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Osbpl1a Cas9-KO Strategy

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Design Date: 2022-8-23

Overview

Target Gene Name

- Osbpl1a

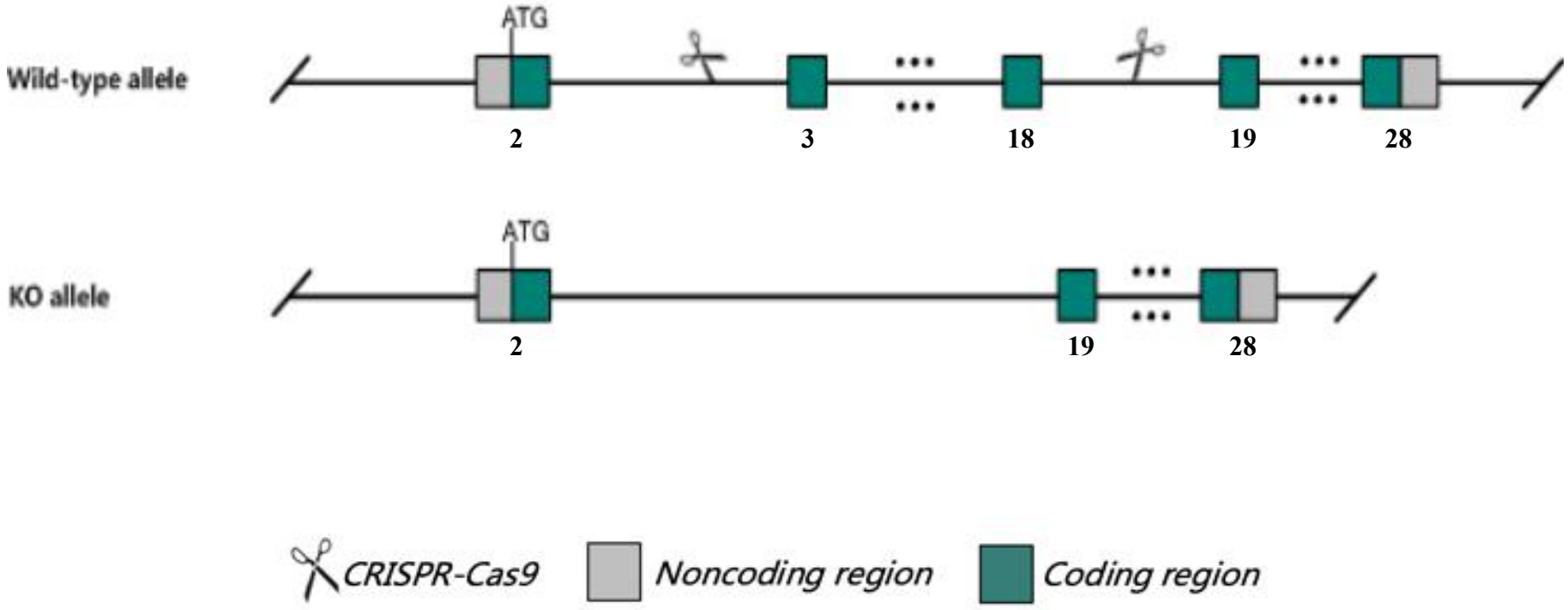
Project Type

- Cas9-KO

Genetic Background

- C57BL/6JGpt

Strain Strategy



Schematic representation of CRISPR-Cas9 engineering used to edit the *Osbpl1a* gene.

Technical Information

- The *Osbpl1a* gene has 24 transcripts. According to the structure of *Osbpl1a* gene, exon3-exon18 of *Osbpl1a*-201 (ENSMUST00000074352.11) transcript is recommended as the knockout region. The region contains 1556bp of coding sequences. Knocking out the region will result in disruption of protein function.
- In this project we use CRISPR-Cas9 technology to modify *Osbpl1a* gene. The brief process is as follows: gRNAs were transcribed in vitro. Cas9 and gRNAs 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 on-target amplicon sequencing. A stable F1-generation mouse strain was obtained by mating positive F0-generation mice with C57BL/6JGpt mice and confirmation of the desired mutant allele was carried out by PCR and on-target amplicon sequencing.

Gene Information

Osbpl1a oxysterol binding protein-like 1A [Mus musculus (house mouse)]

Gene ID: 64291, updated on 24-Apr-2022

Summary

Official Symbol	Osbpl1a provided by MGI
Official Full Name	oxysterol binding protein-like 1A provided byMGI
Primary source	MGI:MGI:1927551
See related	Ensembl:ENSMUSG00000044252
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	G430090F17Rik, Gm753, ORP-1, Osbpl1b
Expression	Broad expression in cortex adult (RPKM 23.6), frontal lobe adult (RPKM 14.8) and 21 other tissuesSee more
Orthologs	human all

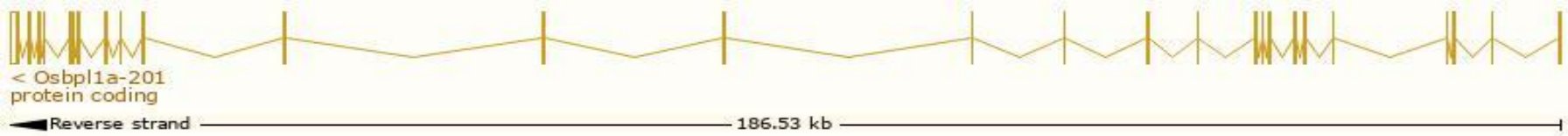
Source: https://www.ncbi.nlm.nih.gov/

Transcript Information

The gene has 24 transcripts, all transcripts are shown below:

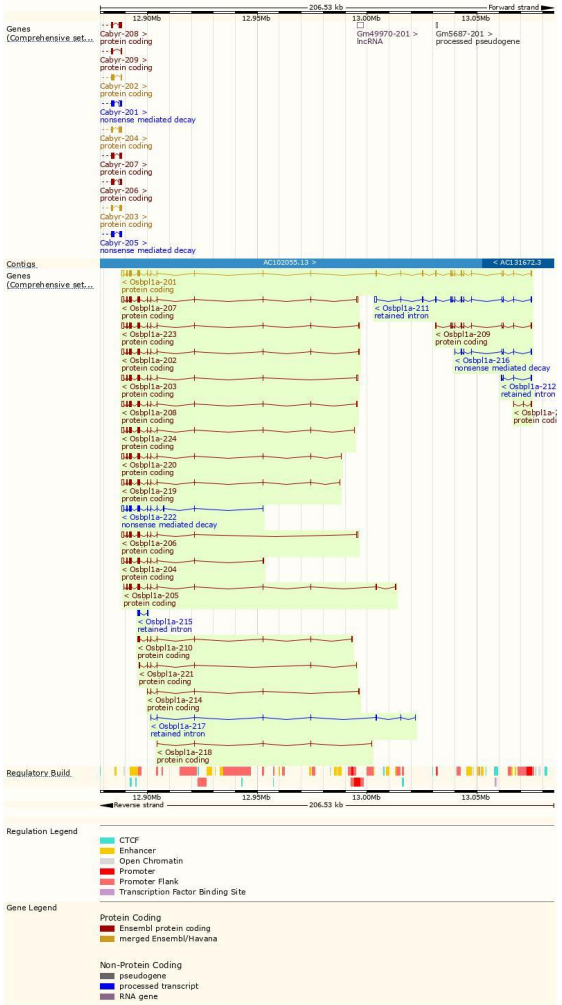
Transcript ID	Name	bp	Protein	Biotype	CCDS	UniProt Match	Flags
ENSMUST00000074352.11	Osbpl1a-201	3956	950aa	Protein coding	CCDS29067	Q91XL9-1	Ensembl Canonical GENCODE basic APPRIS P1 TSL:1
ENSMUST00000121808.8	Osbpl1a-207	3030	437aa	Protein coding	CCDS57114	Q91XL9-2	GENCODE basic TSL:1
ENSMUST00000121774.8	Osbpl1a-206	2931	410aa	Protein coding		Q91XL9-3	GENCODE basic TSL:1
ENSMUST00000118313.8	Osbpl1a-203	2893	437aa	Protein coding	CCDS57114	Q91XL9-2	GENCODE basic TSL:1
ENSMUST00000234871.2	Osbpl1a-223	2818	437aa	Protein coding	CCDS57114	Q91XL9-2	GENCODE basic
ENSMUST00000117361.8	Osbpl1a-202	2687	437aa	Protein coding	CCDS57114	Q91XL9-2	GENCODE basic TSL:1
ENSMUST00000121888.8	Osbpl1a-208	2674	437aa	Protein coding	CCDS57114	Q91XL9-2	GENCODE basic TSL:1
ENSMUST00000235027.2	Osbpl1a-224	2531	547aa	Protein coding		A0A3Q4EI24	GENCODE basic
ENSMUST00000119043.8	Osbpl1a-204	2522	437aa	Protein coding	CCDS57114	Q91XL9-2	GENCODE basic TSL:1
ENSMUST00000234118.2	Osbpl1a-219	2494	528aa	Protein coding		A0A3Q4EG54	GENCODE basic
ENSMUST00000234194.2	Osbpl1a-220	2489	437aa	Protein coding	CCDS57114	Q91XL9-2	GENCODE basic
ENSMUST00000119512.8	Osbpl1a-205	1947	558aa	Protein coding	CCDS57115	Q3V156	GENCODE basic TSL:1
ENSMUST00000124570.3	Osbpl1a-210	1368	281aa	Protein coding		D3Z754	TSL:2 CDS 3' incomplete
ENSMUST00000122175.8	Osbpl1a-209	1203	338aa	Protein coding		Q8K2D2	GENCODE basic TSL:1
ENSMUST00000234427.2	Osbpl1a-221	917	200aa	Protein coding		A0A3Q4L2S6	CDS 3' incomplete
ENSMUST00000143077.8	Osbpl1a-214	798	184aa	Protein coding		D3Z7I9	TSL:3 CDS 3' incomplete
ENSMUST00000155650.3	Osbpl1a-218	602	187aa	Protein coding		D3YZ66	TSL:5 CDS 3' incomplete
ENSMUST00000142467.2	Osbpl1a-213	363	37aa	Protein coding		A0A3Q4L372	TSL:3 CDS 3' incomplete
ENSMUST00000234428.2	Osbpl1a-222	2317	51aa	Nonsense mediated decay		A0A3Q4EG41	-
ENSMUST00000147197.2	Osbpl1a-216	803	66aa	Nonsense mediated decay		D6RDE4	TSL:5
ENSMUST00000132594.8	Osbpl1a-211	2353	No protein	Retained intron		-	TSL:5
ENSMUST00000154614.8	Osbpl1a-217	936	No protein	Retained intron		-	TSL:1
ENSMUST00000141651.2	Osbpl1a-212	681	No protein	Retained intron		-	TSL:2
ENSMUST00000145777.2	Osbpl1a-215	669	No protein	Retained intron		-	TSL:2

The strategy is based on the design of Osbpl1a-201 transcript, the transcription is shown below:



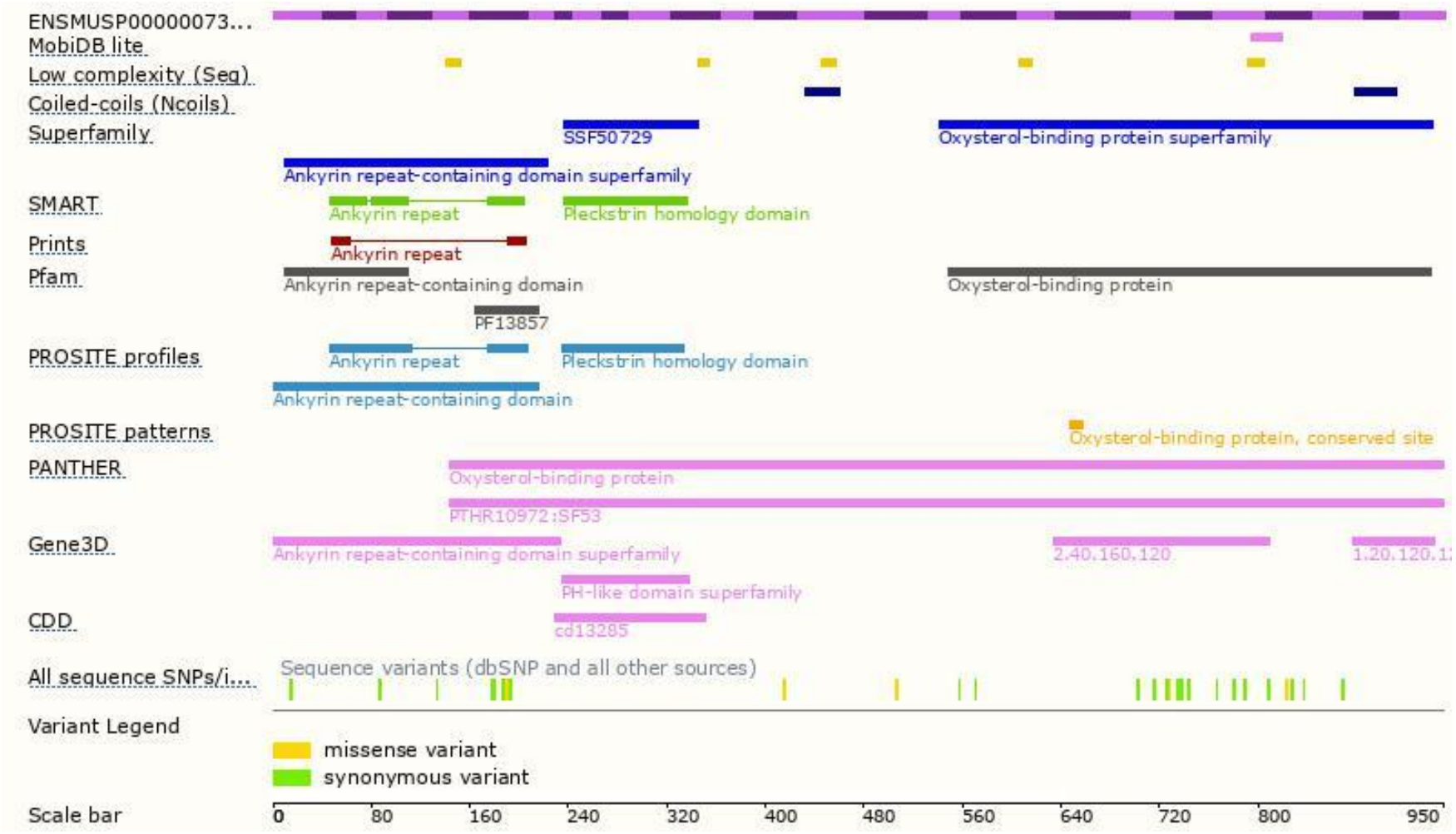
Source: https://www.ensembl.org

Genomic Information



Source: : https://www.ensembl.org

Protein Information



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Source: : https://www.ensembl.org

Important Information

- *Osbpl1a* is located on Chr18. If the knockout mice are crossed with other mouse strains to obtain double homozygous mutant offspring, please avoid the situation that the second gene is on the same chromosome.
- This Strategy is designed based on genetic information in existing databases. Due to the complexity of biological processes, all risks of the mutation on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.