

# Sema3e Cas9-KO Strategy

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# Overview

## Target Gene Name

- Sema3e

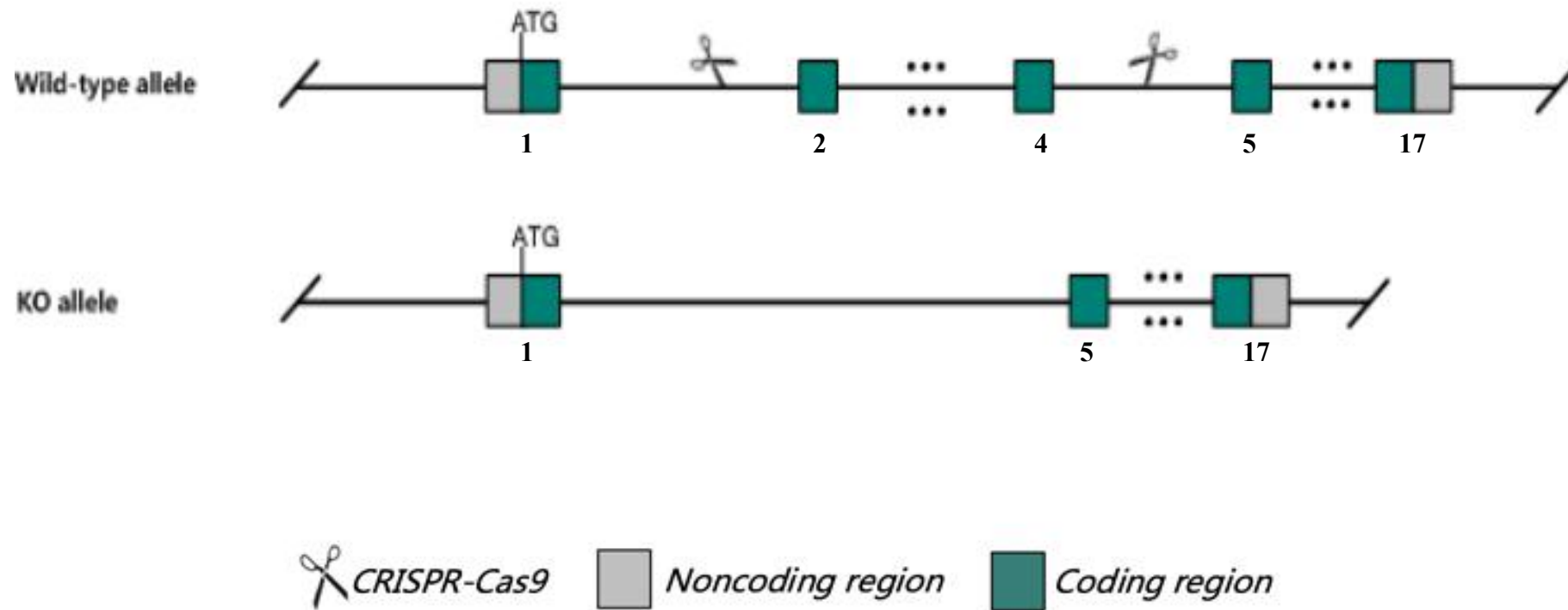
## Project Type

- Cas9-KO

## Genetic Background

- C57BL/6JGpt

# Strain Strategy



# Technical Information

- The *Sema3e* gene has 3 transcripts. According to the structure of *Sema3e* gene, exon2-exon4 of *Sema3e*-201 (ENSMUST00000073957.8) transcript is recommended as the knockout region. The region contains 341bp coding sequence. Knocking out the region will result in disruption of protein function.
- In this project we use CRISPR-Cas9 technology to modify *Sema3e* 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

**Sema3e** sema domain, immunoglobulin domain (Ig), short basic domain, secreted, (semaphorin) 3E [ *Mus musculus* (house mouse) ]

[Download Datasets](#)

Gene ID: 20349, updated on 31-Oct-2023

## Summary

|                    |   |
|--------------------|---|
| Official Symbol    | Sema3e provided by <a href="#">MGI</a>  |
| Official Full Name | sema domain, immunoglobulin domain (Ig), short basic domain, secreted, (semaphorin) 3E provided by <a href="#">MGI</a>  |
| Primary source     | <a href="#">MGI:MGI:1340034</a>   |
| See related        | <a href="#">Ensembl:ENSMUSG00000063531</a> <a href="#">AllianceGenome:MGI:1340034</a>   |
| Gene type          | protein coding  |
| RefSeq status      | VALIDATED   |
| Organism           | <a href="#">Mus musculus</a>  |
| Lineage            | Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus   |
| Also known as      | Semah; mKIAA0331; 6430702L12  |
| Summary            | Enables semaphorin receptor binding activity. Involved in several processes, including angiogenesis; negative regulation of angiogenesis; and regulation of actin cytoskeleton reorganization. Located in extracellular space. Is expressed in several structures, including hemolymphoid system gland; nervous system; nose; palatal shelf mesenchyme; and trunk mesenchyme. Human ortholog(s) of this gene implicated in CHARGE syndrome. Orthologous to human SEMA3E (semaphorin 3E). [provided by Alliance of Genome Resources, Apr 2022] |
| Expression         | Biased expression in lung adult (RPKM 7.6), placenta adult (RPKM 3.8) and 10 other tissues <a href="#">See more</a>   |
| Orthologs          | <a href="#">human</a> <a href="#">all</a>   |
| <b>NEW</b>         | Try the new <a href="#">Gene table</a>  |
|                    | Try the new <a href="#">Transcript table</a>  |

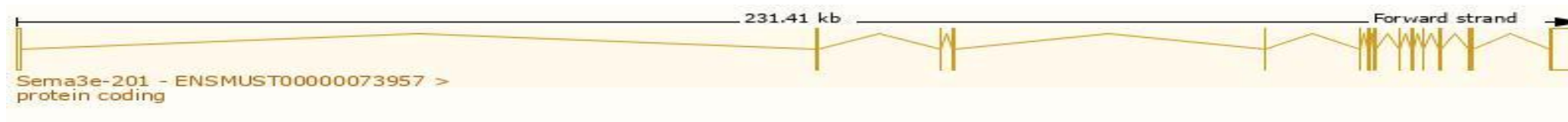
Source: <https://www.ncbi.nlm.nih.gov/>

# Transcript Information

The gene has 3 transcripts, all transcripts are shown below:

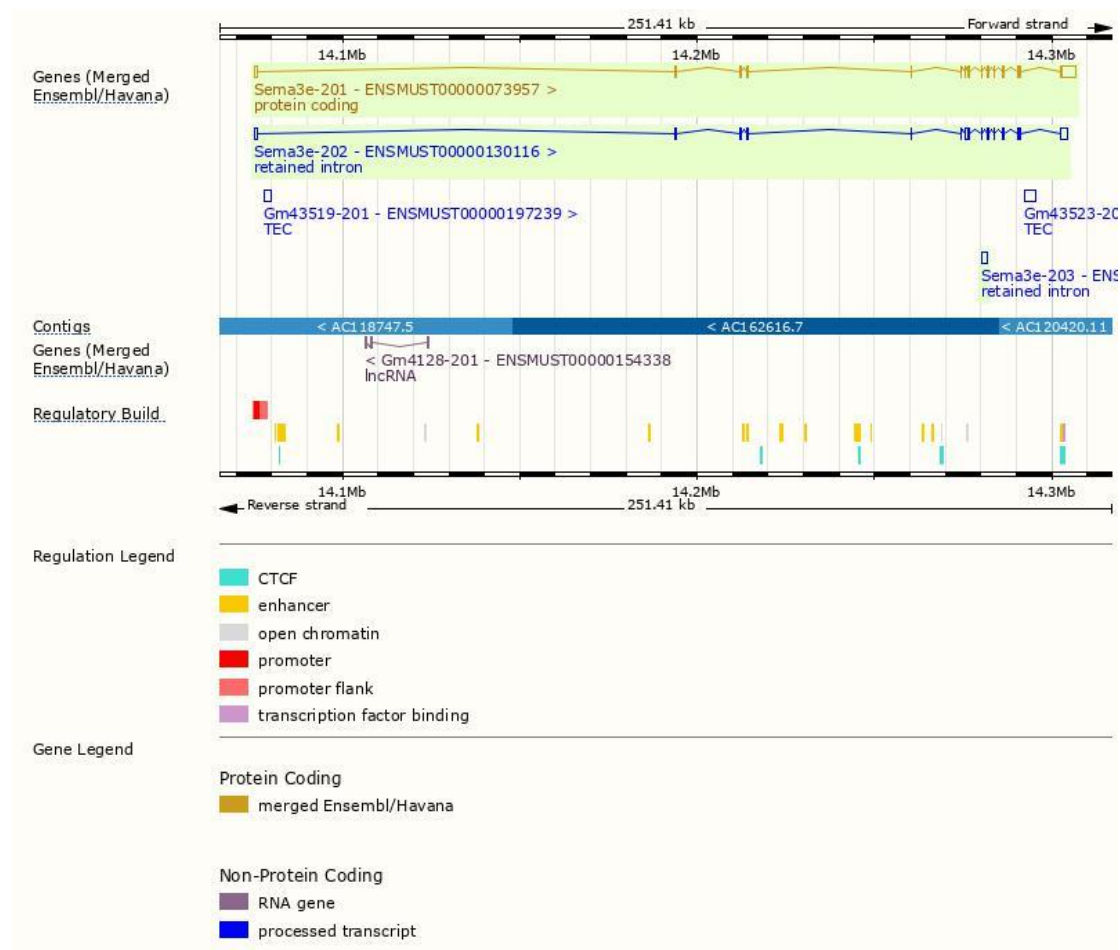
| Transcript ID                        | Name       | bp   | Protein               | Biotype         | CCDS                      | UniProt Match          | Flags   |
|--------------------------------------|------------|------|-----------------------|-----------------|---------------------------|------------------------|---|
| <a href="#">ENSMUST00000073957.8</a> | Sema3e-201 | 6861 | <a href="#">775aa</a> | Protein coding  | <a href="#">CCDS19093</a> | <a href="#">P70275</a> | Ensembl Canonical Gencode basic APPRIS P1 TSL:1 |
| <a href="#">ENSMUST00000130116.2</a> | Sema3e-202 | 5206 | No protein            | Retained intron |                           | -                      | TSL:2   |
| <a href="#">ENSMUST00000199698.2</a> | Sema3e-203 | 1849 | No protein            | Retained intron |                           | -                      | TSL:NA  |

The strategy is based on the design of *Sema3e-201* transcript, the transcription is shown below:



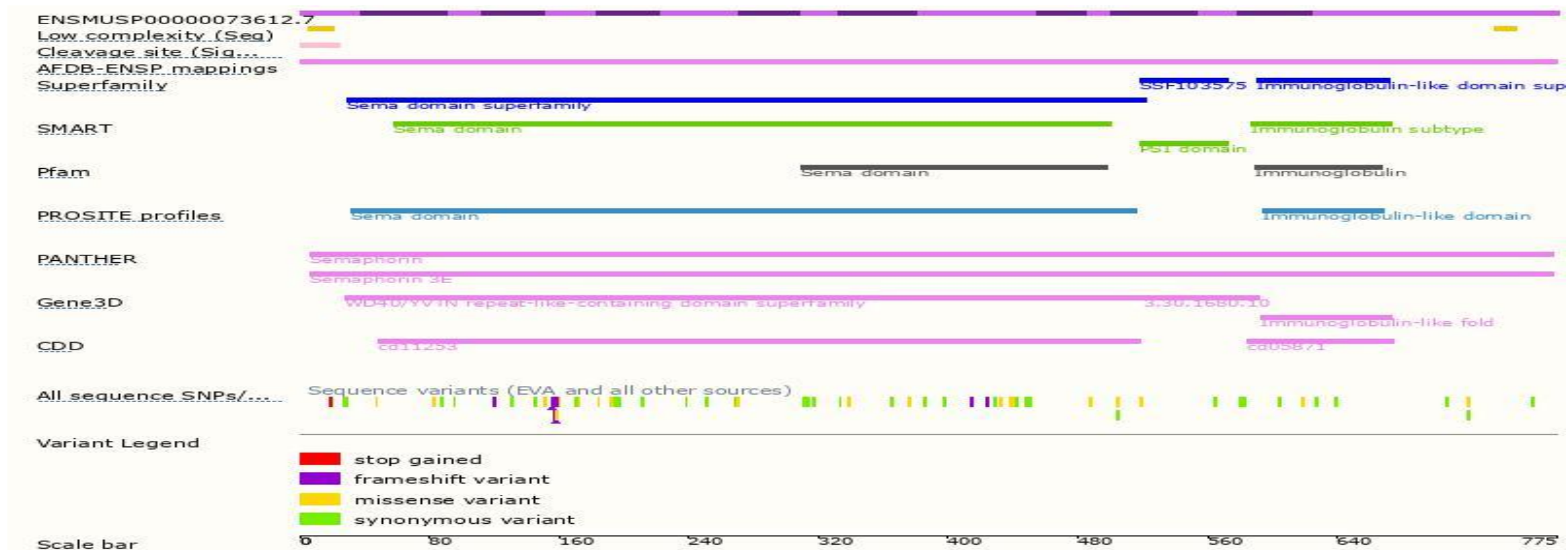
Source: <https://www.ensembl.org>

# Genomic Information



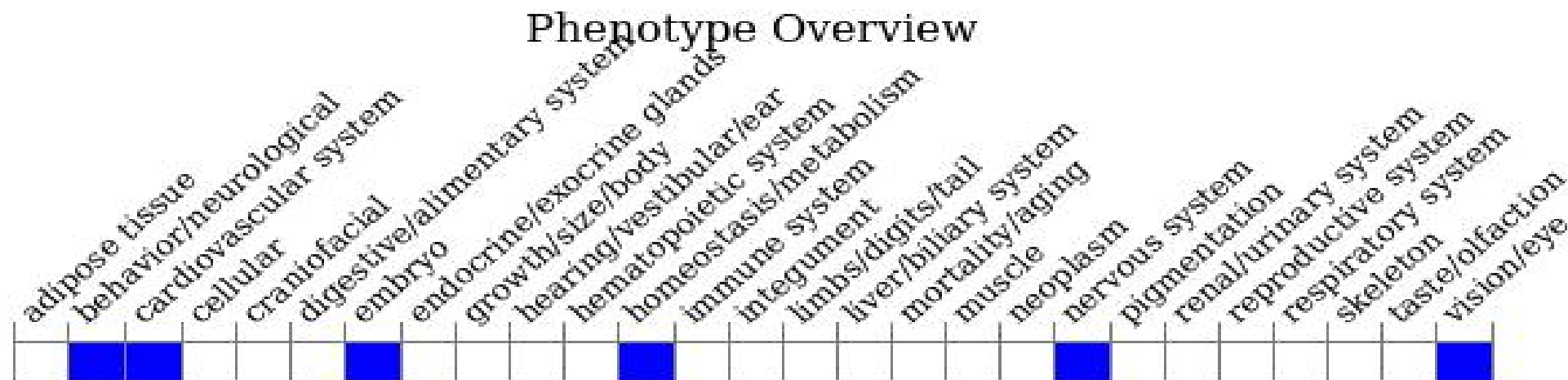


# Protein Information





# Mouse Phenotype Information (MGI)



- Homozygous null mice display abnormal intersomitic vacular development and loss of the normal segmented somite pattern. Homozygous mutants for another allele have Bergmeister papillae on the surface of the optic disc.

# Important Information

- According to MGI information, homozygous null mice display abnormal intersomitic vacular development and loss of the normal segmented somite pattern. Homozygous mutants for another allele have Bergmeister papillae on the surface of the optic disc.
- *Sema3e* is located on Chr5. 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.