

Cd38 Cas9-CKO Strategy

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Project Overview



Project Name

Cd38

Project type

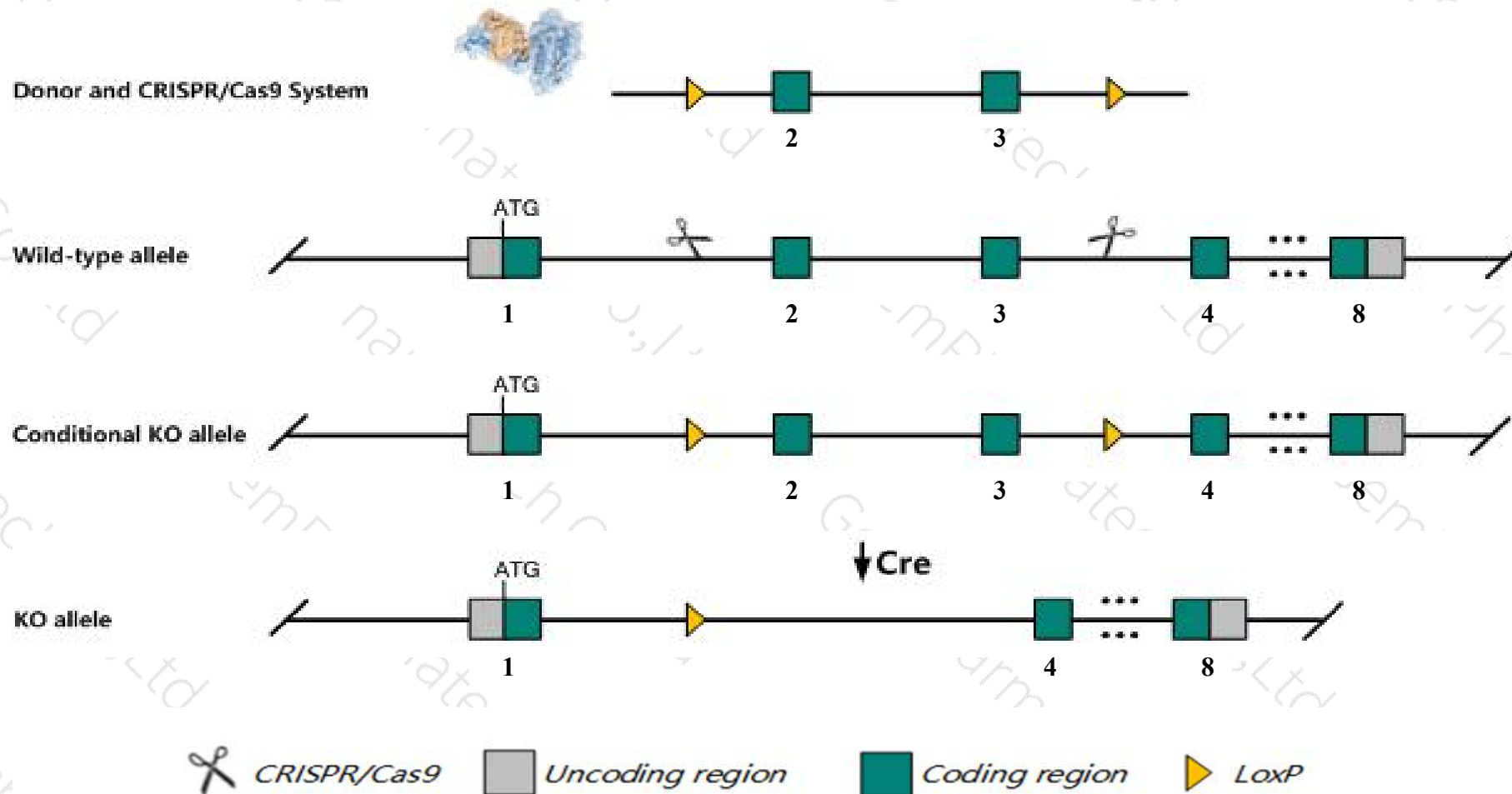
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Cd38* gene. The schematic diagram is as follows:



- The *Cd38* gene has 2 transcripts. According to the structure of *Cd38* gene, exon2-exon3 of *Cd38-201* (ENSMUST00000030964.5) transcript is recommended as the knockout region. The region contains 266bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Cd38* 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, homozygous mutation of this gene has resulted in an impaired antibody response to t cell dependent antigens and disrupted glucose-dependent insulin secretion.
- The *Cd38* gene is located on the Chr5. 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)

Cd38 CD38 antigen [Mus musculus (house mouse)]

Gene ID: 12494, updated on 13-Mar-2020

Summary



Official Symbol Cd38 provided by MGI

Official Full Name CD38 antigen provided by MGI

Primary source [MGI:MGI:107474](#)

See related [Ensembl:ENSMUSG00000029084](#)

Gene type protein coding

RefSeq status REVIEWED

Organism [Mus musculus](#)

Lineage Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus

Also known as ADPRC 1, Cd38-rs1, I-19

Summary This gene encodes a non-lineage-restricted, type II transmembrane glycoprotein that synthesizes and hydrolyzes cyclic adenosine 5'-diphosphate-ribose, an intracellular calcium ion mobilizing messenger. The release of soluble protein and the ability of membrane-bound protein to become internalized indicate both extracellular and intracellular functions for the protein. This protein has an N-terminal cytoplasmic tail, a single membrane-spanning domain, and a C-terminal extracellular region with four N-glycosylation sites. Knockout mice deficient for this gene display altered humoral immune responses. In addition, knockout mice exhibit higher locomotor activity and defects in nurturing and social behaviors. [provided by RefSeq, Sep 2015]

Expression Broad expression in large intestine adult (RPKM 24.5), colon adult (RPKM 16.5) and 21 other tissues [See more](#)

Orthologs [human](#) [all](#)

Transcript information (Ensembl)

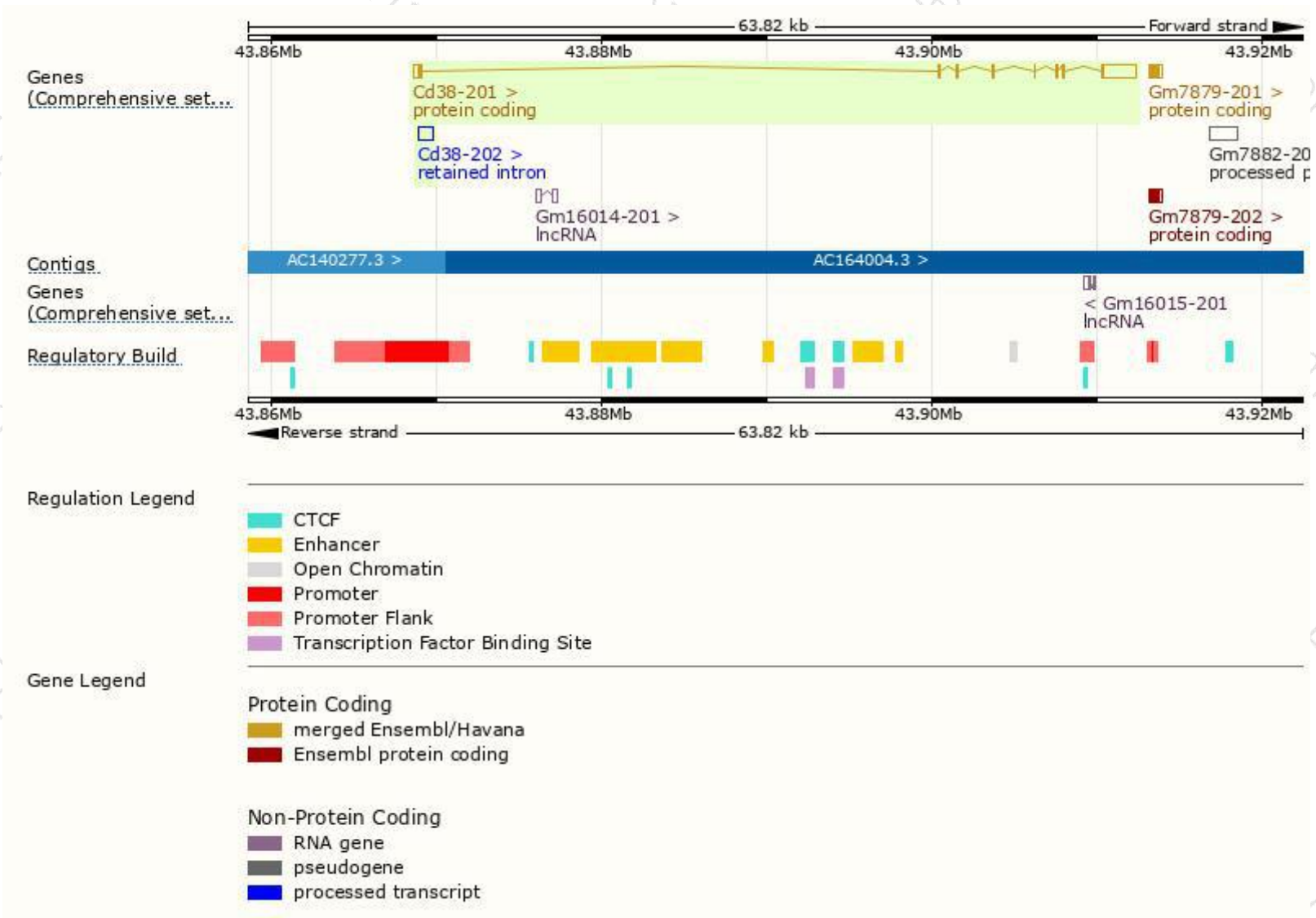
The gene has 2 transcripts, all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Cd38-201	ENSMUST00000030964.5	3270	304aa	Protein coding	CCDS19265	P56528 Q4FJL8	TSL:1 GENCODE basic APPRIS P1
Cd38-202	ENSMUST00000196600.1	881	No protein	Retained intron	-	-	TSL:NA

The strategy is based on the design of *Cd38-201* transcript, the transcription is shown below:



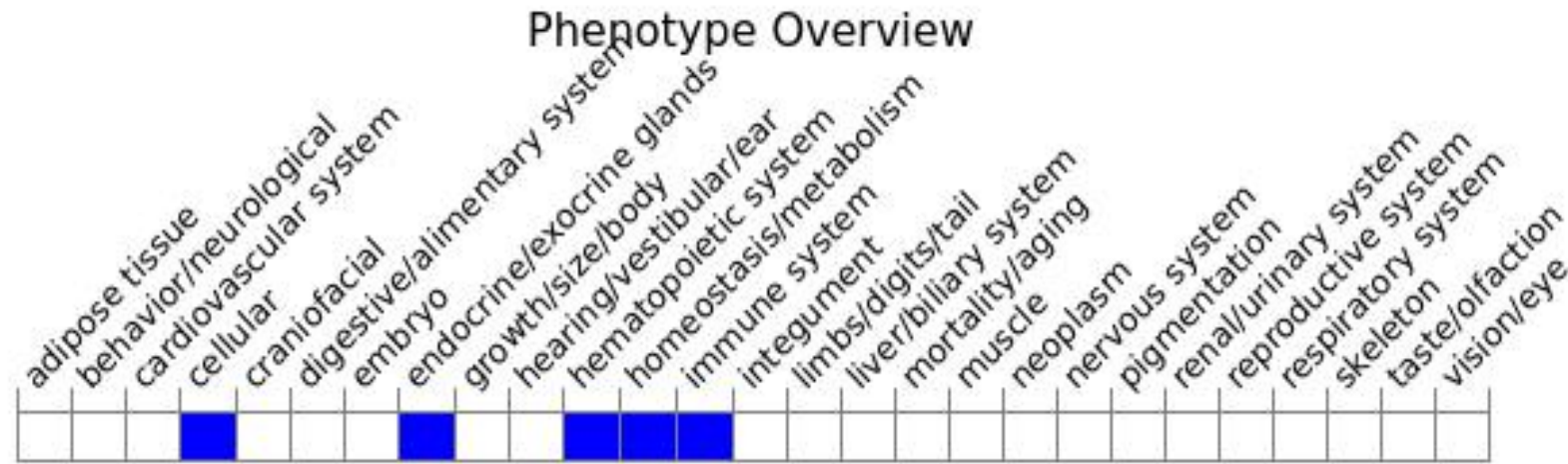
Genomic location distribution



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, homozygous mutation of this gene has resulted in an impaired antibody response to T cell dependent antigens and disrupted glucose-dependent insulin secretion.