

Aqp7 Cas9-CKO Strategy

Designer:

Huan Wang

Reviewer:

Huan Fan

Design Date:

2019-12-17

Project Overview

Project Name

Aqp7

Project type

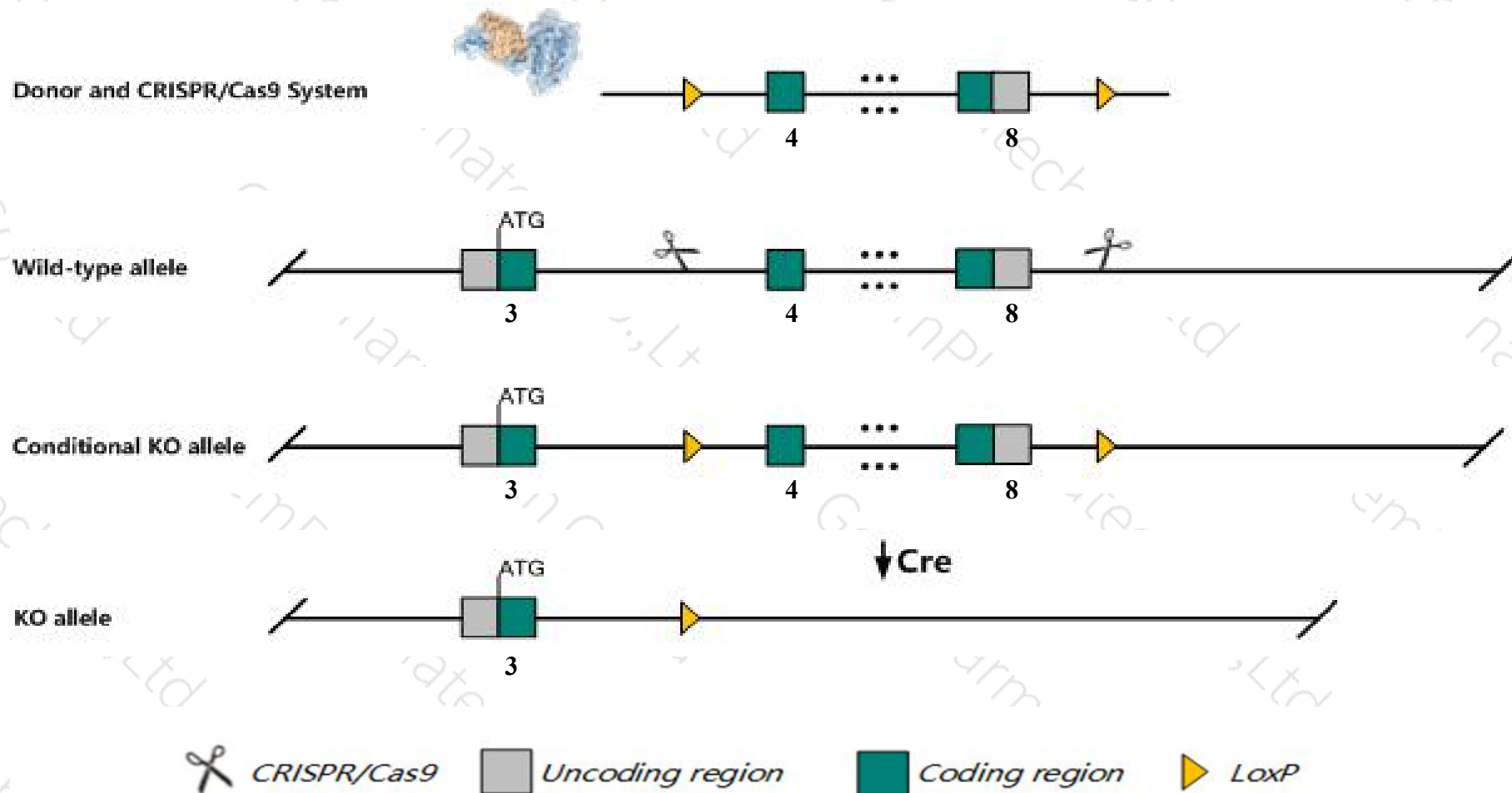
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Aqp7* gene. The schematic diagram is as follows:



- The *Aqp7* gene has 4 transcripts. According to the structure of *Aqp7* gene, exon4-exon8 of *Aqp7-201* (ENSMUST00000030136.12) transcript is recommended as the knockout region. The region contains most of the coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Aqp7* 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 null mice for one allele show decreased circulating glycerol levels and fasting hypoglycemia. Other mutant alleles show increased gonadal fat pad mass and adipocyte hypertrophy or increased urine glucose and impaired water permeability in the kidney, but have normal serum glycerol.
- The *Aqp7* gene is located on the Chr4. 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)

Aqp7 aquaporin 7 [Mus musculus (house mouse)]

Gene ID: 11832, updated on 2-Apr-2019

Summary



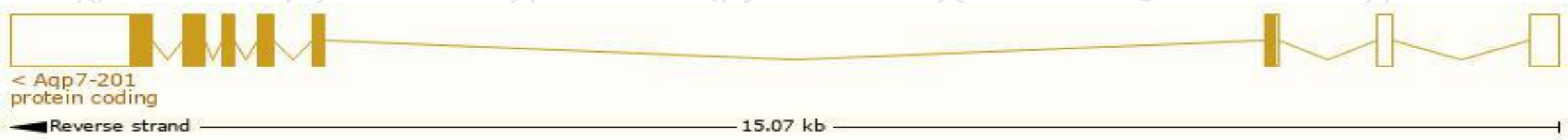
Official Symbol	Aqp7 provided by MGI
Official Full Name	aquaporin 7 provided by MGI
Primary source	MGI:MGI:1314647
See related	Ensembl:ENSMUSG00000028427
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	AQP7L, AQPap
Expression	Biased expression in testis adult (RPKM 55.7), subcutaneous fat pad adult (RPKM 41.1) and 7 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

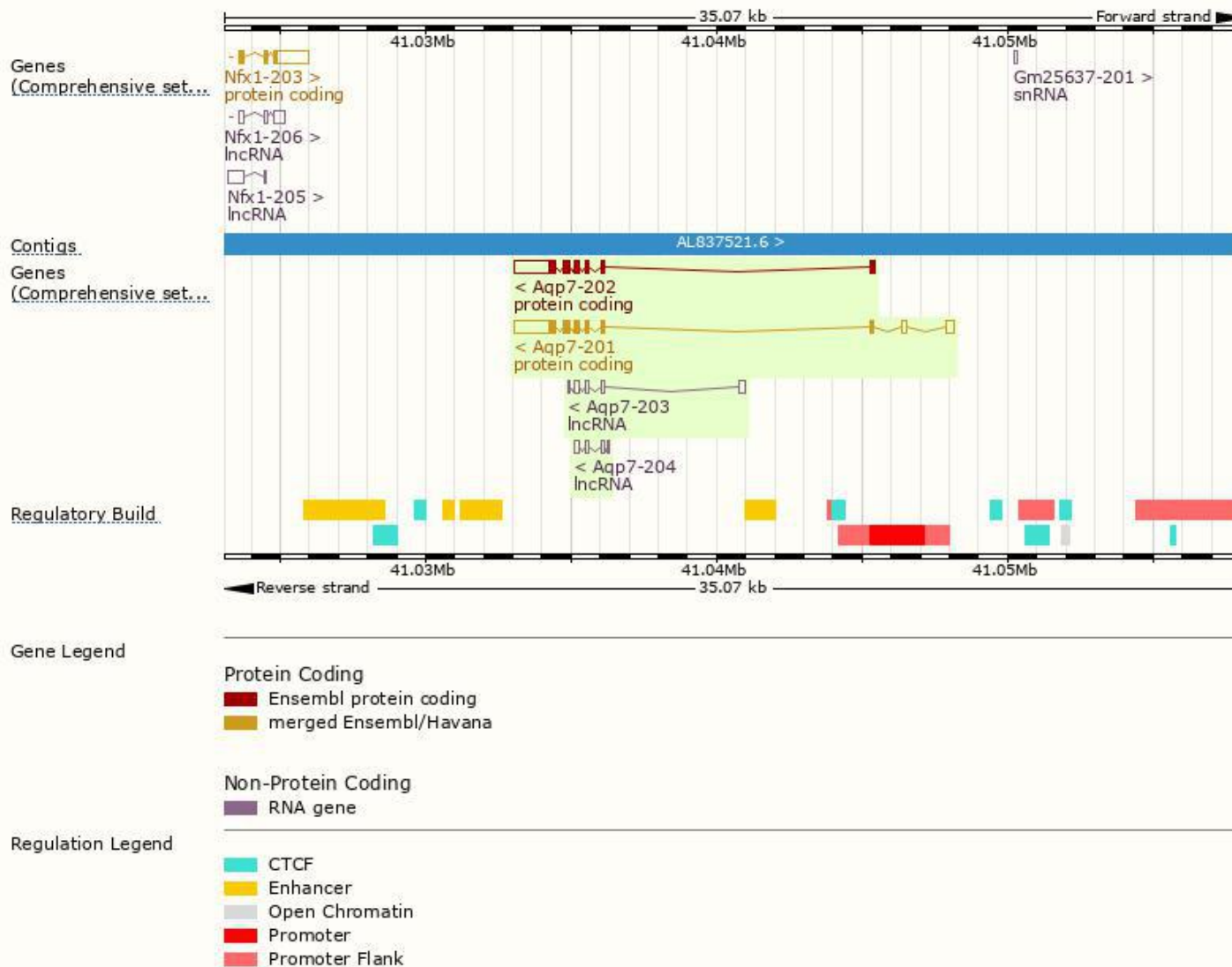
The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Aqp7-201	ENSMUST00000030136.12	2527	303aa	Protein coding	CCDS18055	Q54794 Q5DX24	TSL:1 GENCODE basic APPRIS P1
Aqp7-202	ENSMUST00000054945.7	2154	303aa	Protein coding	CCDS18055	Q54794 Q5DX24	TSL:1 GENCODE basic APPRIS P1
Aqp7-203	ENSMUST00000144201.7	665	No protein	lncRNA	-	-	TSL:3
Aqp7-204	ENSMUST00000149517.1	444	No protein	lncRNA	-	-	TSL:5

The strategy is based on the design of *Aqp7-201* transcript,The transcription is shown below



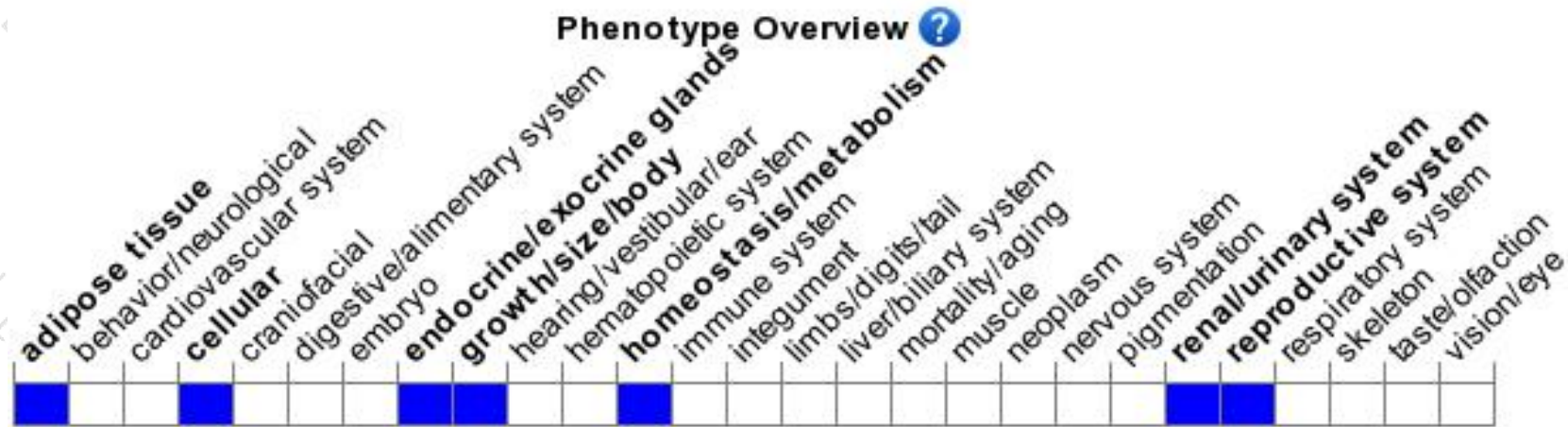
Genomic location distribution



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 null mice for one allele show decreased circulating glycerol levels and fasting hypoglycemia. Other mutant alleles show increased gonadal fat pad mass and adipocyte hypertrophy or increased urine glucose and impaired water permeability in the kidney, but have normal serum glycerol.

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

Tel: 400-9660890

