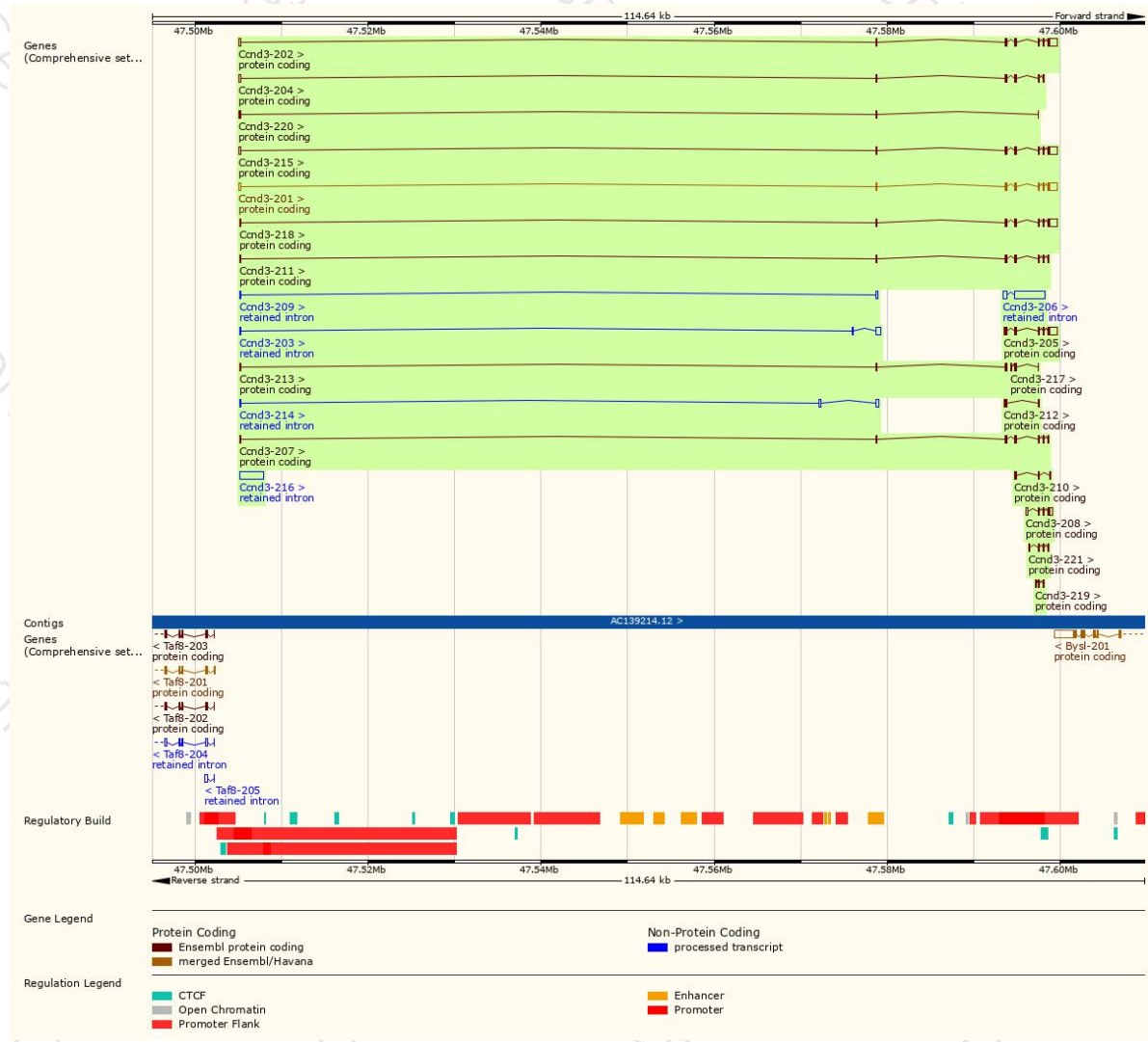
The gene has 21 transcripts, all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Ccnd3-202	ENSMUST00000171031.7	2113	292aa	Protein coding	CCDS28850	P30282 Q3TSW4	TSL:5 GENCODE basic APPRIS P1
Ccnd3-215	ENSMUST00000183044.7	2064	292aa	Protein coding	CCDS28850	P30282 Q3TSW4	TSL:1 GENCODE basic APPRIS P1
Ccnd3-218	ENSMUST00000183177.7	2060	292aa	Protein coding	CCDS28850	P30282 Q3TSW4	TSL:5 GENCODE basic APPRIS P1
Ccnd3-201	ENSMUST00000037333.16	1999	292aa	Protein coding	CCDS28850	P30282 Q3TSW4	TSL:1 GENCODE basic APPRIS P1
Ccnd3-205	ENSMUST00000182209.7	1977	292aa	Protein coding	CCDS28850	P30282 Q3TSW4	TSL:1 GENCODE basic APPRIS P1
Ccnd3-204	ENSMUST00000182129.7	952	214aa	Protein coding	-	S4R240	CDS 3' incomplete TSL:5
Ccnd3-208	ENSMUST00000182539.7	931	96aa	Protein coding	-	S4R216	TSL:2 GENCODE basic
Ccnd3-211	ENSMUST00000182848.7	926	243aa	Protein coding	-	S4R2N5	CDS 3' incomplete TSL:5
Ccnd3-207	ENSMUST00000182506.7	853	250aa	Protein coding	-	S4R1D9	CDS 3' incomplete TSL:5
Ccnd3-221	ENSMUST00000183256.7	560	75aa	Protein coding	-	S4R275	CDS 3' incomplete TSL:5
Ccnd3-212	ENSMUST00000182874.2	484	119aa	Protein coding	-	S4R2N1	CDS 3' incomplete TSL:5
Ccnd3-210	ENSMUST00000182846.2	464	125aa	Protein coding	-	S4R1R1	CDS 5' incomplete TSL:3
Ccnd3-217	ENSMUST00000183158.1	385	99aa	Protein coding	-	S4R1C8	CDS 3' incomplete TSL:2
Ccnd3-219	ENSMUST00000183206.1	336	29aa	Protein coding	-	S4R2Q7	CDS 3' incomplete TSL:3
Ccnd3-220	ENSMUST00000183210.1	299	52aa	Protein coding	-	S4R2I5	CDS 3' incomplete TSL:5
Ccnd3-213	ENSMUST00000182935.7	277	43aa	Protein coding	-	S4R1L8	CDS 3' incomplete TSL:3
Ccnd3-206	ENSMUST00000182281.1	3858	No protein	Retained intron	-	-	TSL:1
Ccnd3-216	ENSMUST00000183061.1	2670	No protein	Retained intron	-	-	TSL:NA
Ccnd3-203	ENSMUST00000182060.1	754	No protein	Retained intron	-	-	TSL:1
Ccnd3-214	ENSMUST00000183014.1	552	No protein	Retained intron	-	-	TSL:3
Ccnd3-209	ENSMUST00000182591.1	283	No protein	Retained intron	-	-	TSL:2

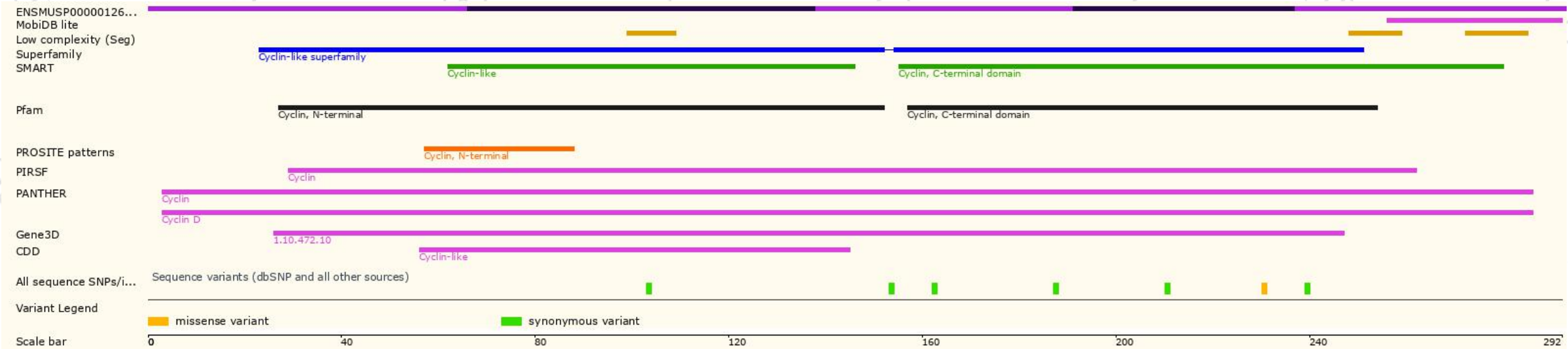
The strategy is based on the design of *Ccnd3-202* transcript, the transcription is shown below:



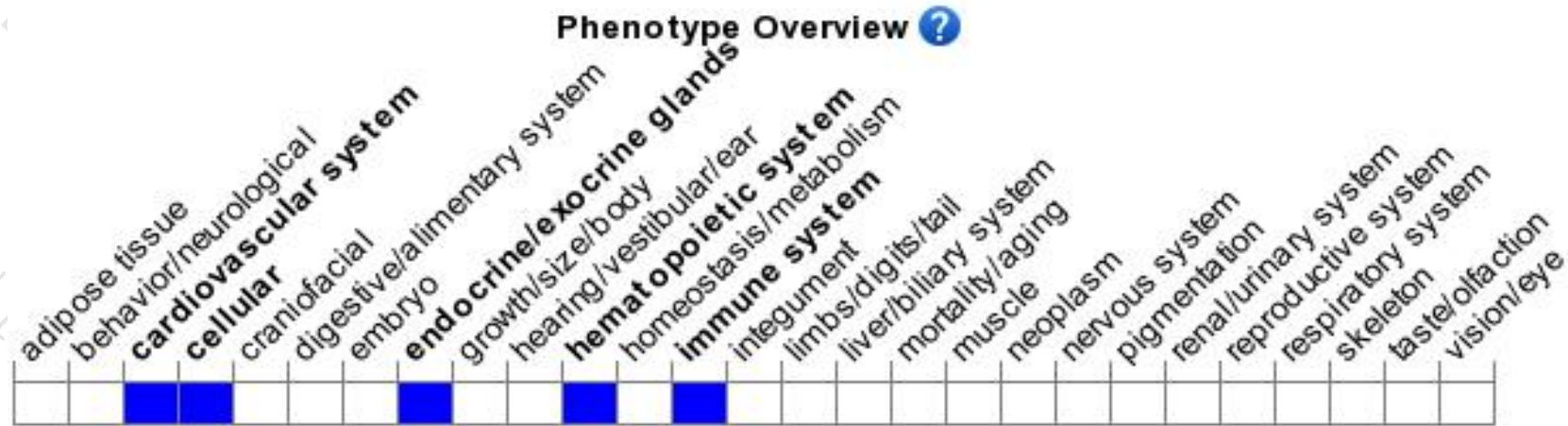
Genomic location distribution



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 severe thymus hypoplasia, abnormal thymocyte development, and impaired expansion of immature T lymphocytes.

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

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