

# *Ccnd1* Cas9-KO Strategy

**Designer:**

**Jinlong Zhao**

**Reviewer:**

**Shilei Zhu**

**Design Date:**

**2018-9-5**

# Project Overview

**Project Name**

***Ccnd1***

**Project type**

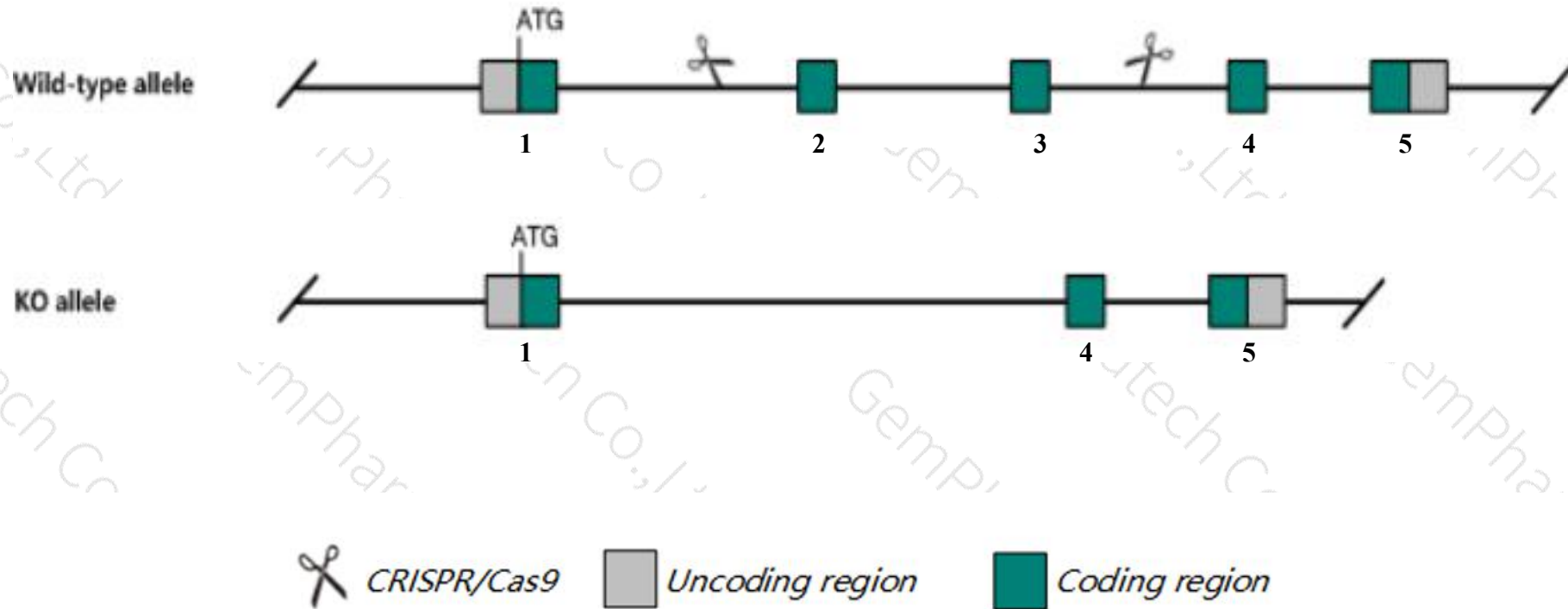
**Cas9-KO**

**Strain background**

**C57BL/6JGpt**

# Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Ccnd1* gene. The schematic diagram is as follows:



- The *Ccnd1* gene has 3 transcripts. According to the structure of *Ccnd1* gene, exon2-exon3 of *Ccnd1-201* (ENSMUST00000093962.4) transcript is recommended as the knockout region. The region contains 376bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Ccnd1* gene. The brief process is as follows: CRISPR/Cas9 system

- According to the existing MGI data, homozygotes for targeted mutations may exhibit reduced body size and viability, impaired retinal development, pregnancy-insensitive mammary glands, and modified development of mammary cancer induced by neu and ras oncogenes, depending on the specific allele or genetic background.
- The *Ccnd1* gene is located on the Chr7. 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)

## Ccnd1 cyclin D1 [Mus musculus (house mouse)]

Gene ID: 12443, updated on 13-Mar-2020

### Summary



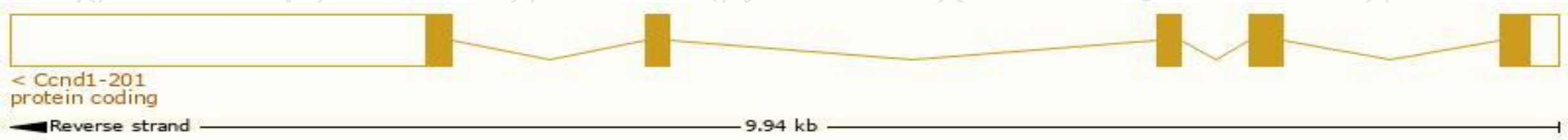
Official Symbol	Ccnd1 provided by <a href="#">MGI</a>
Official Full Name	cyclin D1 provided by <a href="#">MGI</a>
Primary source	<a href="#">MGI:MGI:88313</a>
See related	<a href="#">Ensembl:ENSMUSG00000070348</a>
Gene type	protein coding
RefSeq status	VALIDATED
Organism	<a href="#">Mus musculus</a>
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	AI327039, CycD1, Cyl-1, PRAD1, bcl-1, cD1
Expression	Ubiquitous expression in CNS E11.5 (RPKM 58.4), adrenal adult (RPKM 54.1) and 27 other tissues <a href="#">See more</a>
Orthologs	<a href="#">human</a> <a href="#">all</a>

# Transcript information (Ensembl)

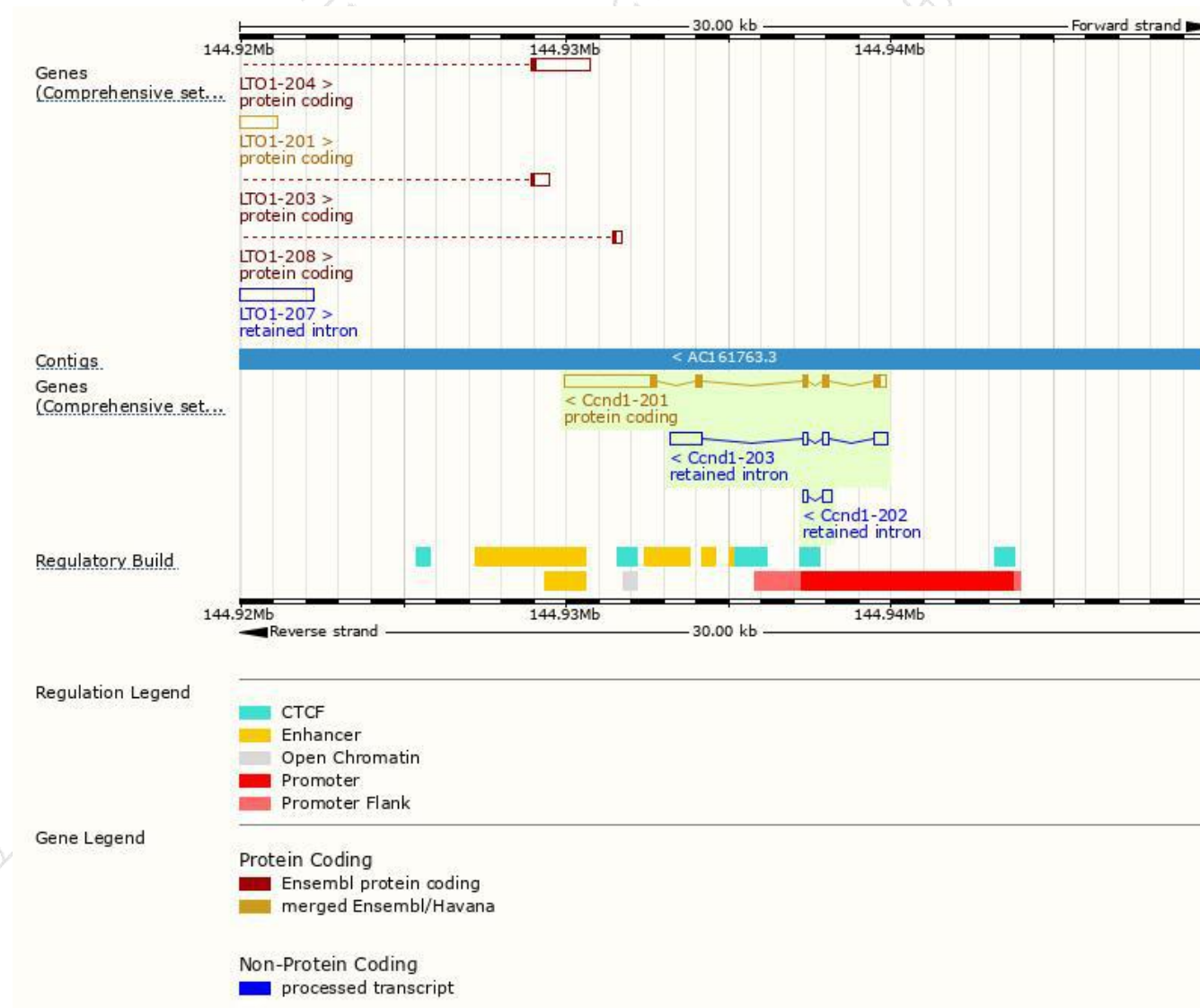
The gene has 3 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Ccnd1-201	<a href="#">ENSMUST00000093962.4</a>	3740	<a href="#">295aa</a>	Protein coding	<a href="#">CCDS22055</a>	<a href="#">P25322 Q790L7</a>	TSL:1 GENCODE basic APPRIS P1
Ccnd1-203	<a href="#">ENSMUST00000208193.1</a>	1773	No protein	Retained intron	-	-	TSL:1
Ccnd1-202	<a href="#">ENSMUST00000135985.1</a>	470	No protein	Retained intron	-	-	TSL:2

The strategy is based on the design of *Ccnd1-201* transcript,the transcription is shown below:

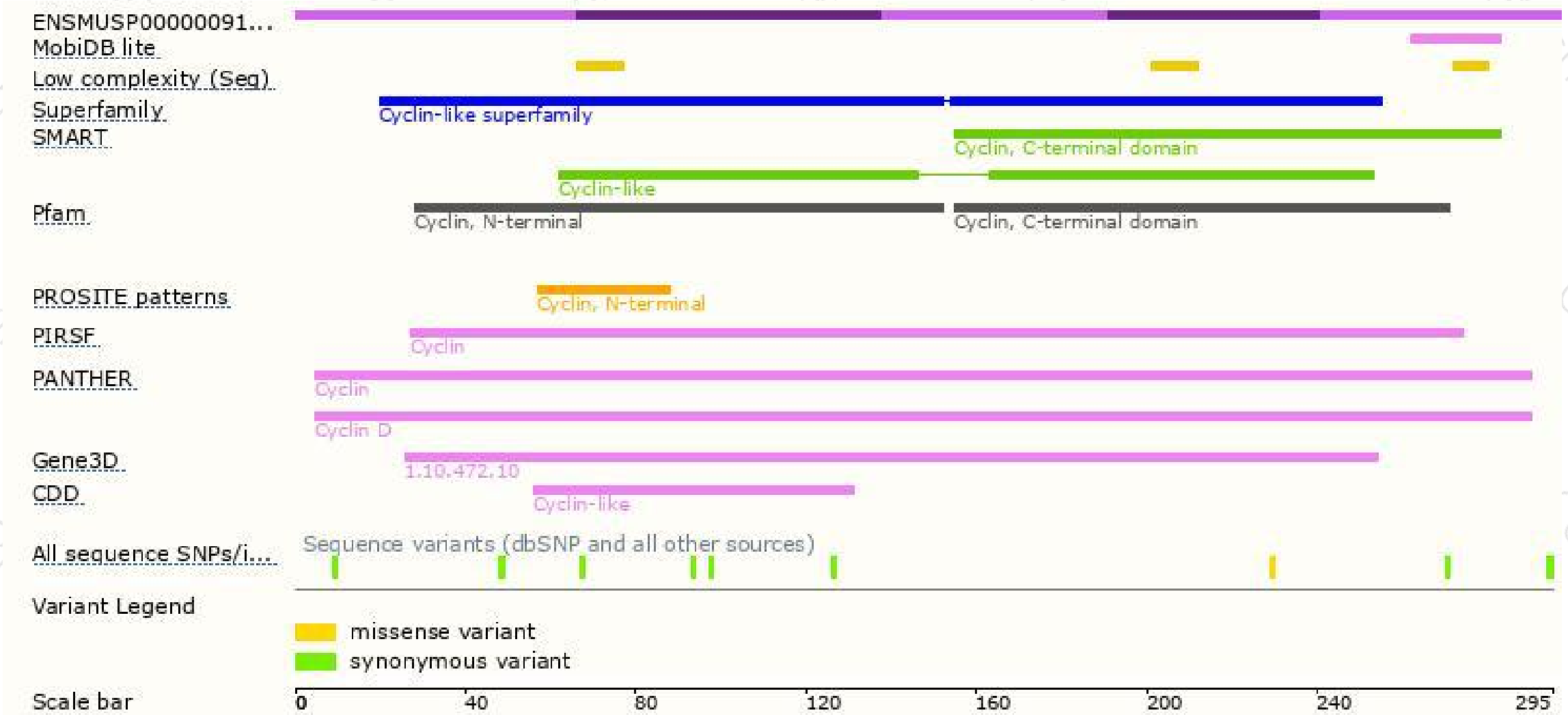


# Genomic location distribution

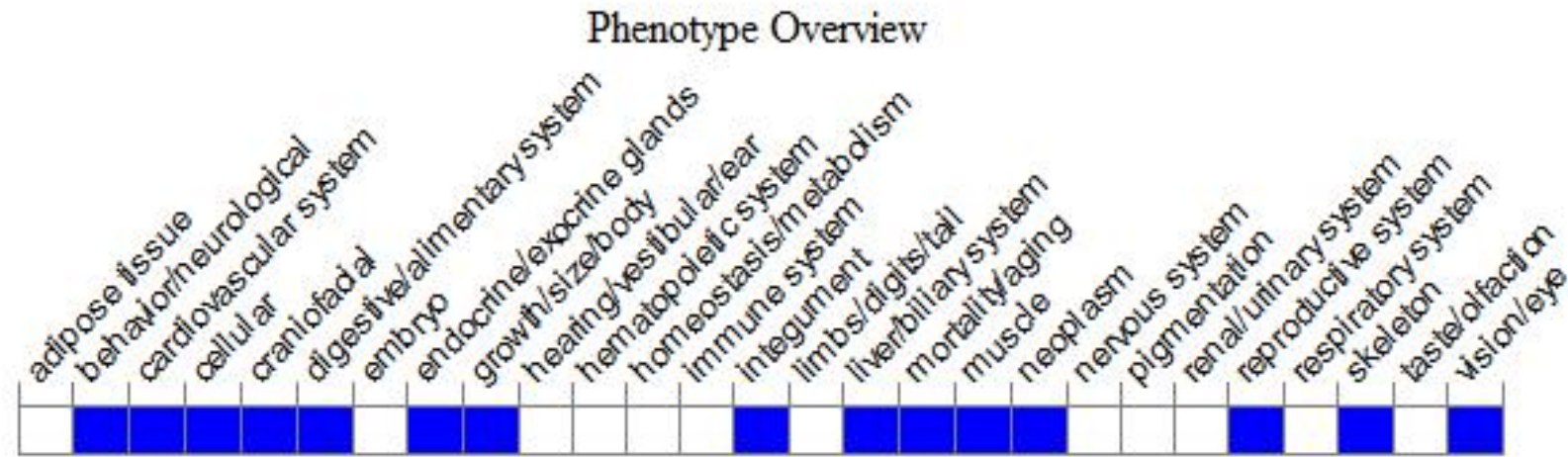




# Protein domain



# 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 targeted mutations may exhibit reduced body size and viability, impaired retinal development, pregnancy-insensitive mammary glands, and modified development of mammary cancer induced by neu and ras oncogenes, depending on the specific allele or genetic background.

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

Tel: 400-9660890

