

# *Chst3* Cas9-CKO Strategy

**Designer:**

**Huimin Su**

**Reviewer:**

**Ruirui Zhang**

**Design Date:**

**2020-2-19**

# Project Overview

**Project Name**

*Chst3*

**Project type**

**Cas9-CKO**

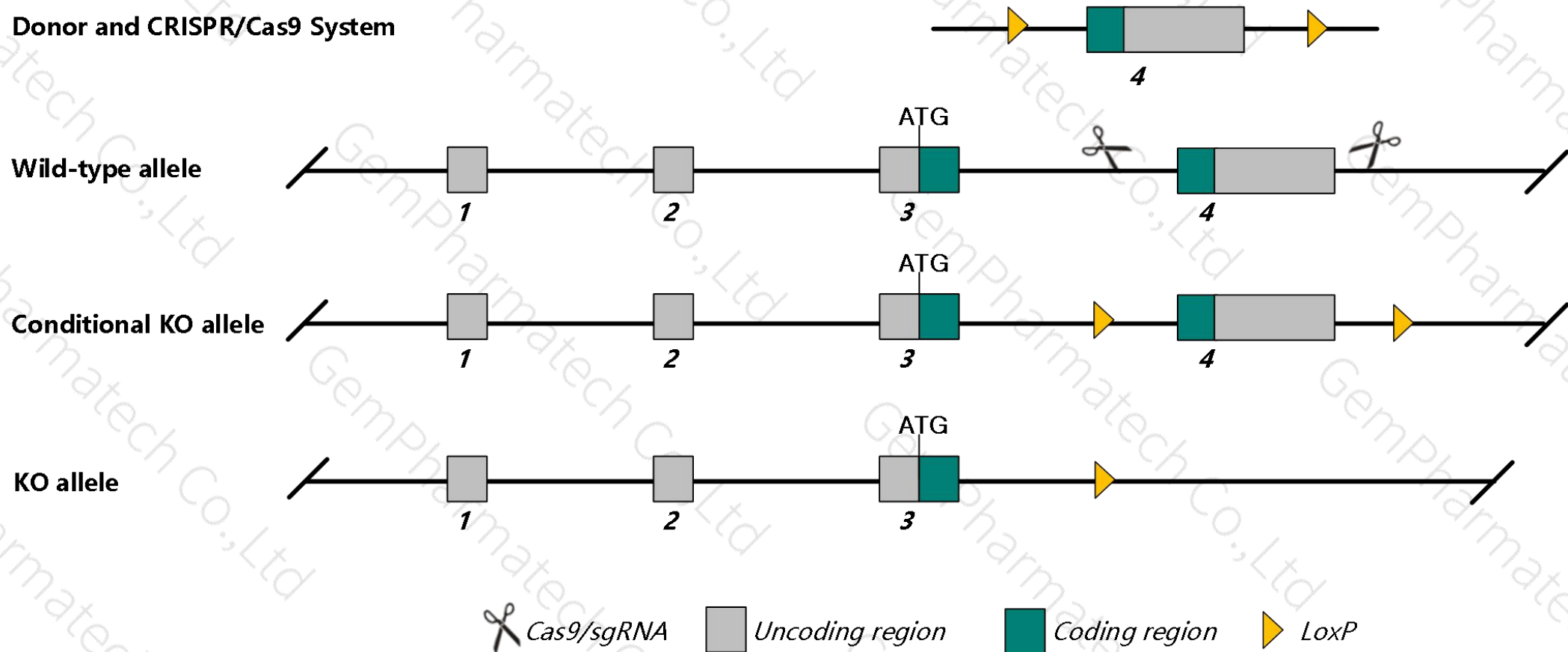
**Strain background**

**C57BL/6JGpt**

# Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Chst3* gene. The schematic diagram is as follows:

## Donor and CRISPR/Cas9 System



# Technical routes

- The *Chst3* gene has 3 transcripts. According to the structure of *Chst3* gene, exon4 of *Chst3*-202 (ENSMUST00000135158.8) transcript is recommended as the knockout region. The region contains most of coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Chst3* 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 date, Homozygous mutation of this gene results in significantly reduced numbers of naive T lymphocytes in the spleen at 5-6 weeks of age. Brain development and morphology is normal in mutant animals but for some alleles behavioral abnormalities are seen.
- The *Chst3* gene is located on the Chr10. 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)

## Chst3 carbohydrate sulfotransferase 3 [ *Mus musculus* (house mouse) ]

Gene ID: 53374, updated on 12-Aug-2019

### Summary

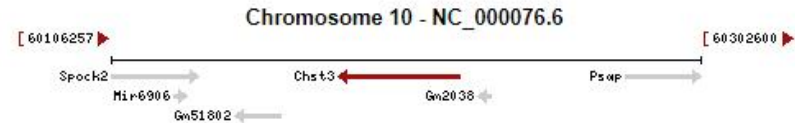
**Official Symbol** Chst3 provided by [MGI](#)  
**Official Full Name** carbohydrate sulfotransferase 3 provided by [MGI](#)  
**Primary source** [MGI:MGI:1858224](#)  
**See related** [Ensembl:ENSMUSG000000057337](#)  
**Gene type** protein coding  
**RefSeq status** VALIDATED  
**Organism** [Mus musculus](#)  
**Lineage** Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus  
**Also known as** C6ST; GST-0; C6ST-1  
**Expression** Biased expression in spleen adult (RPKM 18.8), mammary gland adult (RPKM 4.5) and 5 other tissues [See more](#)  
**Orthologs** [human](#) [all](#)

### Genomic context

**Location:** 10; 10 B4 [See Chst3 in Genome Data Viewer](#)

**Exon count:** 7

Annotation release	Status	Assembly	Chr	Location
<a href="#">108</a>	current	GRCh38.p6 ( <a href="#">GCF_000001635.26</a> )	10	NC_000076.6 (60181527..60222114, complement)
Build 37.2	previous assembly	MGSCv37 ( <a href="#">GCF_000001635.18</a> )	10	NC_000076.5 (59644275..59682008, complement)

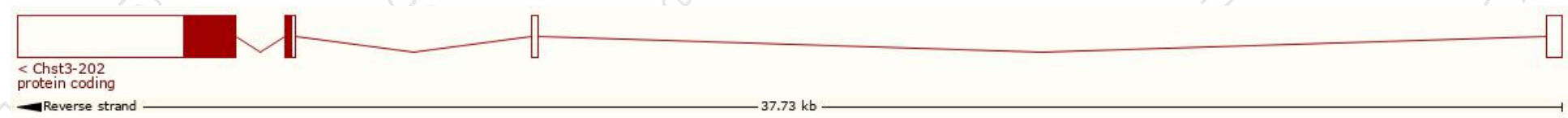


# Transcript information (Ensembl)

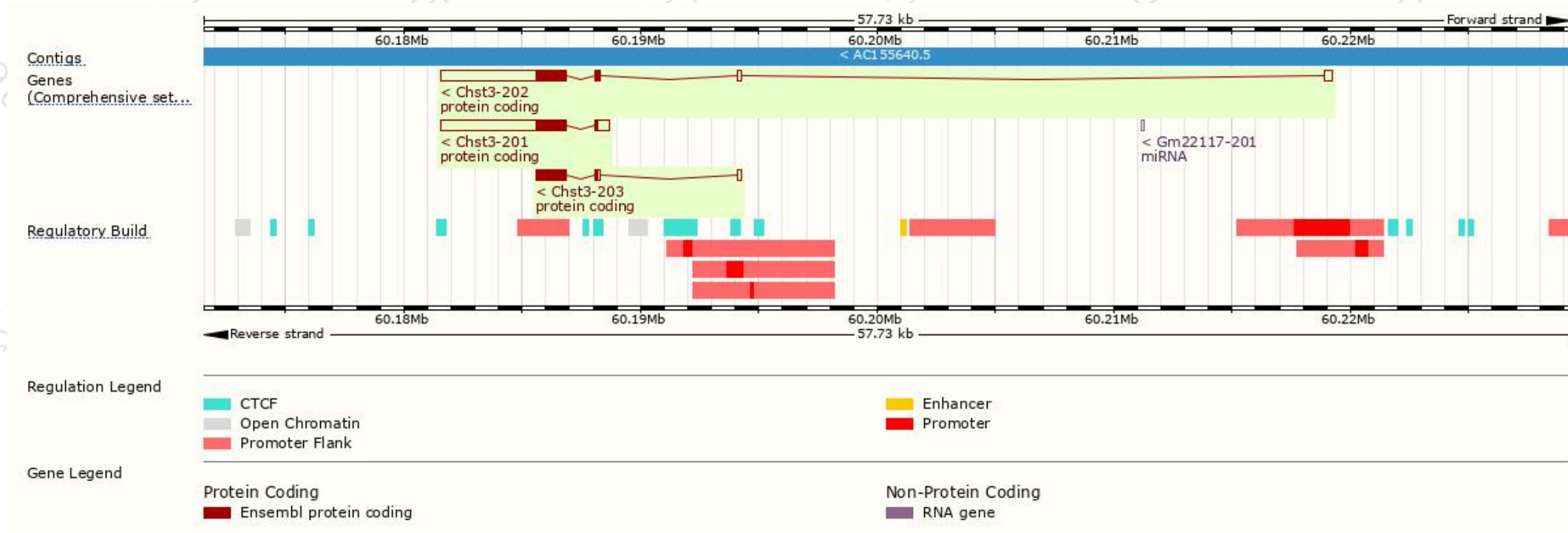
The gene has 3 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Chst3-202	<a href="#">ENSMUST00000135158.8</a>	6108	<a href="#">478aa</a>	Protein coding	<a href="#">CCDS23871</a>	<a href="#">G5E8X5</a>	TSL:5 GENCODE basic APPRIS P2
Chst3-201	<a href="#">ENSMUST00000068690.6</a>	5985	<a href="#">472aa</a>	Protein coding	-	<a href="#">O88199</a>	TSL:1 GENCODE basic APPRIS ALT2
Chst3-203	<a href="#">ENSMUST00000167915.1</a>	1672	<a href="#">472aa</a>	Protein coding	-	<a href="#">O88199</a>	TSL:1 GENCODE basic APPRIS ALT2

The strategy is based on the design of *Chst3-202* transcript,The transcription is shown below

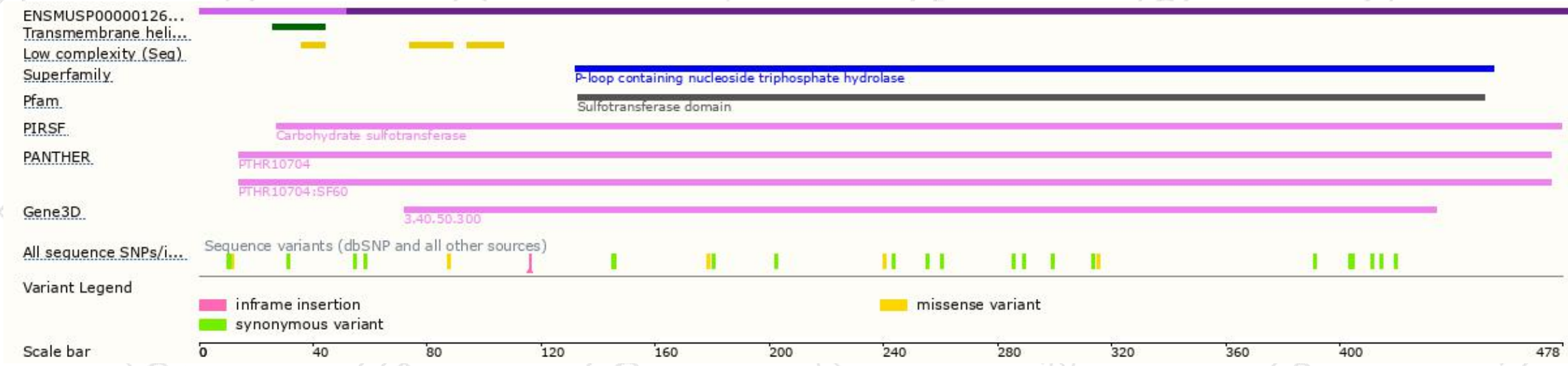


# Genomic location distribution

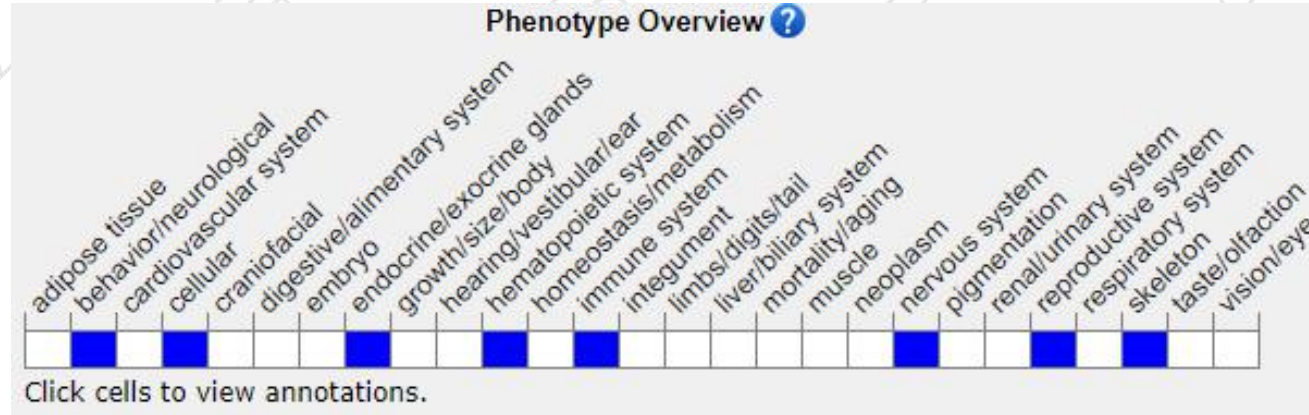




# Protein domain



# Mouse phenotype description(MGI)



*Phenotypes affected by the gene are marked in blue. Data quoted from MGI database(<http://www.informatics.jax.org/>).*

Homozygous mutation of this gene results in significantly reduced numbers of naive T lymphocytes in the spleen at 5-6 weeks of age. Brain development and morphology is normal in mutant animals but for some alleles behavioral abnormalities are seen.

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

Tel: 400-9660890

