

S1pr1 Cas9-KO Strategy

Designer:

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Project Overview



Project Name

S1pr1

Project type

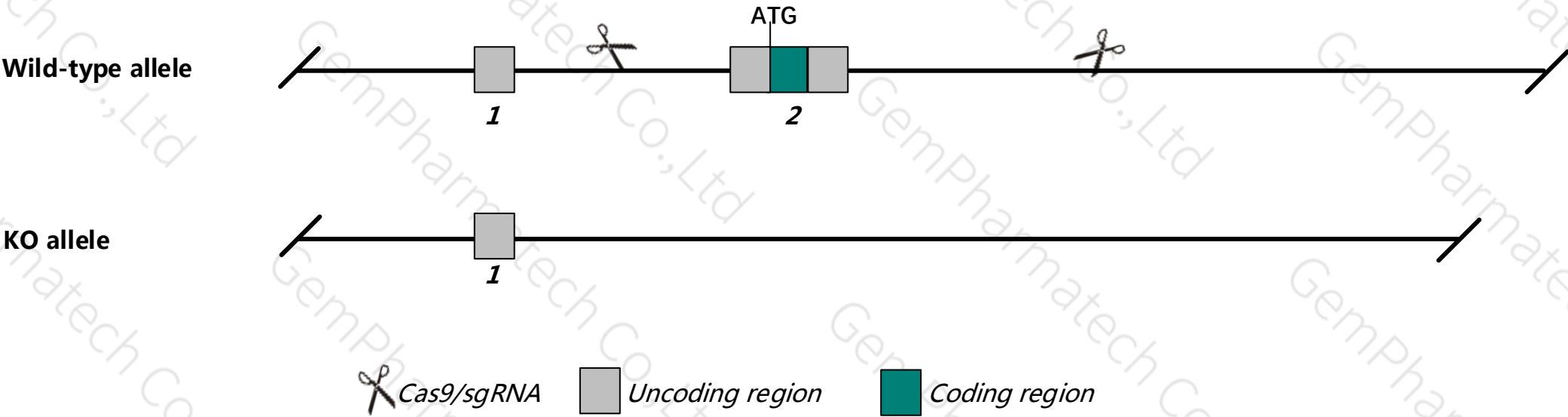
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Slpr1* gene. The schematic diagram is as follows:



Technical routes

- The *Slpr1* gene has 1 transcript. According to the structure of *Slpr1* gene, exon2 of *Slpr1*-201 (ENSMUST00000055676.3) transcript is recommended as the knockout region. The region contains all 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 *Slpr1* gene. The brief process is as follows: sgRNA was transcribed in vitro. Cas9, 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 , Homozygotes for targeted mutations exhibit vascular defects resulting in embryonic hemorrhaging and lethality by embryonic day 14.5.
- The KO region contains functional region of the *Gm9889* gene. Knockout the region may affect the function of *Gm9889* gene.
- The *Slpr1* gene is located on the Chr3. 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 knockout on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

Gene information (NCBI)

S1pr1 sphingosine-1-phosphate receptor 1 [*Mus musculus* (house mouse)]

Gene ID: 13609, updated on 3-Sep-2019

Summary

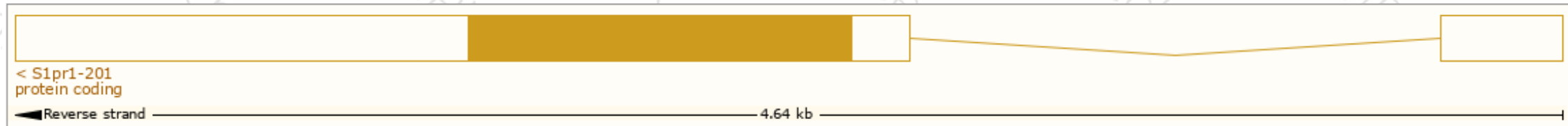
| | |
|---------------------------|--|
| Official Symbol | S1pr1 provided by MGI |
| Official Full Name | sphingosine-1-phosphate receptor 1 provided by MGI |
| Primary source | MGI:MGI:1096355 |
| See related | Ensembl:ENSMUSG00000045092 |
| Gene type | protein coding |
| RefSeq status | REVIEWED |
| Organism | Mus musculus |
| Lineage | Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus |
| Also known as | S1p; Edg1; Lpb1; S1p1; AI849002 |
| Summary | This gene encodes a G-protein-coupled receptor bound by the lysophospholipid, sphingosine 1-phosphate. The gene product functions in endothelial cells and is involved in vascular and heart development. This receptor is highly expressed in T and B lymphocytes, and it plays a role in T cell and B cell export from peripheral lymphoid organs. This protein is bound and downregulated by FTY720, an exogenous immunosuppressant drug studied in mouse disease models for multiple sclerosis in humans. [provided by RefSeq, Jan 2010] |
| Expression | Broad expression in lung adult (RPKM 117.9), spleen adult (RPKM 77.3) and 21 other tissues See more |
| Orthologs | human all |

Transcript information (Ensembl)

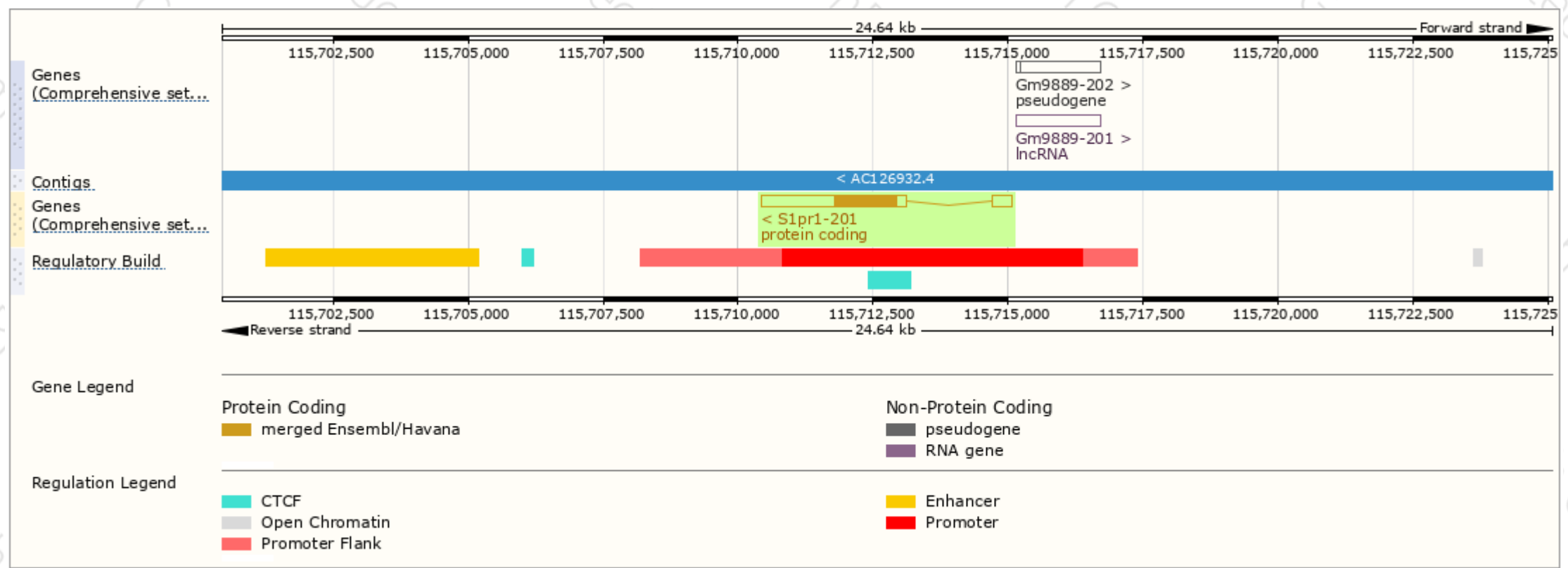
The gene has 1 transcripts, and the transcript is shown below:

| Name | Transcript ID | bp | Protein | Biotype | CCDS | UniProt | Flags |
|-----------|--------------------------------------|------|-----------------------|----------------|---------------------------|------------------------|-------------------------------|
| S1pr1-201 | ENSMUST00000055676.3 | 3046 | 382aa | Protein coding | CCDS17781 | O08530 | TSL:1 Gencode basic APPRIS P1 |

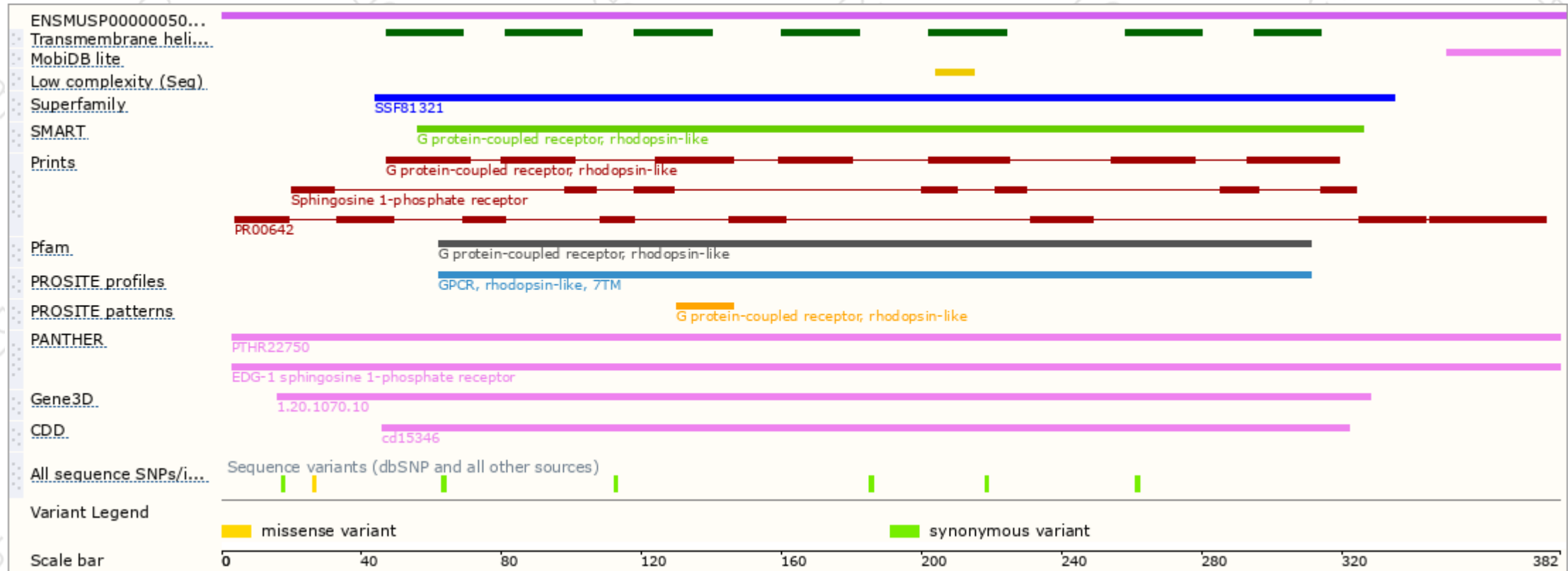
The strategy is based on the design of *S1pr1-201* transcript, The transcription is shown below



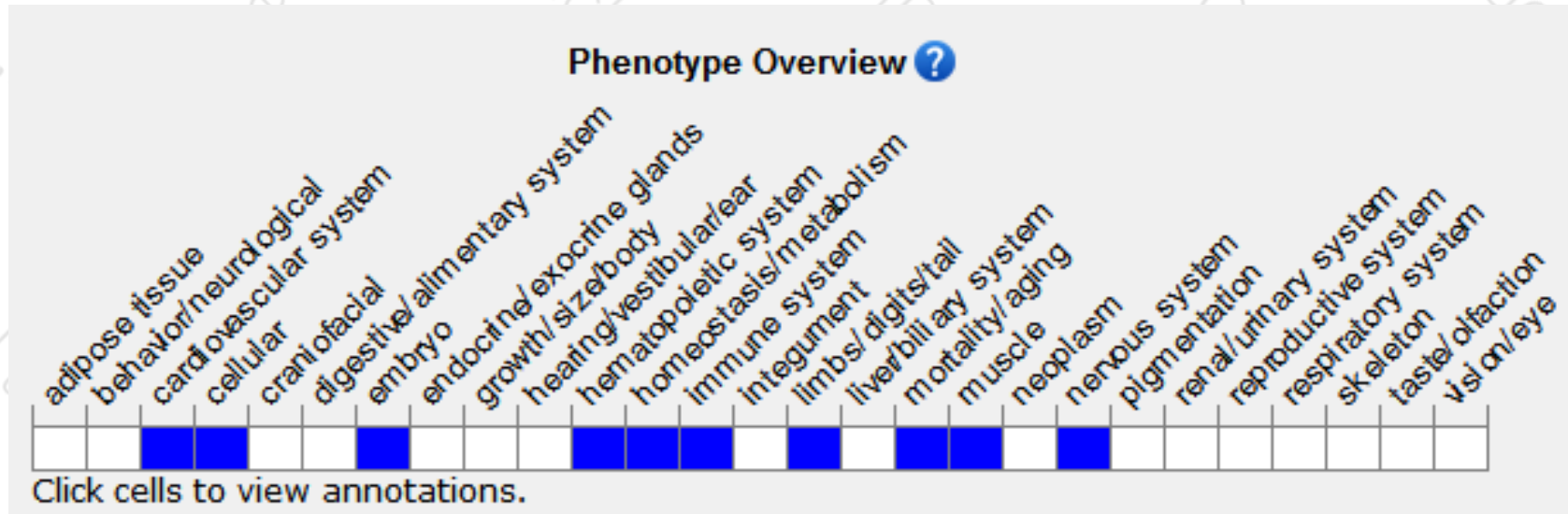
Genomic location distribution



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, Homozygotes for targeted mutations exhibit vascular defects resulting in embryonic hemorrhaging and lethality by embryonic day 14.5.

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