

Usp7 Cas9-KO Strategy

Designer:

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Design Date:

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Project Overview

Project Name

Usp7

Project type

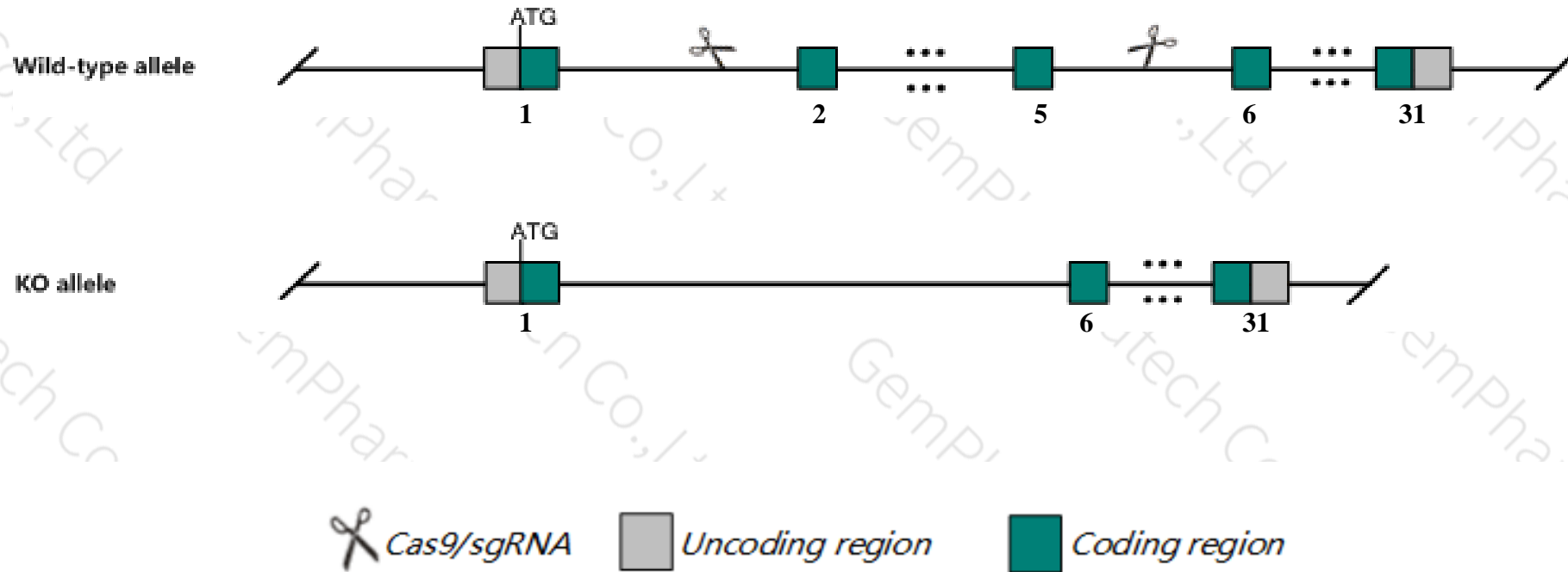
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Usp7* gene. The schematic diagram is as follows:



- The *Usp7* gene has 13 transcripts. According to the structure of *Usp7* gene, exon2-exon5 of *Usp7*-208 (ENSMUST00000161046.8) transcript is recommended as the knockout region. The region contains 532bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Usp7* gene. The brief process is as follows: sgRNA was transcribed in vitro. Cas9 and sgRNA 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.

- According to the existing MGI data, Mice homozygous for a null allele show embryonic growth arrest and die between E6.5 and E7.5. Mice homozygous for a conditional allele activated in neural cells exhibit complete neonatal lethality, absent gastric milk, uncoordinated movement and abnormal forebrain morphology.
- The *Usp7* gene is located on the Chr16. 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 the gene knockout on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

Gene information (NCBI)

Usp7 ubiquitin specific peptidase 7 [*Mus musculus* (house mouse)]

Gene ID: 252870, updated on 12-Aug-2019

Summary

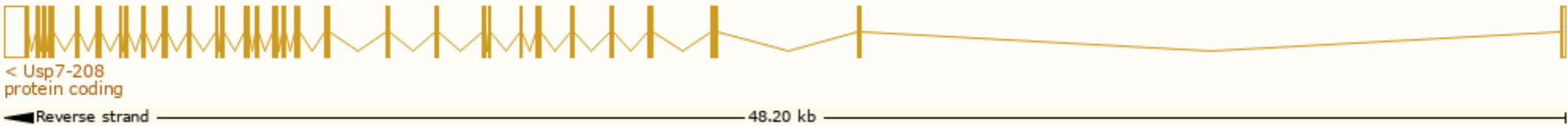
Official Symbol	Usp7 provided by MGI
Official Full Name	ubiquitin specific peptidase 7 provided by MGI
Primary source	MGI:MGI:2182061
See related	Ensembl:ENSMUSG00000022710
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Hausp; C80752; AA409944; AA617399; AU019296; AW548146; 2210010O09Rik
Expression	Ubiquitous expression in CNS E11.5 (RPKM 25.2), liver E14 (RPKM 24.8) and 28 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

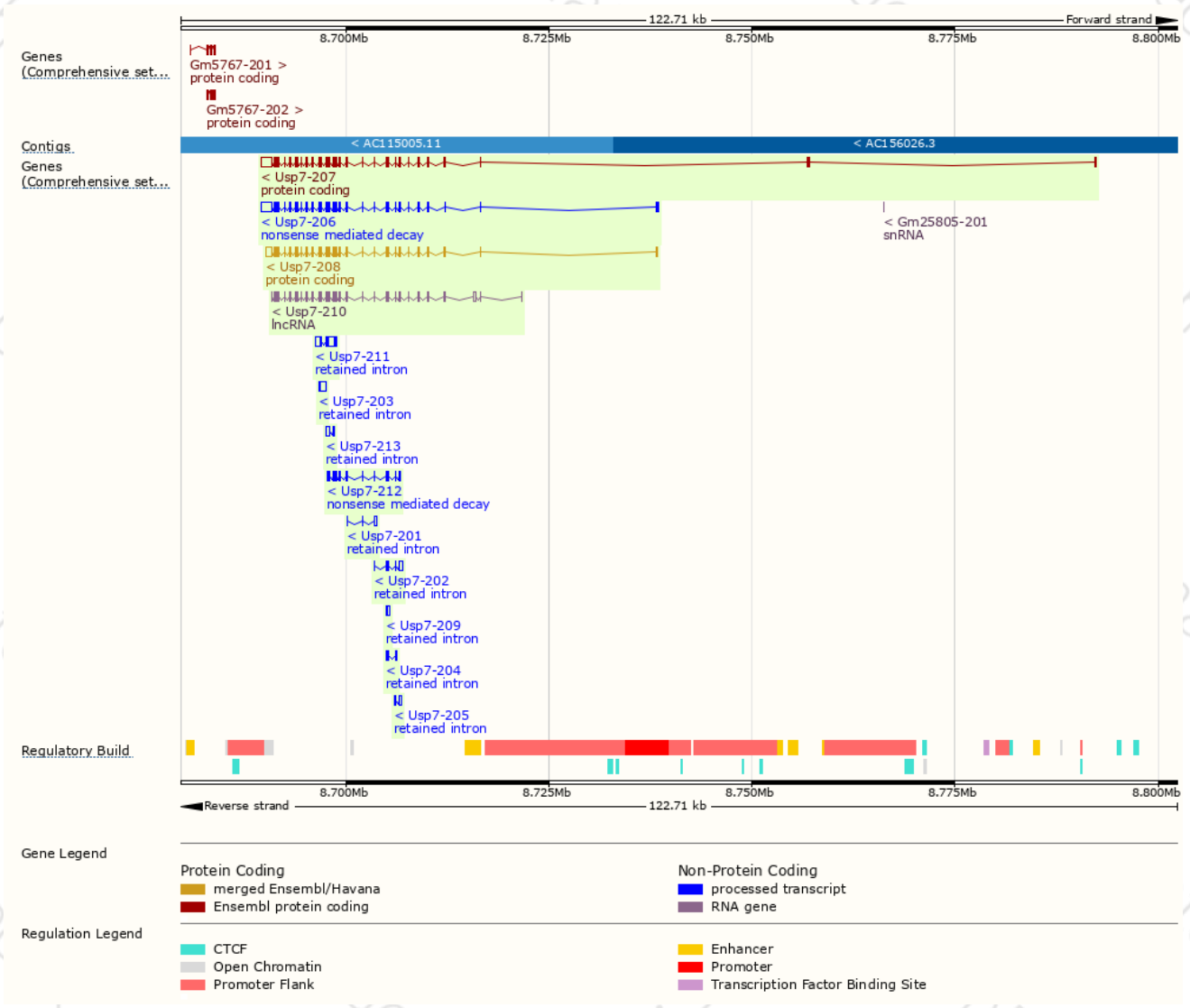
The gene has 13 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Usp7-208	ENSMUST00000161046.8	4003	1103aa	Protein coding	CCDS49755	F8VPX1	TSL:1 GENCODE basic APPRIS P2
Usp7-207	ENSMUST00000160405.7	4745	1143aa	Protein coding	-	E9PXY8	TSL:5 GENCODE basic APPRIS ALT2
Usp7-206	ENSMUST00000160326.7	4488	92aa	Nonsense mediated decay	-	E0CY04	TSL:1
Usp7-212	ENSMUST00000172505.1	1225	327aa	Nonsense mediated decay	-	G3UWR8	CDS 5' incomplete TSL:5
Usp7-211	ENSMUST00000162929.1	1572	No protein	Retained intron	-	-	TSL:1
Usp7-203	ENSMUST00000159387.1	823	No protein	Retained intron	-	-	TSL:3
Usp7-202	ENSMUST00000159287.7	637	No protein	Retained intron	-	-	TSL:3
Usp7-213	ENSMUST00000173939.1	600	No protein	Retained intron	-	-	TSL:3
Usp7-201	ENSMUST00000159281.1	474	No protein	Retained intron	-	-	TSL:3
Usp7-205	ENSMUST00000159509.1	411	No protein	Retained intron	-	-	TSL:3
Usp7-204	ENSMUST00000159503.1	280	No protein	Retained intron	-	-	TSL:5
Usp7-209	ENSMUST00000162141.1	280	No protein	Retained intron	-	-	TSL:3
Usp7-210	ENSMUST00000162445.8	3447	No protein	lncRNA	-	-	TSL:5

The strategy is based on the design of *Usp7-208* transcript,The transcription is shown below



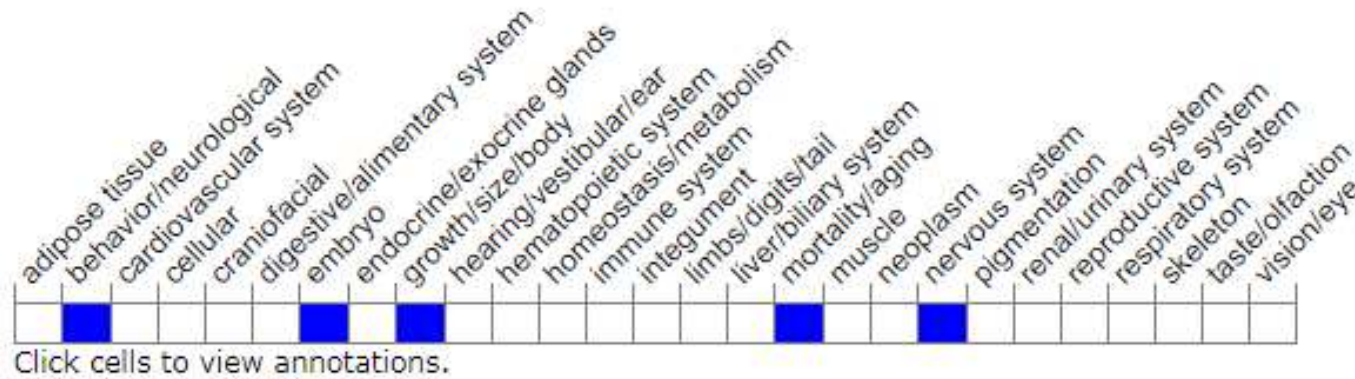
Genomic location distribution



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 null allele show embryonic growth arrest and die between E6.5 and E7.5. Mice homozygous for a conditional allele activated in neural cells exhibit complete neonatal lethality, absent gastric milk, uncoordinated movement and abnormal forebrain morphology.

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

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