

# *Sem1* Cas9-CKO Strategy

**Designer:**

**Huimin Su**

**Reviewer:**

**Ruirui Zhang**

**Design Date:**

**2020-2-18**

# Project Overview

**Project Name**

*Sem1*

**Project type**

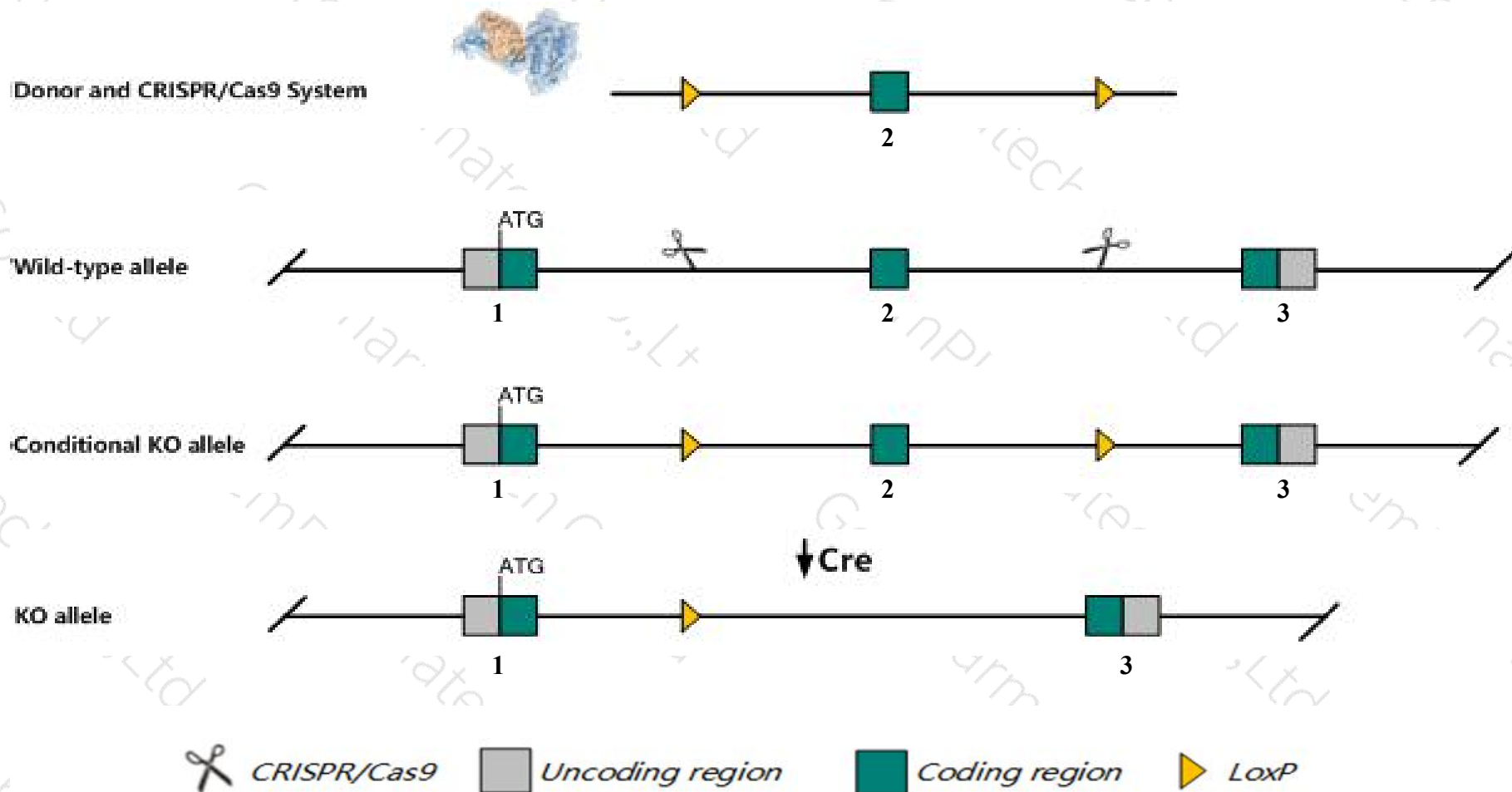
**Cas9-CKO**

**Strain background**

**C57BL/6JGpt**

# Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Sem1* gene. The schematic diagram is as follows:



# Technical routes

- The *Sem1* gene has 2 transcripts. According to the structure of *Sem1* gene, exon2 of *Sem1-201* (ENSMUST00000041111.9) transcript is recommended as the knockout region. The region contains 94bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Sem1* 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.

# Notice

- The *Sem1* 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)

## Sem1 SEM1, 26S proteasome complex subunit [ *Mus musculus* (house mouse) ]

Gene ID: 20422, updated on 14-Aug-2019

### Summary

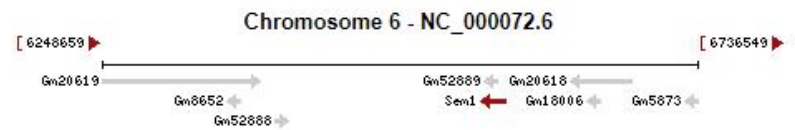
- Official Symbol Sem1 provided by MGI
- Official Full Name SEM1, 26S proteasome complex subunit provided by MGI
- Primary source MGI:MGI:109238
- See related Ensembl:ENSMUSG00000042541
- Gene type protein coding
- RefSeq status VALIDATED
- Organism *Mus musculus*
- Lineage Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
- Also known as DSS1; Shfg; Shfm1; Shfdg1
- Expression Broad expression in CNS E11.5 (RPKM 292.2), placenta adult (RPKM 118.3) and 22 other tissues [See more](#)
- Orthologs [human](#) [all](#)

### Genomic context

Location: 6; 6 A1 [See Sem1 in Genome Data Viewer](#)

Exon count: 3

Annotation release	Status	Assembly	Chr	Location
<a href="#">108</a>	current	GRCm38.p6 ( <a href="#">GCF_000001635.26</a> )	6	NC_000072.6 (6558275..6578658, complement)
Build 37.2	previous assembly	MGSCv37 ( <a href="#">GCF_000001635.18</a> )	6	NC_000072.5 (6508275..6528658, complement)

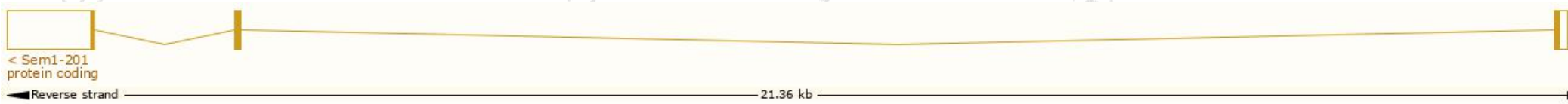


# Transcript information (Ensembl)

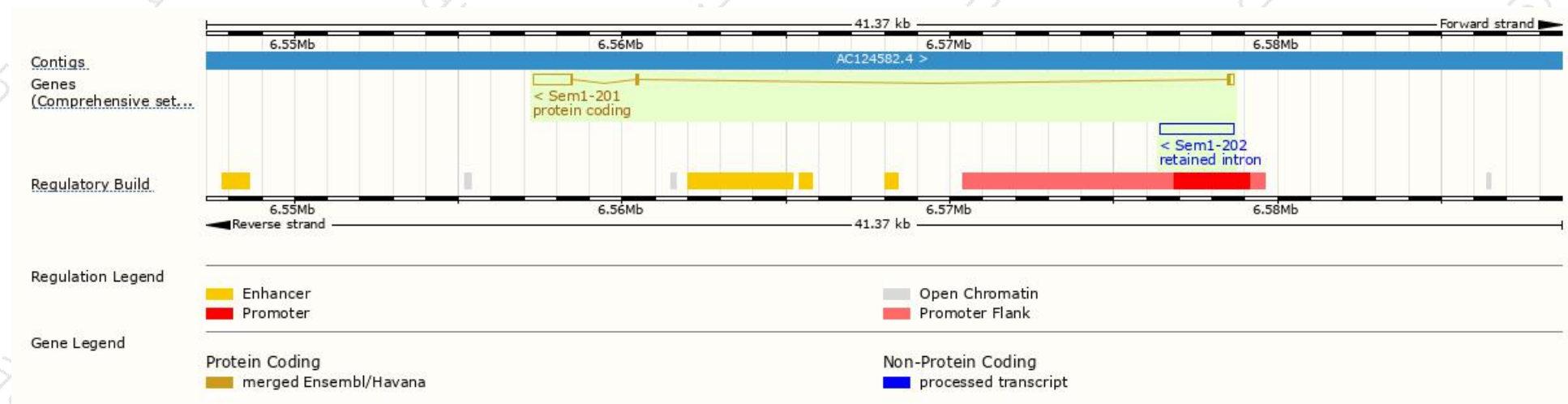
The gene has 2 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Sem1-201	<a href="#">ENSMUST00000041111.9</a>	1472	<a href="#">70aa</a>	Protein coding	<a href="#">CCDS39422</a>	<a href="#">P60897</a> <a href="#">Q3TV35</a>	TSL:1 GENCODE basic APPRIS P1
Sem1-202	<a href="#">ENSMUST00000205180.1</a>	2250	No protein	Retained intron	-	-	TSL:NA

The strategy is based on the design of *Sem1-201* transcript,The transcription is shown below



# Genomic location distribution





# Protein domain



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

Tel: 400-9660890

