

# ***Cnot1* Cas9-KO Strategy**

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**Reviewer: Ruiuri Zhang**

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# Project Overview

**Project Name**

***Cnot1***

**Project type**

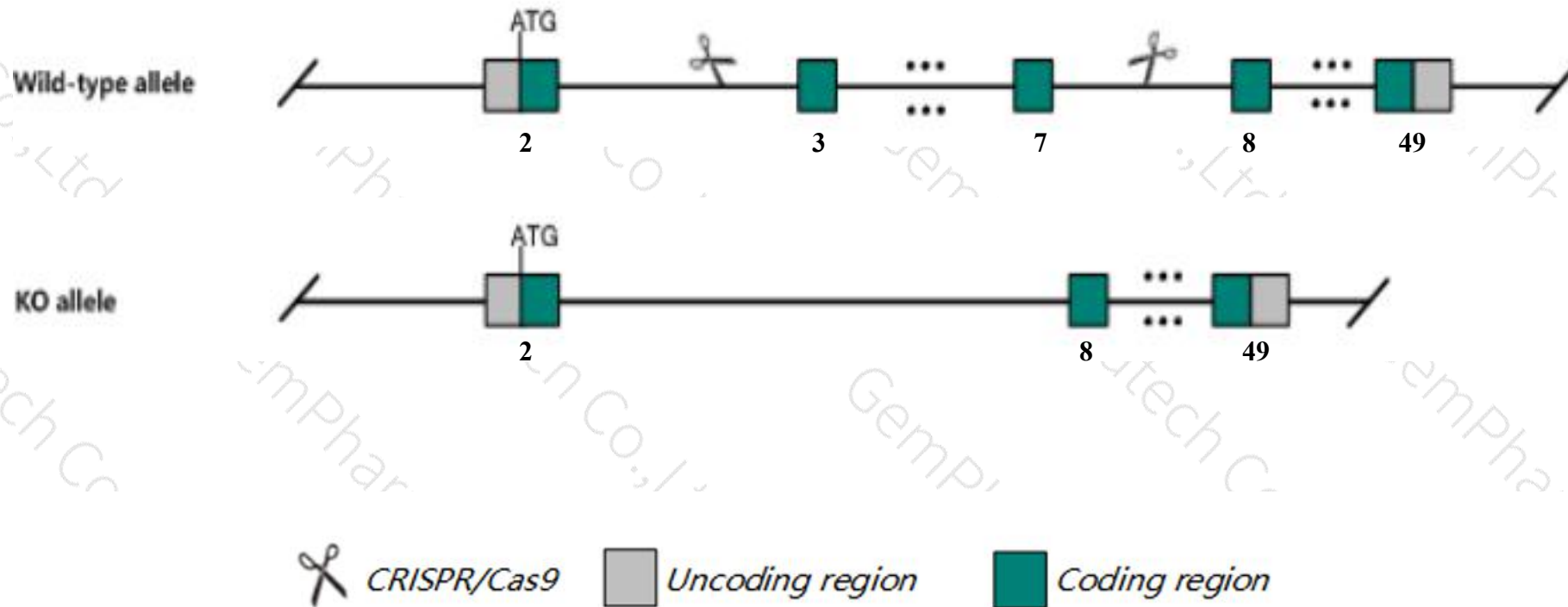
**Cas9-KO**

**Strain background**

**C57BL/6JGpt**

# Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Cnot1* gene. The schematic diagram is as follows:



- The *Cnot1* gene has 17 transcripts. According to the structure of *Cnot1* gene, exon3-exon7 of *Cnot1*-203 (ENSMUST00000211887.1) transcript is recommended as the knockout region. The region contains 529bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Cnot1* gene. The brief process is as follows: CRISPR/Cas9 system

- According to the existing MGI data, mice homozygous for a conditional allele activated in cardiomyocytes exhibit postnatal lethality, decreased cardiac muscle contractility, prolonged qt interval and cardiac muscle cell death.
- The 3-regulation of *Gm45762-201* may be affected.
- *Cnot1-217* and *Cnot1-205* transcripts are unknown, and the effect on these two transcripts is unknown.
- The *Cnot1* gene is located on the Chr8. If the knockout mice are crossed with other mouse 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)

## Cnot1 CCR4-NOT transcription complex, subunit 1 [ *Mus musculus* (house mouse) ]

Gene ID: 234594, updated on 8-Jun-2020

### Summary



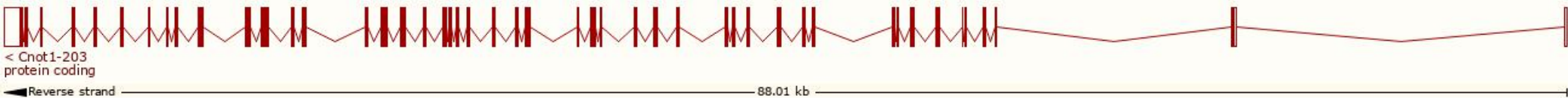
Official Symbol	Cnot1 provided by <a href="#">MGI</a>
Official Full Name	CCR4-NOT transcription complex, subunit 1 provided by <a href="#">MGI</a>
Primary source	<a href="#">MGI:MGI:2442402</a>
See related	<a href="#">Ensembl:ENSMUSG000000036550</a>
Gene type	protein coding
RefSeq status	VALIDATED
Organism	<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	AA815922; D830048B13; 6030411K04Rik
Expression	Ubiquitous expression in testis adult (RPKM 29.9), placenta adult (RPKM 21.5) and 28 other tissues <a href="#">See more</a>
Orthologs	<a href="#">human</a> <a href="#">all</a>

# Transcript information (Ensembl)

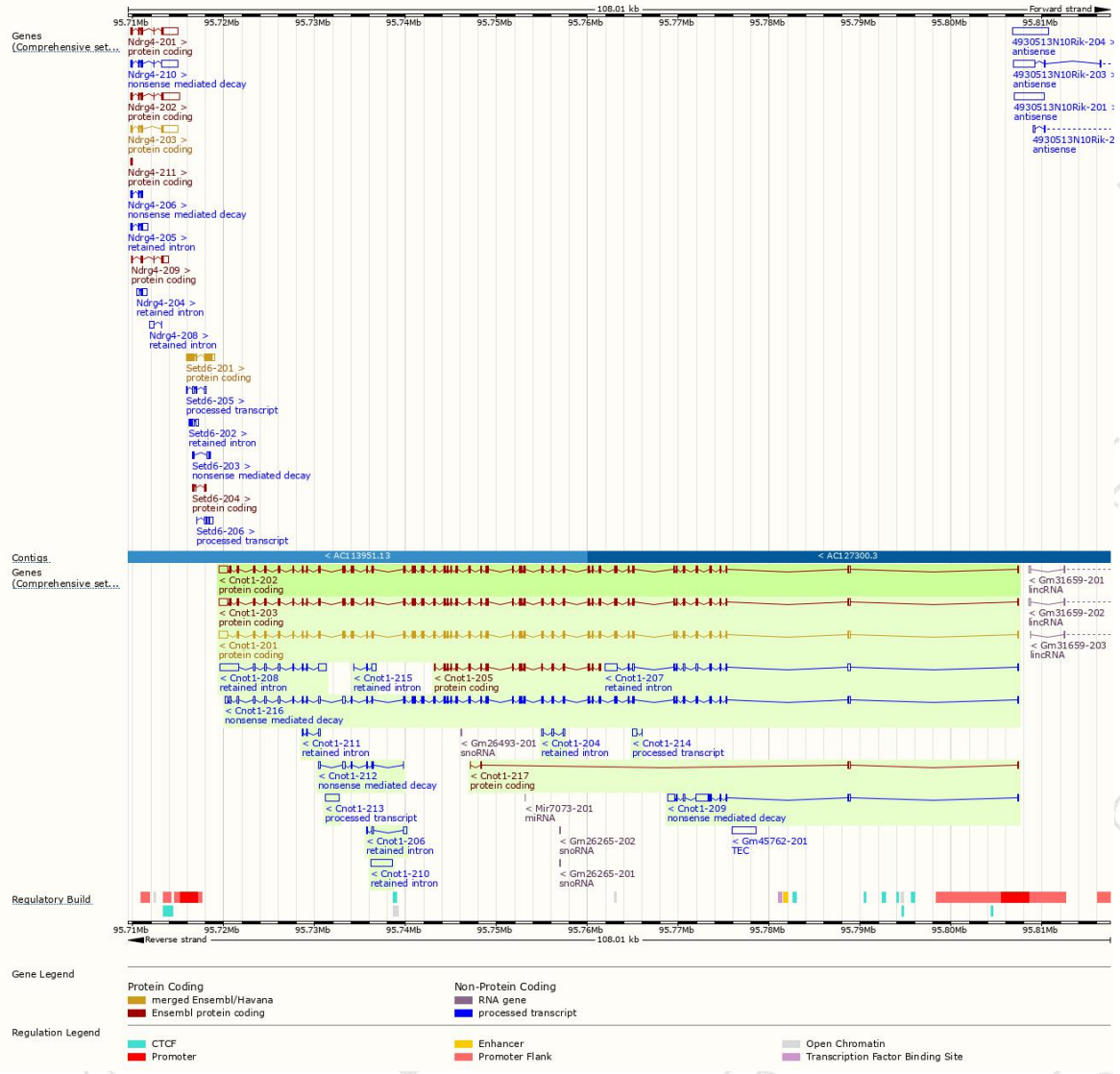
The gene has 17 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Cnot1-203	<a href="#">ENSMUST00000211887.1</a>	8364	<a href="#">2369aa</a>	Protein coding	<a href="#">CCDS85589</a>	<a href="#">A0A1D5RMJ8</a>	TSL:1 Gencode basic APPRIS P2
Cnot1-201	<a href="#">ENSMUST0000068452.9</a>	8152	<a href="#">2326aa</a>	Protein coding	<a href="#">CCDS57635</a>	<a href="#">B7ZWL1</a>	TSL:1 Gencode basic
Cnot1-202	<a href="#">ENSMUST00000098473.10</a>	8390	<a href="#">2376aa</a>	Protein coding	-	<a href="#">Q6ZQ08</a>	TSL:5 Gencode basic APPRIS ALT1
Cnot1-205	<a href="#">ENSMUST00000211973.1</a>	2469	<a href="#">823aa</a>	Protein coding	-	<a href="#">A0A1D5RML9</a>	CDS 5' and 3' incomplete TSL:5
Cnot1-217	<a href="#">ENSMUST00000213046.1</a>	550	<a href="#">92aa</a>	Protein coding	-	<a href="#">A0A1D5RMB6</a>	CDS 3' incomplete TSL:3
Cnot1-216	<a href="#">ENSMUST00000213006.1</a>	7479	<a href="#">1614aa</a>	Nonsense mediated decay	-	<a href="#">A0A1D5RMD8</a>	TSL:1
Cnot1-209	<a href="#">ENSMUST00000212323.1</a>	3277	<a href="#">213aa</a>	Nonsense mediated decay	-	<a href="#">A0A1D5RM03</a>	TSL:2
Cnot1-212	<a href="#">ENSMUST00000212415.1</a>	956	<a href="#">122aa</a>	Nonsense mediated decay	-	<a href="#">A0A1D5RM04</a>	CDS 5' incomplete TSL:5
Cnot1-213	<a href="#">ENSMUST00000212535.1</a>	1546	No protein	Processed transcript	-	-	TSL:NA
Cnot1-214	<a href="#">ENSMUST00000212556.1</a>	521	No protein	Processed transcript	-	-	TSL:5
Cnot1-208	<a href="#">ENSMUST00000212302.1</a>	3809	No protein	Retained intron	-	-	TSL:1
Cnot1-207	<a href="#">ENSMUST00000212228.1</a>	2925	No protein	Retained intron	-	-	TSL:1
Cnot1-210	<a href="#">ENSMUST00000212340.1</a>	2381	No protein	Retained intron	-	-	TSL:NA
Cnot1-206	<a href="#">ENSMUST00000212195.1</a>	696	No protein	Retained intron	-	-	TSL:3
Cnot1-215	<a href="#">ENSMUST00000212712.1</a>	656	No protein	Retained intron	-	-	TSL:3
Cnot1-204	<a href="#">ENSMUST00000211937.1</a>	500	No protein	Retained intron	-	-	TSL:3
Cnot1-211	<a href="#">ENSMUST00000212369.1</a>	479	No protein	Retained intron	-	-	TSL:2

The strategy is based on the design of *Cnot1-203* transcript,the transcription is shown below:

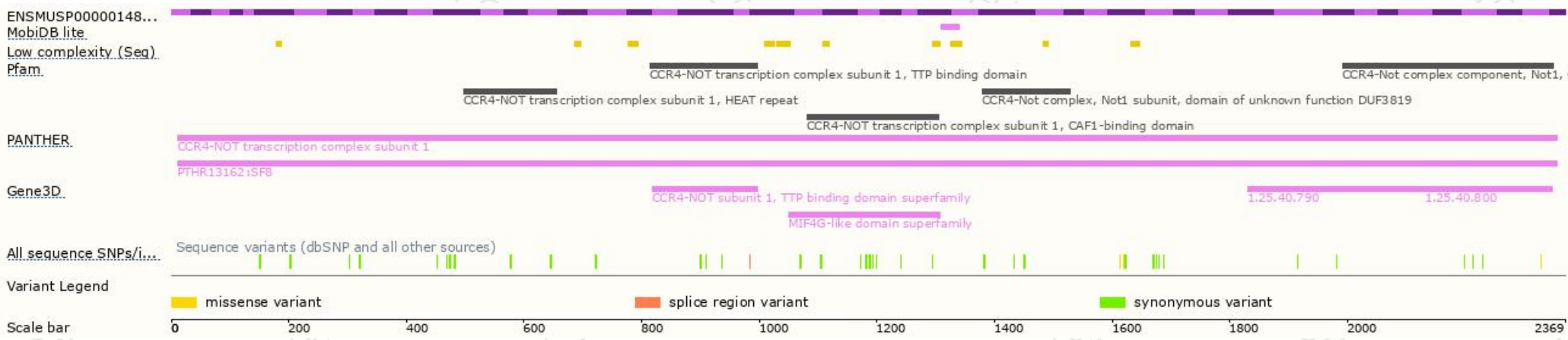


# Genomic location distribution

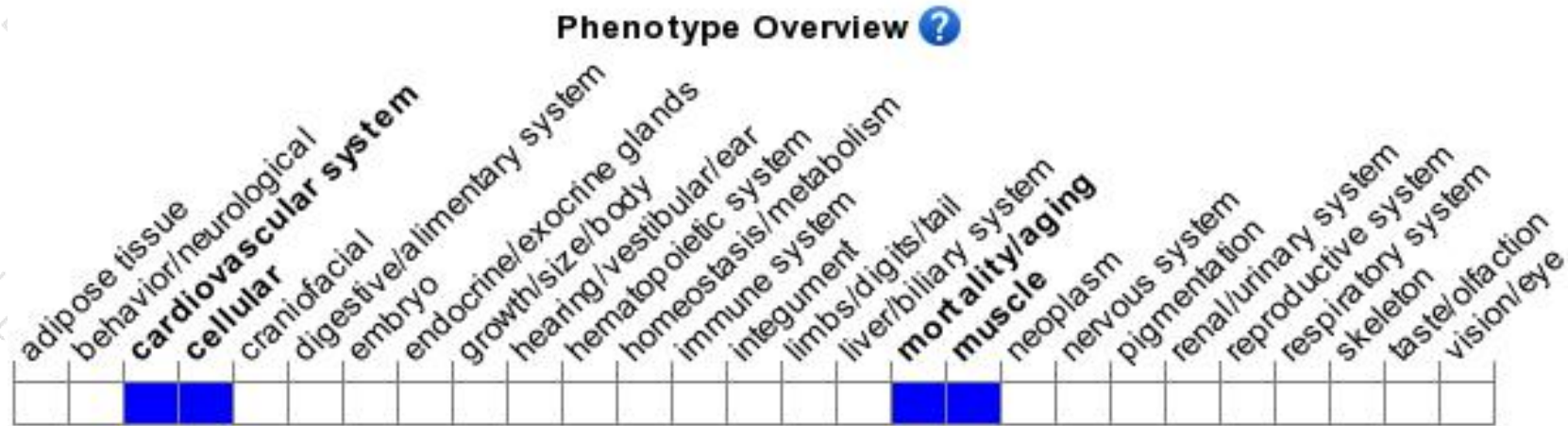




# Protein domain



# 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 conditional allele activated in cardiomyocytes exhibit postnatal lethality, decreased cardiac muscle contractility, prolonged QT interval and cardiac muscle cell death.

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

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