

Ccnd2 Cas9-CKO Strategy

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Project Overview

Project Name

Ccnd2

Project type

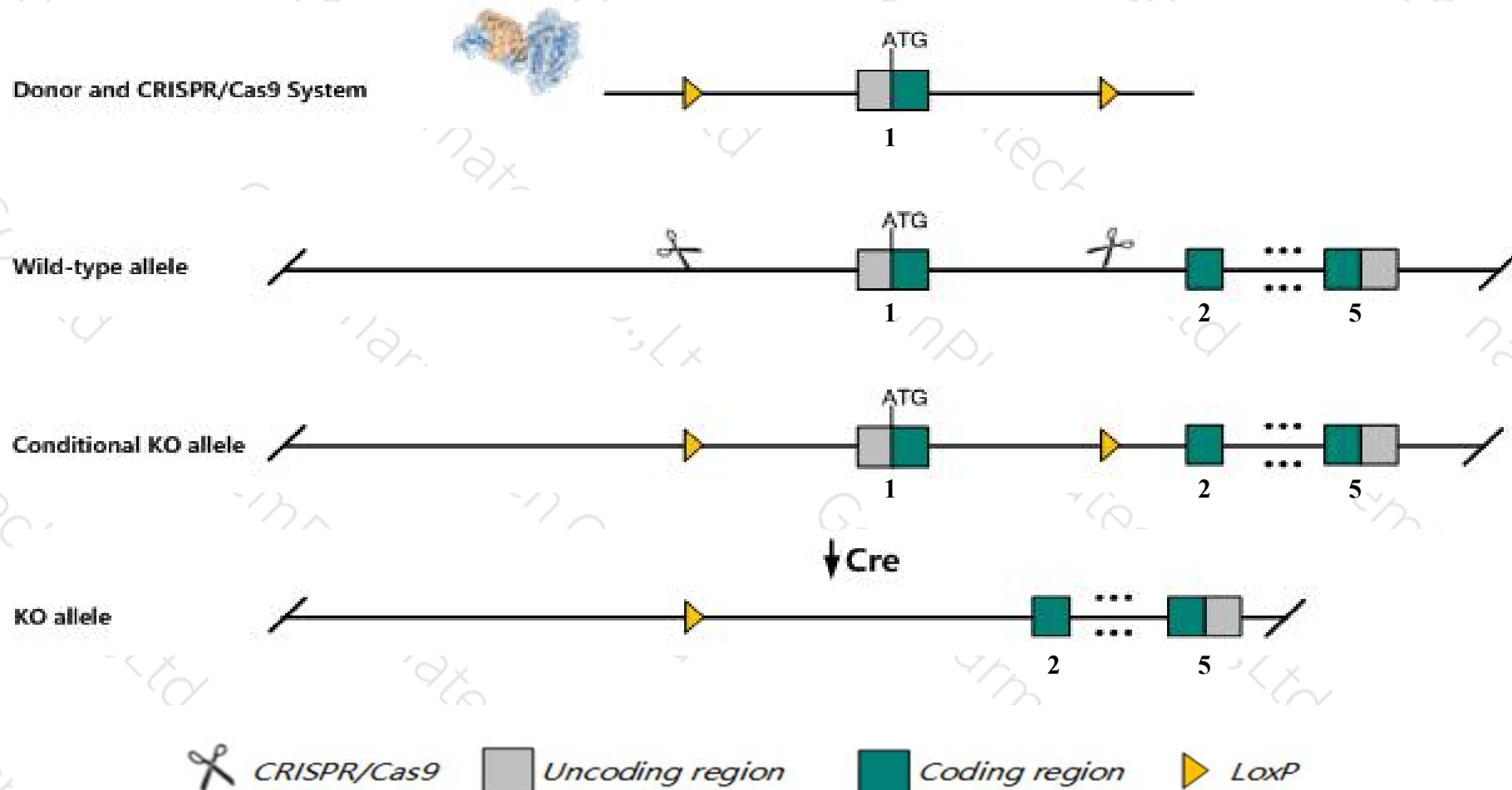
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Ccnd2* gene. The schematic diagram is as follows:



Technical routes

- The *Ccnd2* gene has 8 transcripts. According to the structure of *Ccnd2* gene, exon1 of *Ccnd2-201* (ENSMUST00000000188.11) 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 *Ccnd2* 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, Homozygotes for a targeted null mutation are sterile: females lack a granulosa cell response to follicle stimulating hormone, while males have hypoplastic testes. Mutants also show decreased cerebellar granule cell and stellate neuron populations.
- The KO region contains intron of the *9330179D12Rik* gene. Knockout the region may affect the splicing function of *9330179D12Rik* gene
- The *Ccnd2* gene is located on the Chr6. 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)

Ccnd2 cyclin D2 [*Mus musculus* (house mouse)]

Gene ID: 12444, updated on 11-Sep-2019

Summary



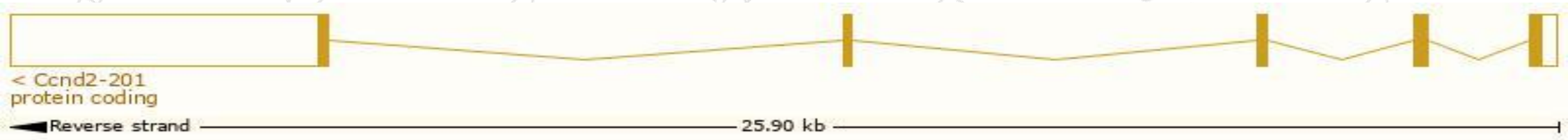
Official Symbol	Ccnd2 provided by MGI
Official Full Name	cyclin D2 provided by MGI
Primary source	MGI:MGI:88314
See related	Ensembl:ENSMUSG00000000184
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	cD2; Vin1; Vin-1; C86853; A1256817; BF642806; 2600016F06Rik
Expression	Broad expression in CNS E11.5 (RPKM 77.3), limb E14.5 (RPKM 41.5) and 22 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

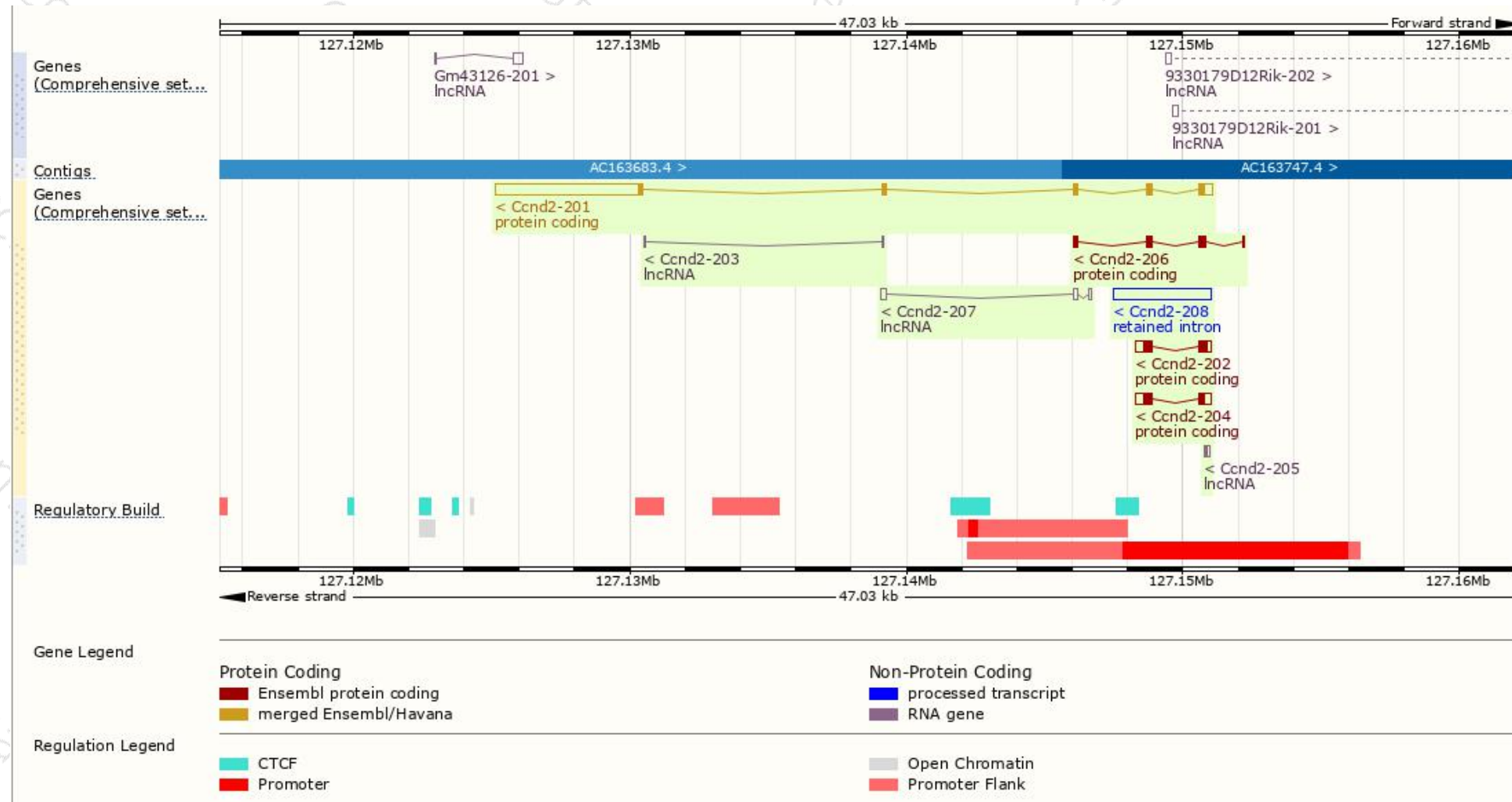
The gene has 8 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Ccnd2-201	ENSMUST00000000188.11	6330	289aa	Protein coding	CCDS20564	P30280 Q4FK45	TSL:1 GENCODE basic APPRIS P1
Ccnd2-204	ENSMUST00000201637.1	1006	156aa	Protein coding	-	Q9D8L9	TSL:1 GENCODE basic
Ccnd2-202	ENSMUST00000201066.1	983	156aa	Protein coding	-	Q9D8L9	TSL:2 GENCODE basic
Ccnd2-206	ENSMUST00000201902.3	627	189aa	Protein coding	-	A0A0J9YU51	CDS 3' incomplete TSL:5
Ccnd2-208	ENSMUST00000202363.1	3506	No protein	Retained intron	-	-	TSL:NA
Ccnd2-207	ENSMUST00000201985.1	415	No protein	lncRNA	-	-	TSL:2
Ccnd2-203	ENSMUST00000201564.1	127	No protein	lncRNA	-	-	TSL:1
Ccnd2-205	ENSMUST00000201857.1	115	No protein	lncRNA	-	-	TSL:3

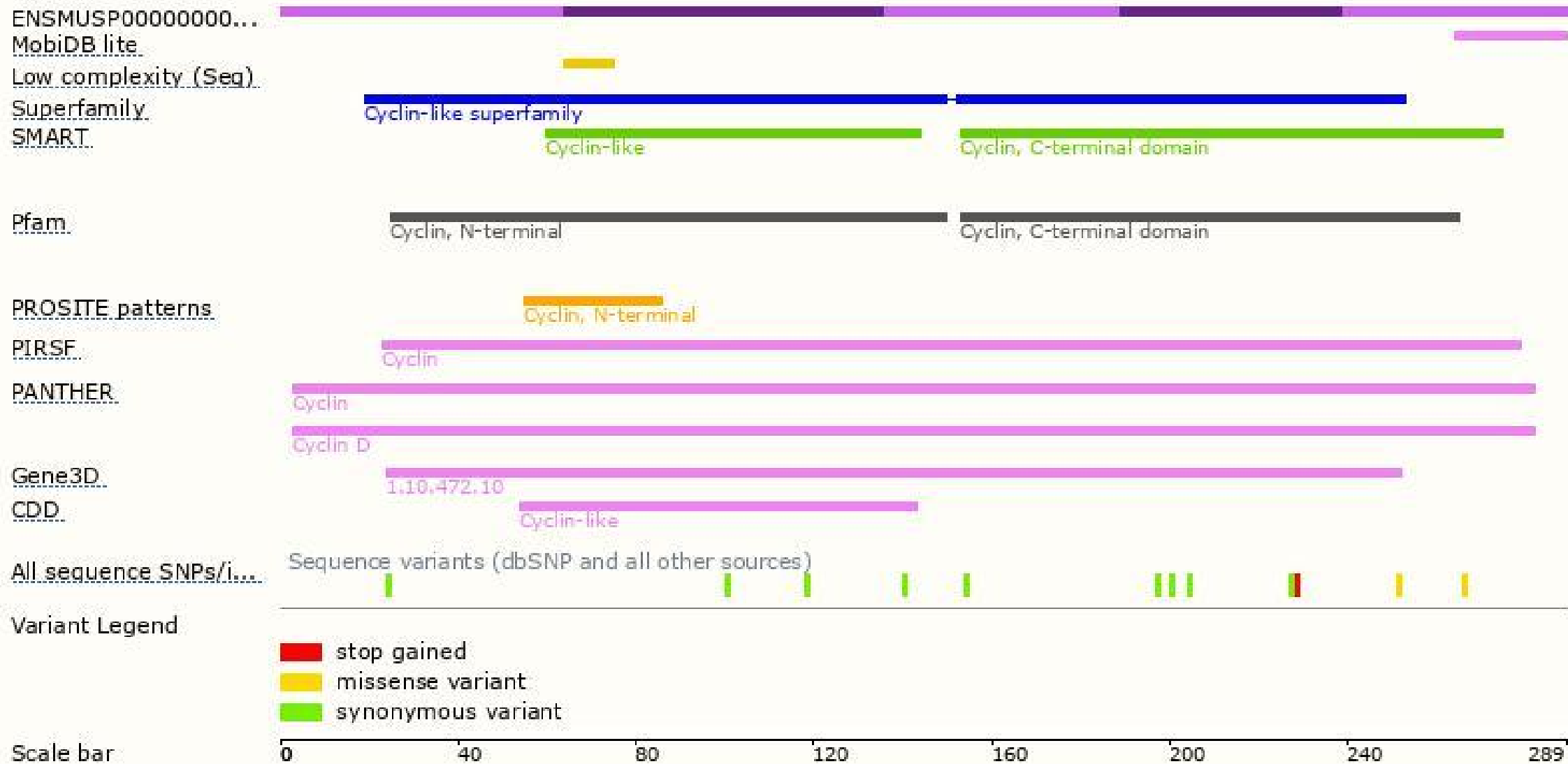
The strategy is based on the design of *Ccnd2-201* transcript,The transcription is shown below



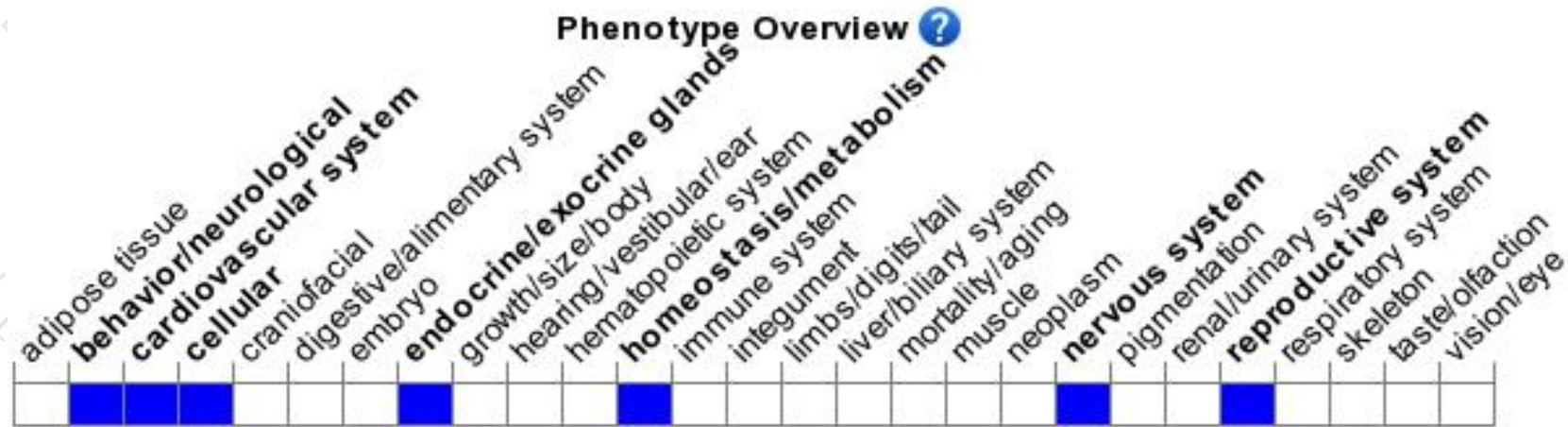
Genomic location distribution



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, Homozygotes for a targeted null mutation are sterile: females lack a granulosa cell response to follicle stimulating hormone, while males have hypoplastic testes. Mutants also show decreased cerebellar granule cell and stellate neuron populations.

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

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