

Usp46 Cas9-CKO Strategy

Designer:

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Design Date:

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Project Overview

Project Name

Usp46

Project type

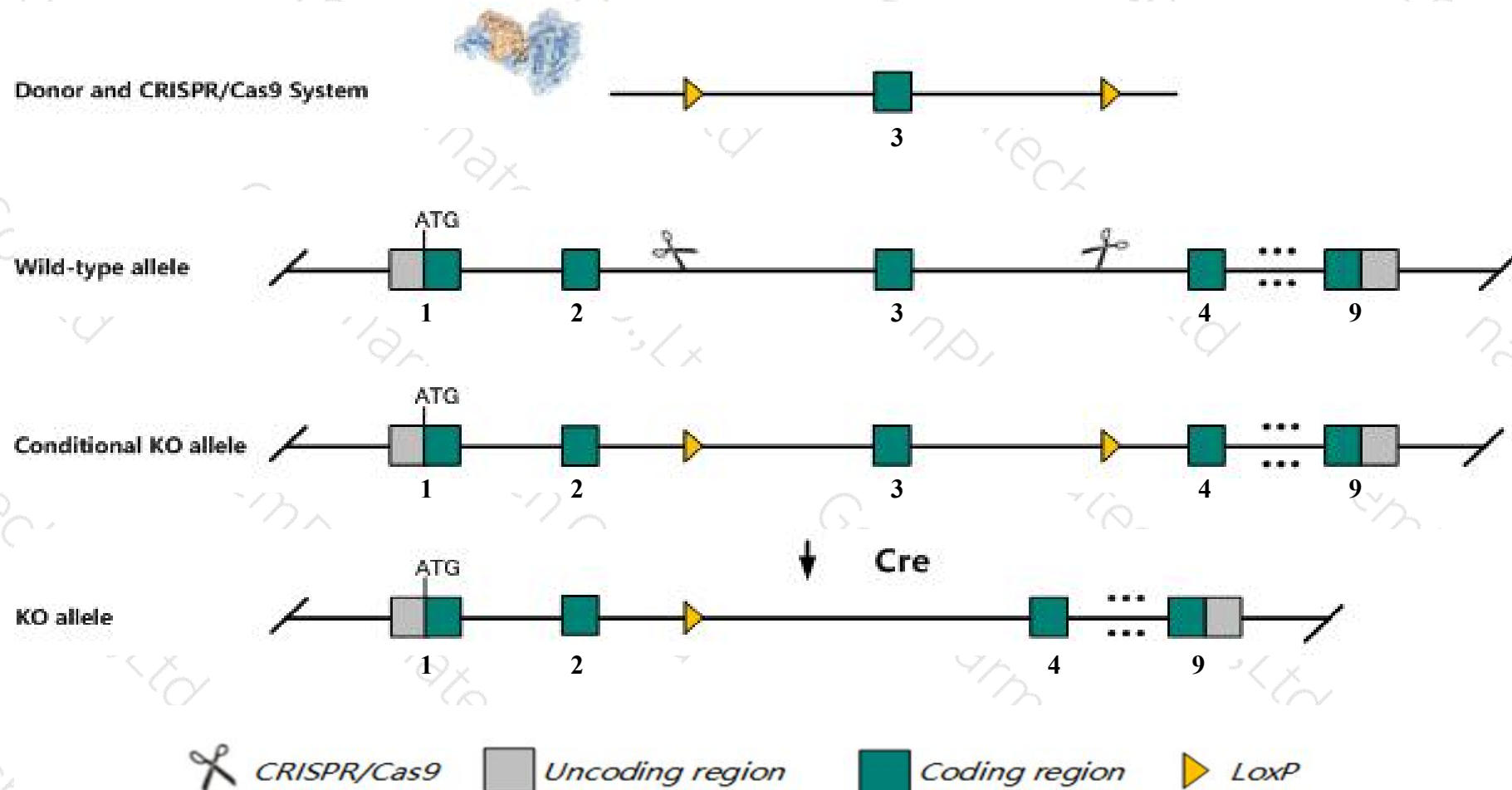
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Usp46* gene. The schematic diagram is as follows:



Technical routes

- The *Usp46* gene has 6 transcripts. According to the structure of *Usp46* gene, exon3 of *Usp46-201* (ENSMUST00000068058.13) transcript is recommended as the knockout region. The region contains 214bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Usp46* 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, Mice homozygous for a gene trap allele exhibit reduced depression-related behaviors.
- The KO region contains functional region of the *Usp46os2* gene. Knockout the region may affect the function of *Usp46os2* gene.
- Transcript *Usp46-206* may not be affected.
- The *Usp46* 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)

Usp46 ubiquitin specific peptidase 46 [Mus musculus (house mouse)]

Gene ID: 69727, updated on 19-Mar-2019

Summary



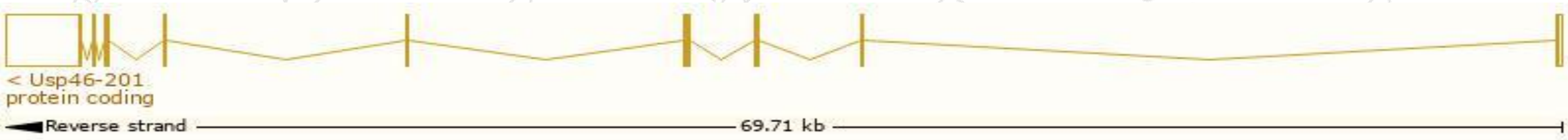
Official Symbol	Usp46 provided by MGI
Official Full Name	ubiquitin specific peptidase 46 provided by MGI
Primary source	MGI:MGI:1916977
See related	Ensembl:ENSMUSG00000054814
Gene type	protein coding
RefSeq status	PROVISIONAL
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	1190009E20Rik, 2410018I08Rik, AI451644
Expression	Broad expression in frontal lobe adult (RPKM 10.7), cerebellum adult (RPKM 9.1) and 22 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

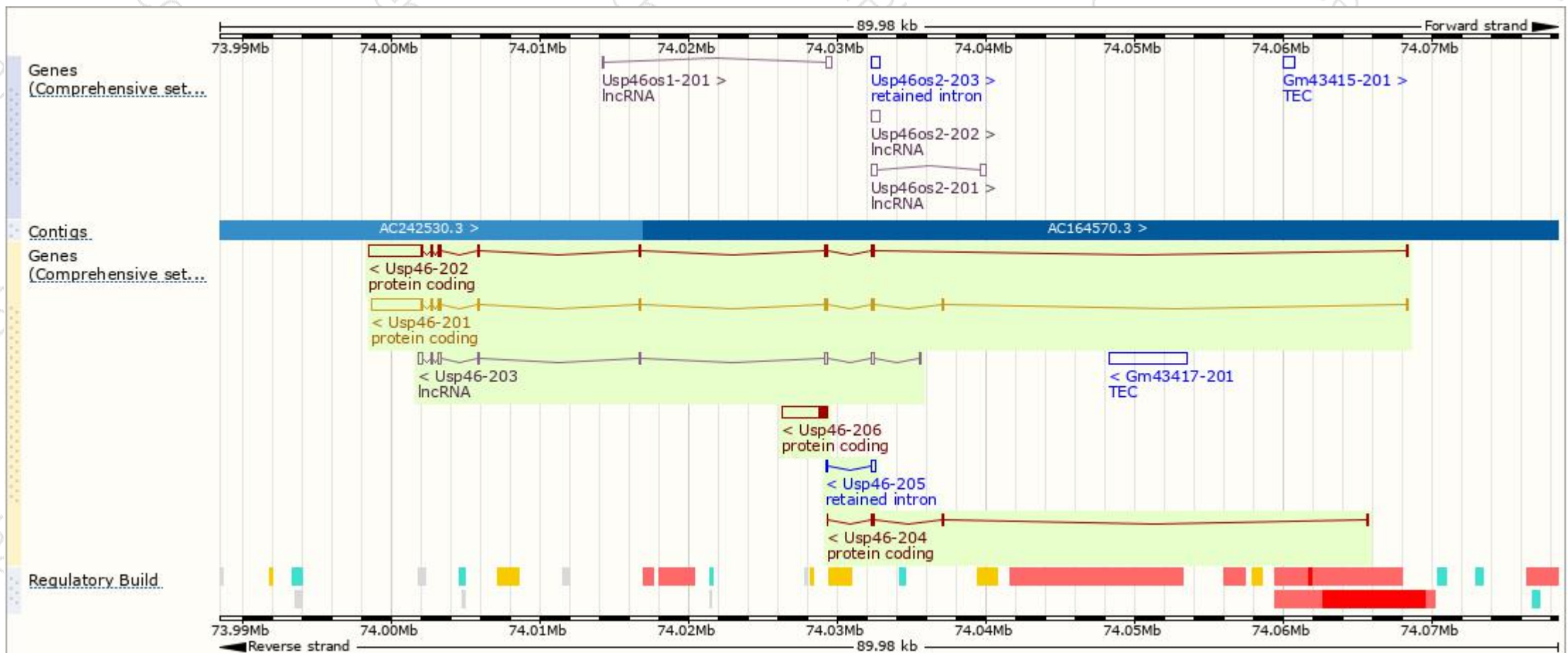
The gene has 6 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Usp46-201	ENSMUST00000068058.13	4557	366aa	Protein coding	CCDS39112	P62069	TSL:1 GENCODE basic APPRIS P1
Usp46-202	ENSMUST00000119154.7	4738	339aa	Protein coding	-	D3YVU0	TSL:5 GENCODE basic
Usp46-206	ENSMUST00000152408.2	2969	145aa	Protein coding	-	A0A0J9YUP8	CDS 5' incomplete TSL:3
Usp46-204	ENSMUST00000145016.2	452	121aa	Protein coding	-	D3YVJ5	CDS 3' incomplete TSL:3
Usp46-205	ENSMUST00000150009.1	389	No protein	Retained intron	-	-	TSL:2
Usp46-203	ENSMUST00000128750.1	1315	No protein	lncRNA	-	-	TSL:1

The strategy is based on the design of *Usp46-201* transcript,The transcription is shown below



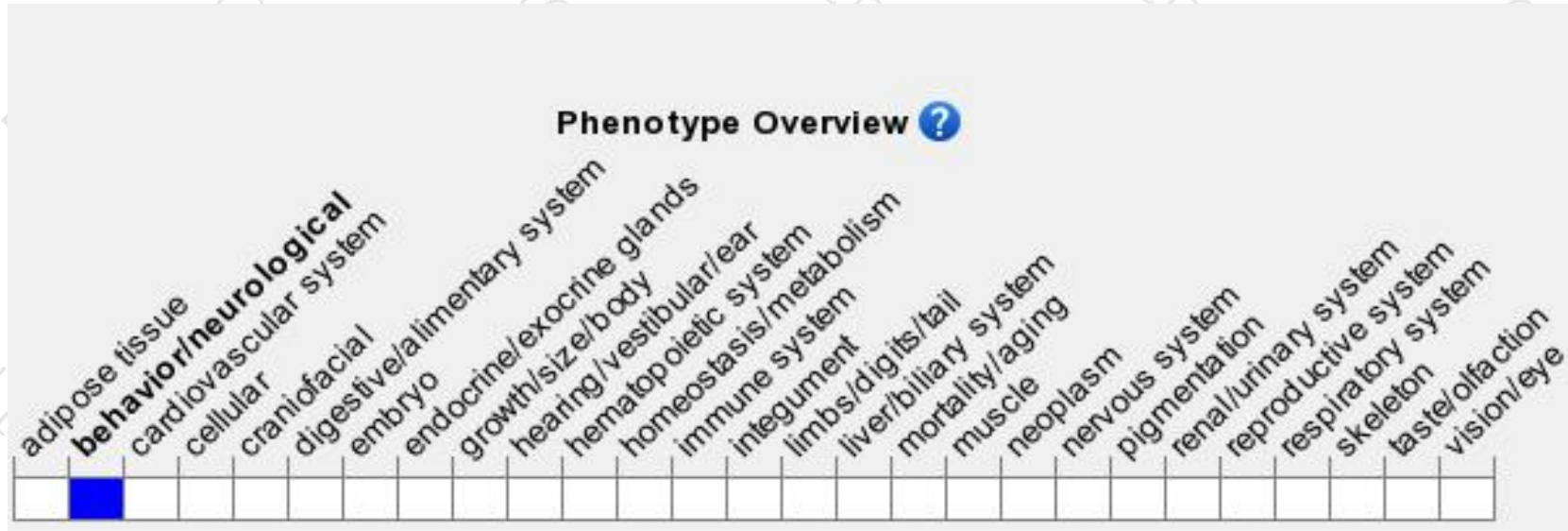
Genomic location distribution



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, Mice homozygous for a gene trap allele exhibit reduced depression-related behaviors.

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

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