

Ccna1 Cas9-CKO Strategy

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Project Overview

Project Name

Ccna1

Project type

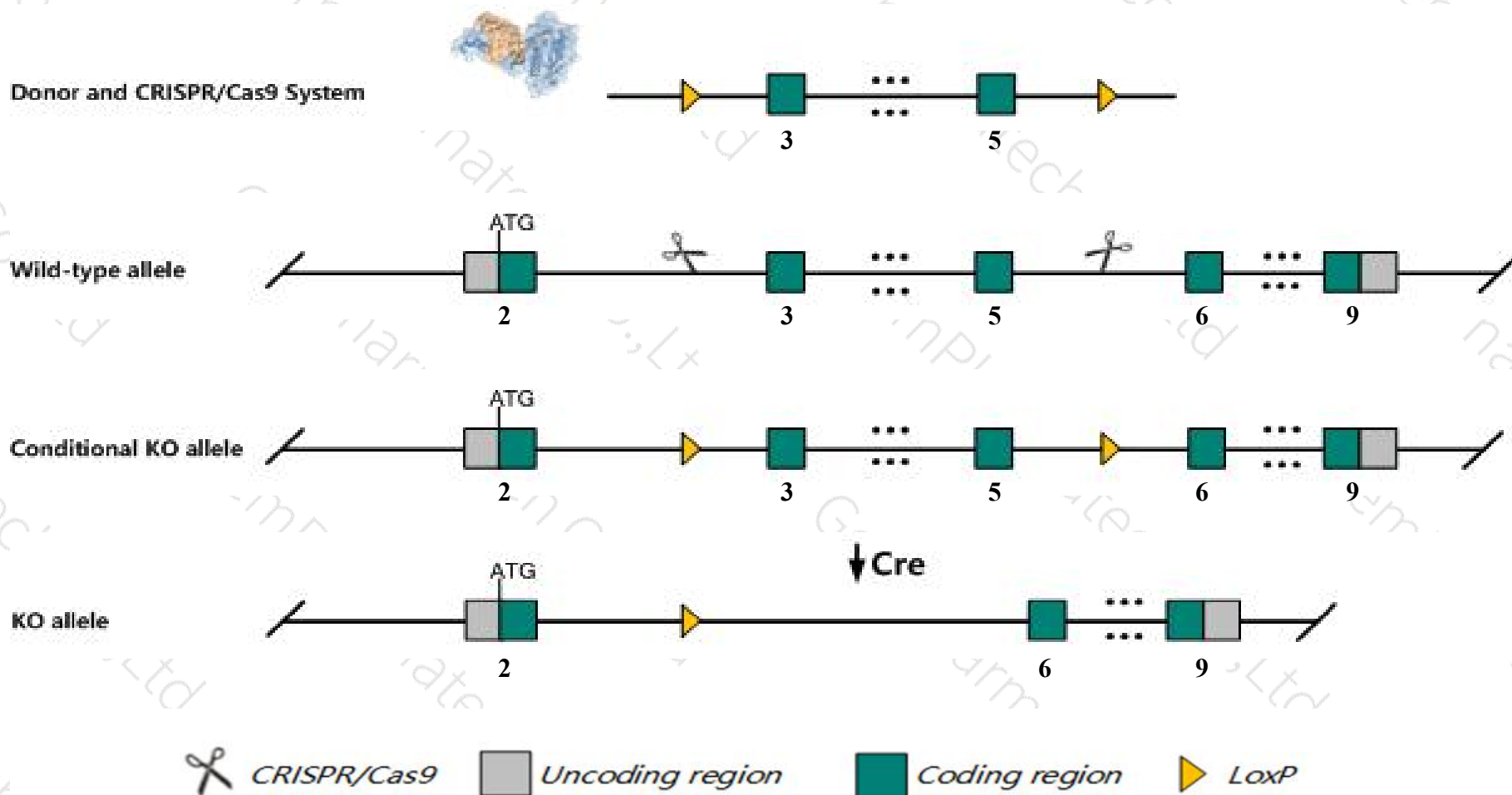
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Ccna1* gene. The schematic diagram is as follows:



- The *Ccna1* gene has 6 transcripts. According to the structure of *Ccna1* gene, exon3-exon5 of *Ccna1*-202 (ENSMUST00000197238.4) transcript is recommended as the knockout region. The region contains 596bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Ccna1* 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, homozygous null males are infertile due to the arrest of spermatogenesis prior to the first meiotic division. Female mutant mice are fertile.
- This strategy may affect the 5 terminal regulatory function of *4931419H13Rik* gene.
- The *Ccnal* gene is located on the Chr3. 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)

Ccna1 cyclin A1 [*Mus musculus* (house mouse)]

Gene ID: 12427, updated on 14-Aug-2019

Summary

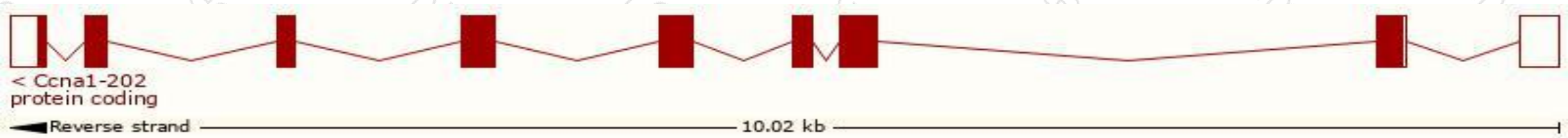
Official Symbol	Ccna1 provided by MGI
Official Full Name	cyclin A1 provided by MGI
Primary source	MGI:MGI:108042
See related	Ensembl:ENSMUSG000000027793
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Expression	Biased expression in testis adult (RPKM 38.8) and limb E14.5 (RPKM 0.7) See more
Orthologs	human all

Transcript information (Ensembl)

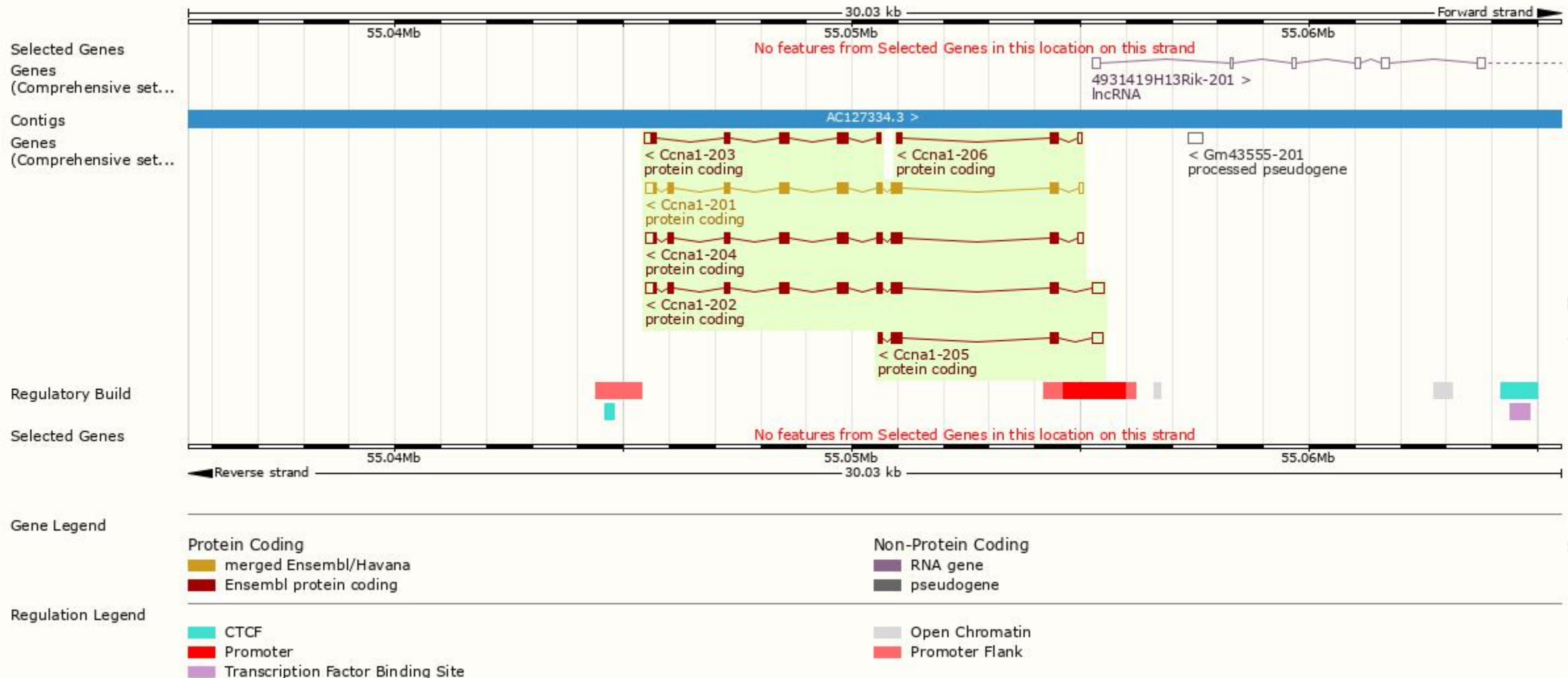
The gene has 6 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Ccna1-202	ENSMUST00000197238.4	1719	421aa	Protein coding	CCDS17356	Q61456	TSL:5 GENCODE basic APPRIS P1
Ccna1-204	ENSMUST00000198320.4	1564	421aa	Protein coding	CCDS17356	Q61456	TSL:1 GENCODE basic APPRIS P1
Ccna1-201	ENSMUST00000029368.6	1560	421aa	Protein coding	CCDS17356	Q61456	TSL:1 GENCODE basic APPRIS P1
Ccna1-206	ENSMUST00000199352.1	391	93aa	Protein coding	-	A0A0G2JGG4	CDS 3' incomplete TSL:5
Ccna1-205	ENSMUST00000199144.4	749	165aa	Protein coding	-	A0A0G2JFR4	CDS 3' incomplete TSL:5
Ccna1-203	ENSMUST00000198102.4	876	250aa	Protein coding	-	A0A0G2JEB5	CDS 5' incomplete TSL:3

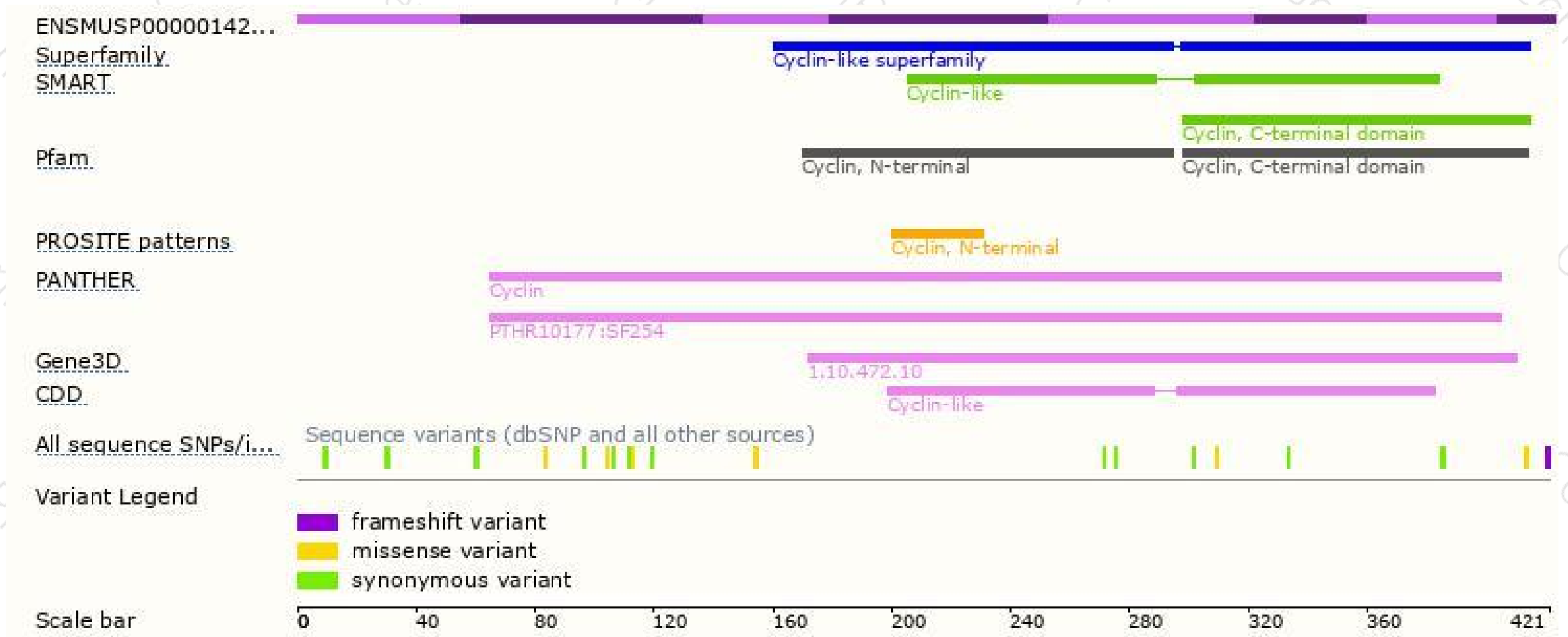
The strategy is based on the design of *Ccna1*-202 transcript,The transcription is shown below



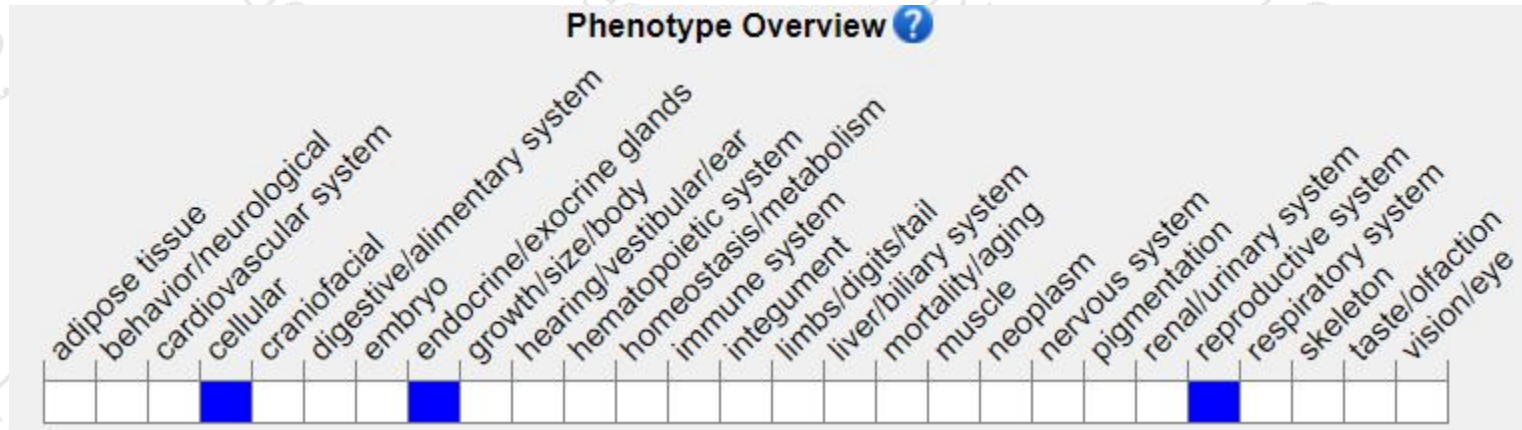
Genomic location distribution



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, homozygous null males are infertile due to the arrest of spermatogenesis prior to the first meiotic division. Female mutant mice are fertile.

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

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