

Catsper1 Cas9-CKO Strategy

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Design Date: 2019-8-23

Project Overview

Project Name

Catsper1

Project type

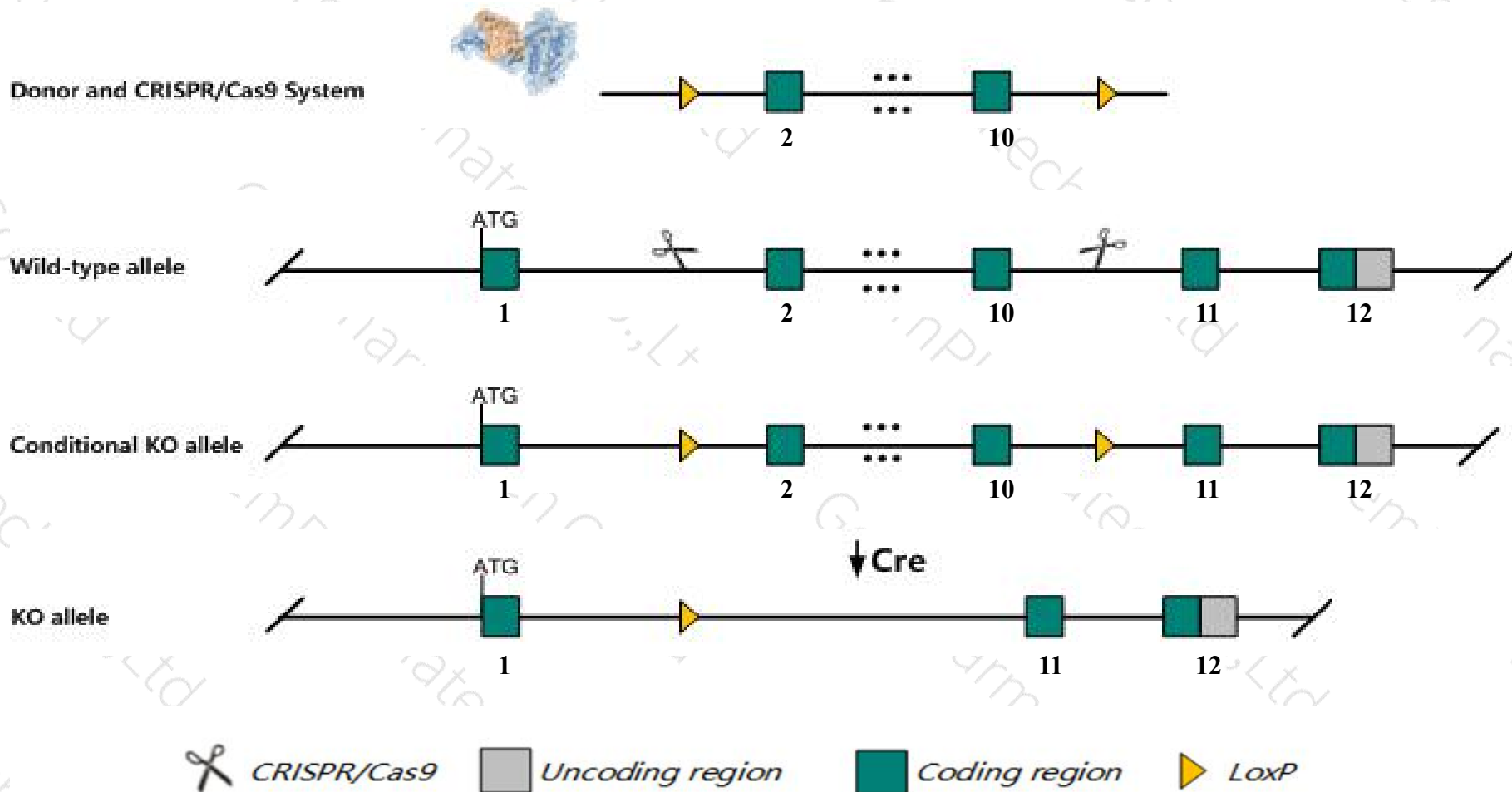
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Catsper1* gene. The schematic diagram is as follows:



- The *Catsper1* gene has 2 transcripts. According to the structure of *Catsper1* gene, exon2-exon10 of *Catsper1-201* (ENSMUST00000043380.4) transcript is recommended as the knockout region. The region contains 985bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Catsper1* 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 exhibit sperm with markedly decreased motility that are unable to fertilize ova and lack a calcium ion influx response to cyclic-AMP.
- The N-terminal of *Catsper1* gene will remain 312aa, it may remain the partial function of *Catsper1* gene.
- The *Catsper1* gene is located on the Chr19. 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)

Catsper1 cation channel, sperm associated 1 [*Mus musculus* (house mouse)]

Gene ID: 225865, updated on 3-Sep-2019

Summary

Official Symbol Catsper1 provided by [MGI](#)
Official Full Name cation channel, sperm associated 1 provided by [MGI](#)
Primary source [MGI:MGI:2179947](#)
See related [Ensembl:ENSMUSG00000038498](#)
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 KSper; Catsper
Expression Restricted expression toward testis adult (RPKM 93.8) [See more](#)
Orthologs [human](#) [all](#)

Genomic context

Location: 19; 19 A

See Catsper1 in [Genome Data Viewer](#)

Exon count: 12

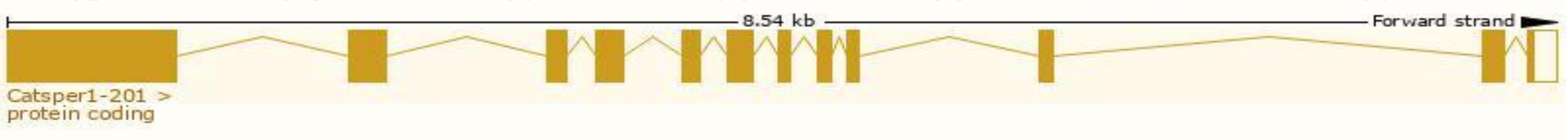
Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	19	NC_000085.6 (5335615..5344281)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	19	NC_000085.5 (5335741..5344153)

Transcript information (Ensembl)

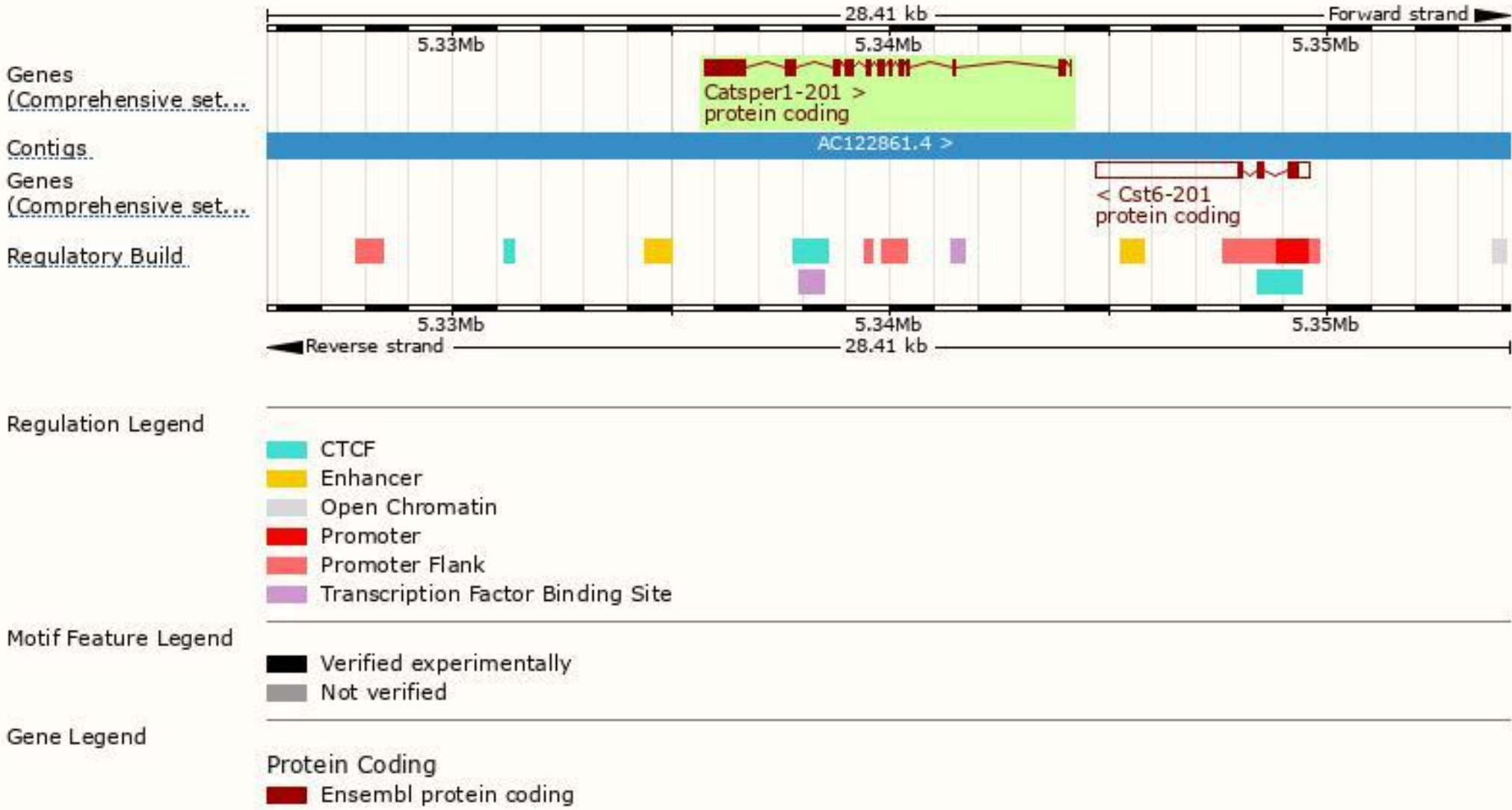
The gene has 2 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Catsper1-201	ENSMUST00000043380.4	2188	686aa	Protein coding	CCDS29456	Q91ZR5	TSL:1 GENCODE basic APPRIS P1
Catsper1-202	ENSMUST00000235380.1	1539	496aa	Protein coding	-	-	CDS 5' incomplete

The strategy is based on the design of *Catsper1-201* transcript,The transcription is shown below



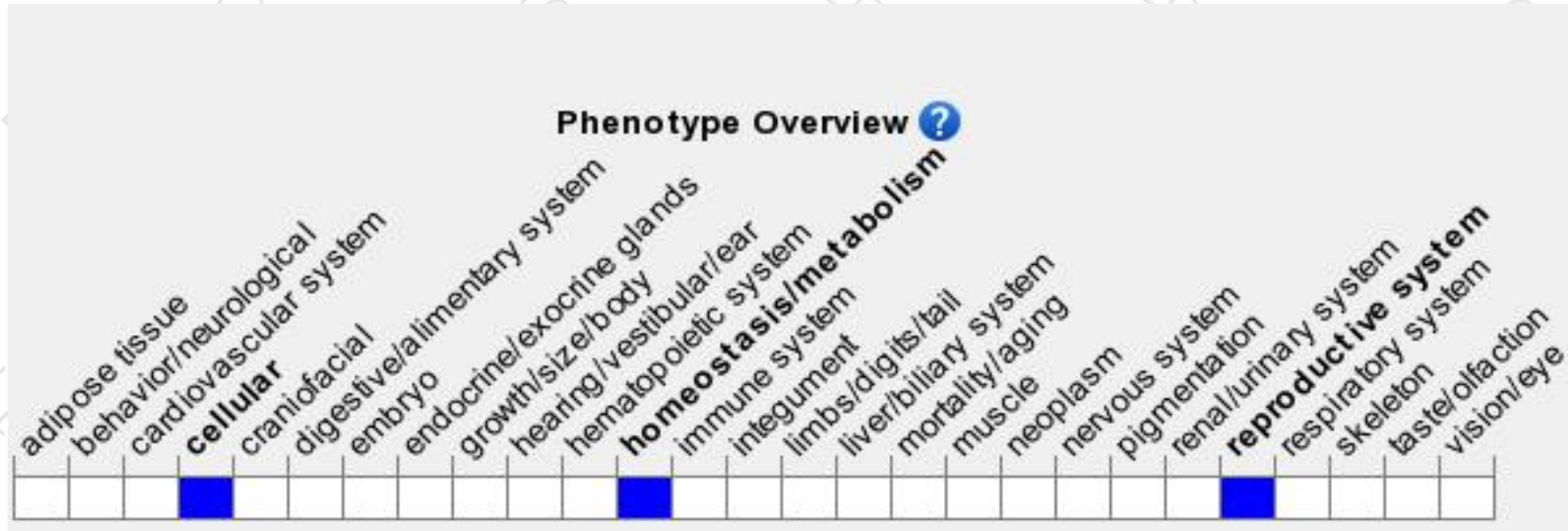
Genomic location distribution



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 exhibit sperm with markedly decreased motility that are unable to fertilize ova and lack a calcium ion influx response to cyclic-AMP.

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

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