# *Sos1* Cas9-KO Strategy

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Design Date:2019-8-27

# Project Overview

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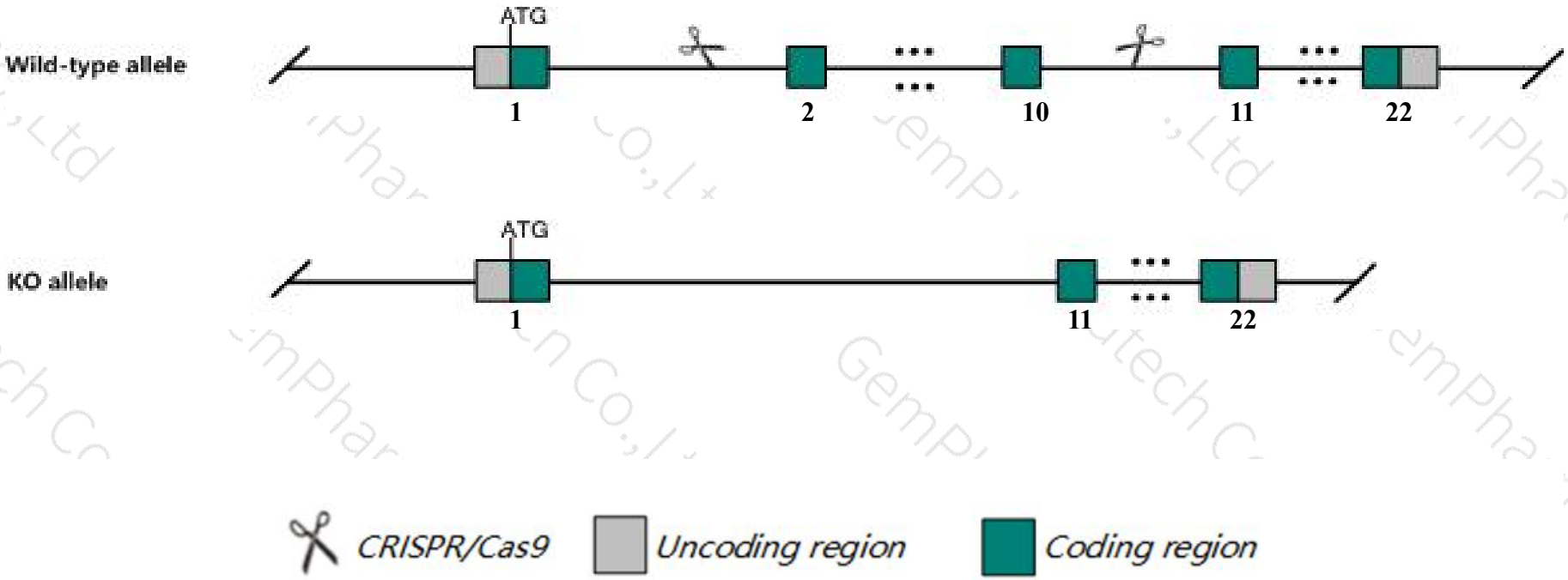
|---|---|
| **Project Name** | ***Sos1*** |
| **Project type** | **Cas9-KO** |
| **Strain background** | **C57BL/6JGpt** |

# Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Sos1* gene. The schematic diagram is as follows:



# Technical routes

➢ The *Sos1* gene has 2 transcripts. According to the structure of *Sos1* gene, exon2-exon10 of *Sos1-201* (ENSMUST00000068714.6) transcript is recommended as the knockout region.The region contains 1771bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Sos1* gene. The brief process is as follows: gRNA was transcribed in vitro.Cas9 and gRNA 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.

# Notice

- According to the existing MGI data,Homozygous null mutant embryos exhibit placental and cardiovascular defects resulting in death around mid-gestation. When heterozygous, these mutations enhance the eye defects of homozygous mutants of the epidermal growth factor receptor gene.

- The *Sos1* gene is located on the Chr17. 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）

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## Sos1 SOS Ras/Rac guanine nucleotide exchange factor 1 [ *Mus musculus* (house mouse) ]

Gene ID: 20662, updated on 21-Aug-2019

### Summary

| | |
|---|---|
| **Official Symbol** | Sos1 provided by MGI |
| **Official Full Name** | SOS Ras/Rac guanine nucleotide exchange factor 1 provided by MGI |
| **Primary source** | MGI:MGI:98354 |
| **See related** | Ensembl:ENSMUSG00000024241 |
| **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** | AI449023; 9630010N06; 4430401P03Rik |
| **Expression** | Ubiquitous expression in CNS E18 (RPKM 5.3), cerebellum adult (RPKM 5.1) and 28 other tissues See more |
| **Orthologs** | human all |

### Genomic context

**Location:** 17 E3; 17 50.67 cM

See Sos1 in Genome Data Viewer

**Exon count:** 22

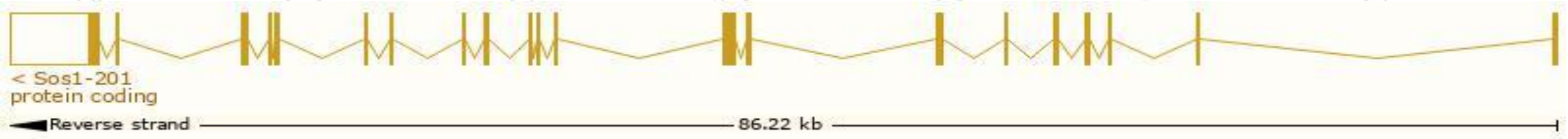
| Annotation release | Status | Assembly | Chr | Location |
|---|---|---|---|---|
| 108 | current | GRCm38.p6 (GCF_000001635.26) | 17 | NC_000083.6 (80393752..80480453, complement) |
| Build 37.2 | previous assembly | MGSCv37 (GCF_000001635.18) | 17 | NC_000083.5 (80793092..80879793, complement) |

# Transcript information（Ensembl）

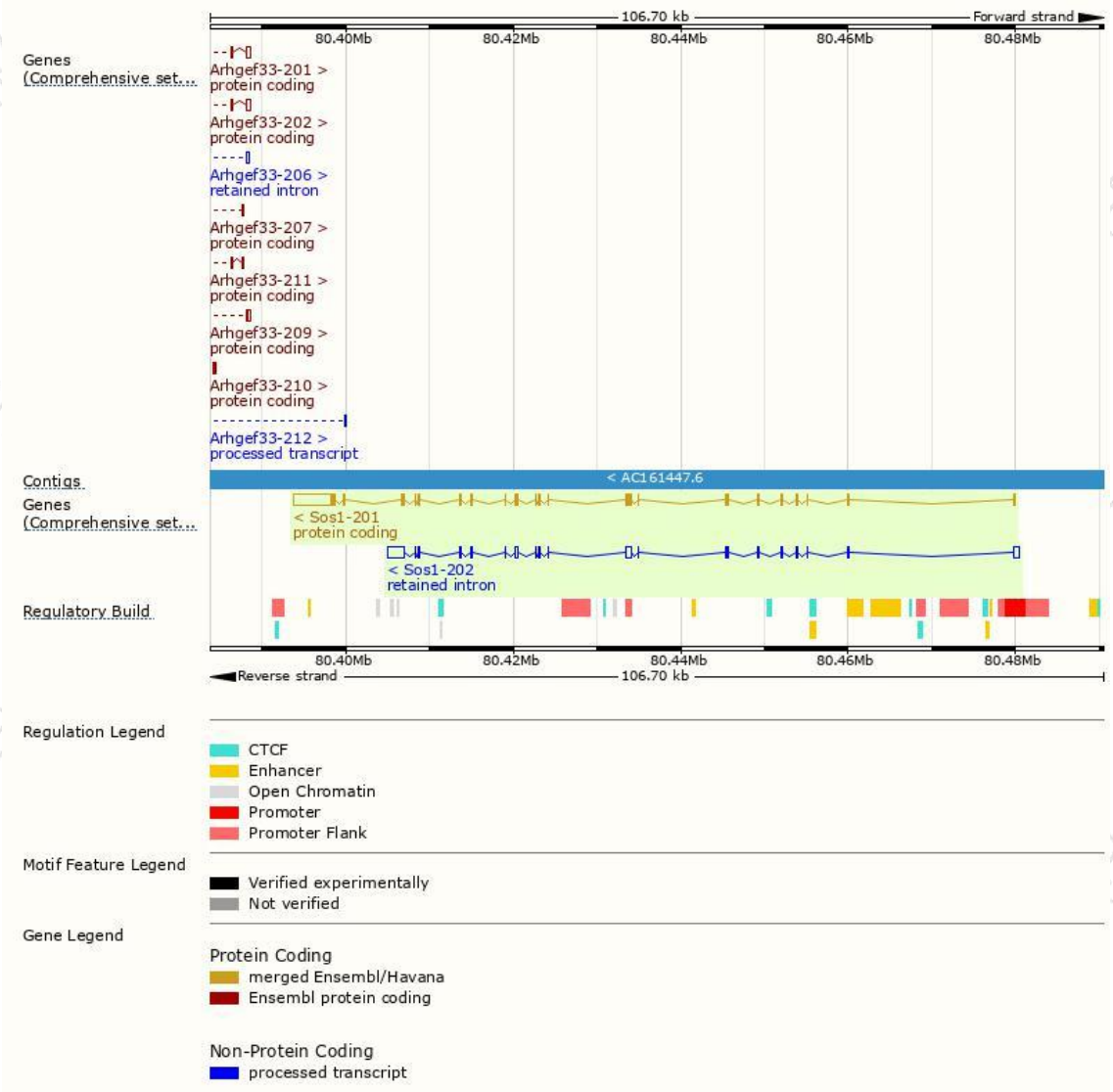
The gene has 2 transcripts,all transcripts are shown below:

| Name | Transcript ID | bp | Protein | Biotype | CCDS | UniProt | Flags |
|---|---|---|---|---|---|---|---|
| Sos1-201 | ENSMUST00000068714.6 | 8436 | 1319aa | Protein coding | CCDS37704 | Q62245 | TSL:2 GENCODE basic APPRIS P1 |
| Sos1-202 | ENSMUST00000234841.1 | 5553 | No protein | Retained intron | - | - | |

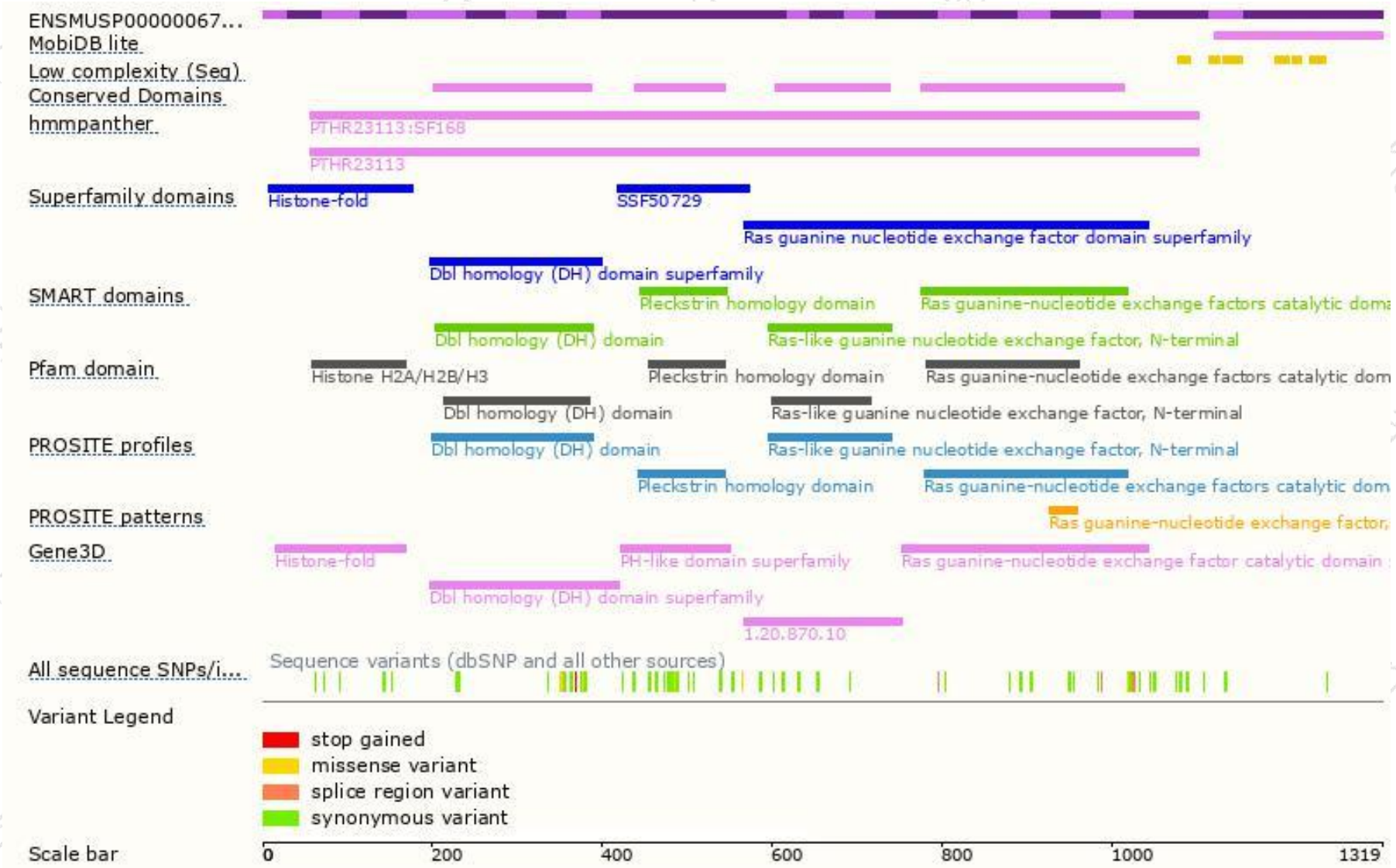
The strategy is based on the design of *Sos1-201* transcript,The transcription is shown below



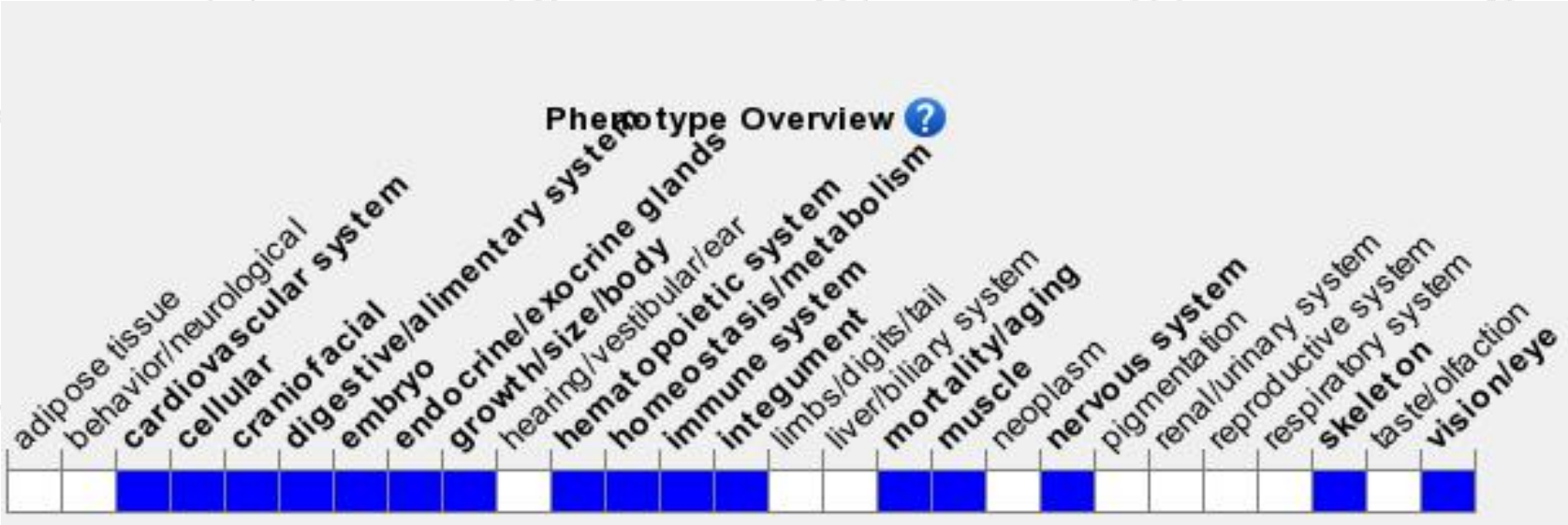
# Genomic location distribution



# 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/).*

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

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