

# *Nes* Cas9-KO Strategy

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**Reviewer:**

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# Project Overview

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**Project Name**

*Nes*

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**Project type**

**Cas9-KO**

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**Strain background**

**C57BL/6JGpt**

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# Knockout strategy

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



- The *Nes* gene has 3 transcripts. According to the structure of *Nes* gene, exon1-exon4 of *Nes-201* (ENSMUST00000090973.11) 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 *Nes* gene. The brief process is as follows: CRISPR/Cas9 system w

- According to the existing MGI data, Mice homozygous for a knock-out allele display a high incidence of embryonic lethality, reduced embryo and birth body size, and fewer neural stem cells and increased apoptosis in the neuroepithelium of the developing neural tube.
- The *Gm3745* gene may be deleted at the same time.
- The *Nes* 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 gene knockout on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

# Gene information (NCBI)

## Nes nestin [ *Mus musculus* (house mouse) ]

Gene ID: 18008, updated on 31-Dec-2019

### Summary

|                    |                                                                                                                                                                           |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Official Symbol    | Nes provided by <a href="#">MGI</a>                                                                                                                                       |
| Official Full Name | nestin provided by <a href="#">MGI</a>                                                                                                                                    |
| Primary source     | <a href="#">MGI:MGI:101784</a>                                                                                                                                            |
| See related        | <a href="#">Ensembl:ENSMUSG00000004891</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      | RC2; Marc2; C78523; ESTM46; Ifaprc2; AA166324                                                                                                                             |
| Expression         | Biased expression in CNS E11.5 (RPKM 68.0), CNS E14 (RPKM 14.9) and 4 other tissues <a href="#">See more</a>                                                              |
| Orthologs          | <a href="#">human</a> <a href="#">all</a>                                                                                                                                 |

### Genomic context

Location: 3 F1; 3 38.78 cM

Exon count: 4

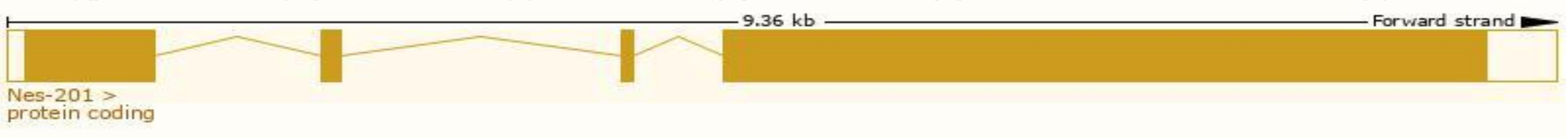
[See Nes in Genome Data Viewer](#)

# Transcript information (Ensembl)

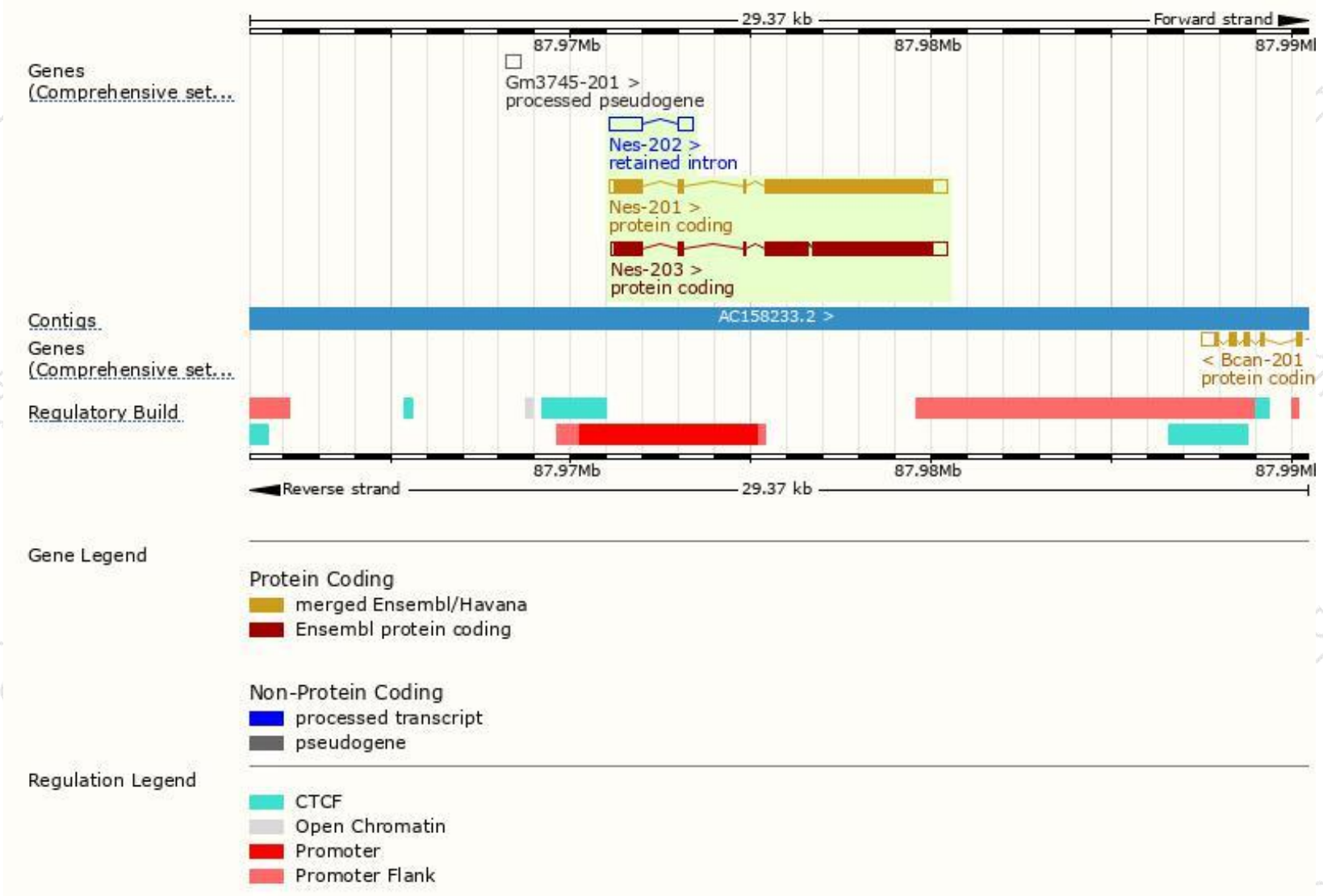
The gene has 3 transcripts,all transcripts are shown below:

| Name    | Transcript ID                         | bp   | Protein                | Biotype         | CCDS                      | UniProt                | Flags                           |
|---------|---------------------------------------|------|------------------------|-----------------|---------------------------|------------------------|---------------------------------|
| Nes-201 | <a href="#">ENSMUST00000090973.11</a> | 6126 | <a href="#">1864aa</a> | Protein coding  | <a href="#">CCDS17461</a> | <a href="#">Q6P5H2</a> | TSL:1 GENCODE basic APPRIS P2   |
| Nes-203 | <a href="#">ENSMUST00000160694.1</a>  | 5958 | <a href="#">1820aa</a> | Protein coding  | -                         | <a href="#">Q6P5H2</a> | TSL:1 GENCODE basic APPRIS ALT2 |
| Nes-202 | <a href="#">ENSMUST00000159830.1</a>  | 1311 | No protein             | Retained intron | -                         | -                      | TSL:1                           |

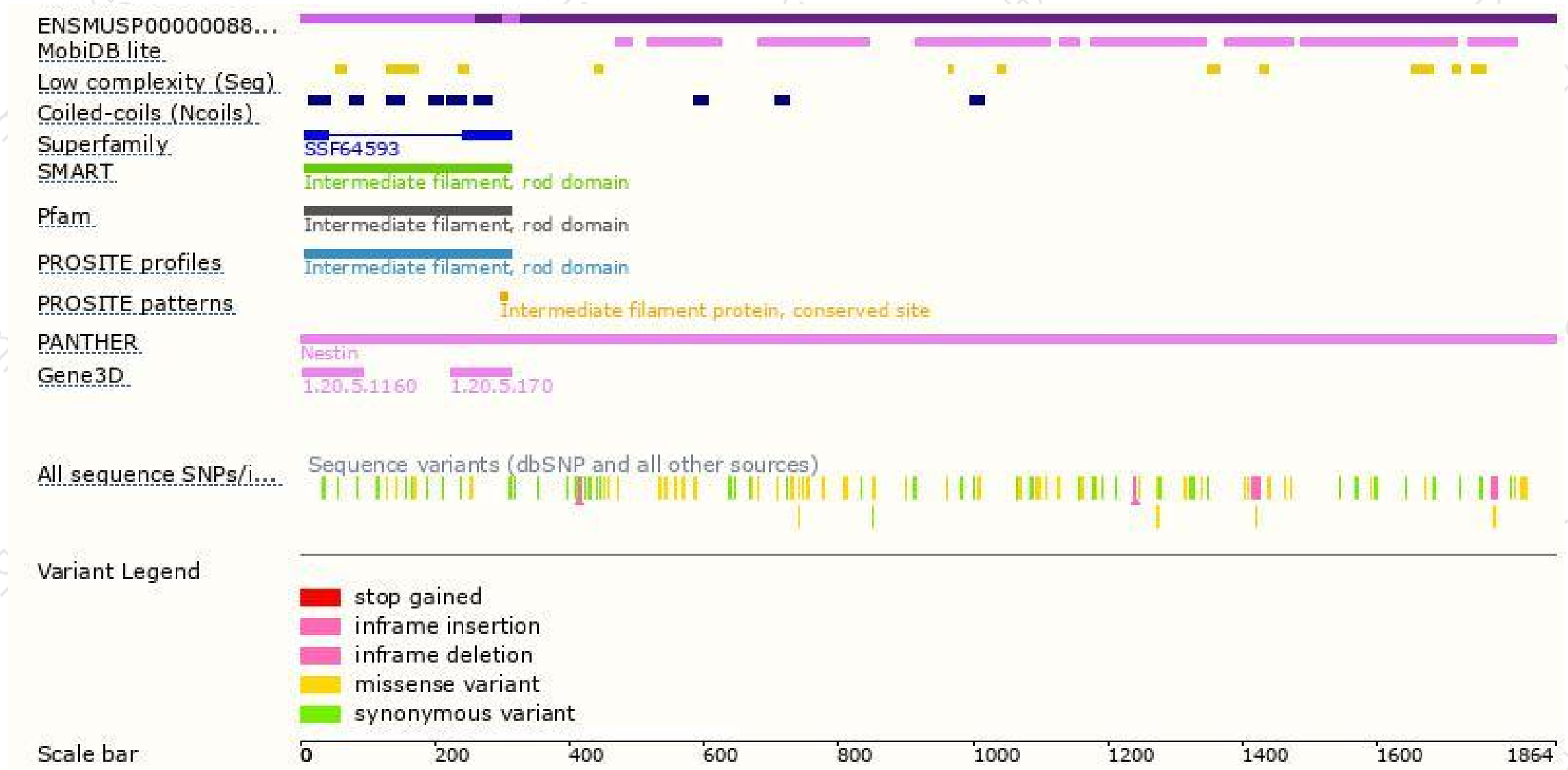
The strategy is based on the design of *Nes-201* transcript,The transcription is shown below



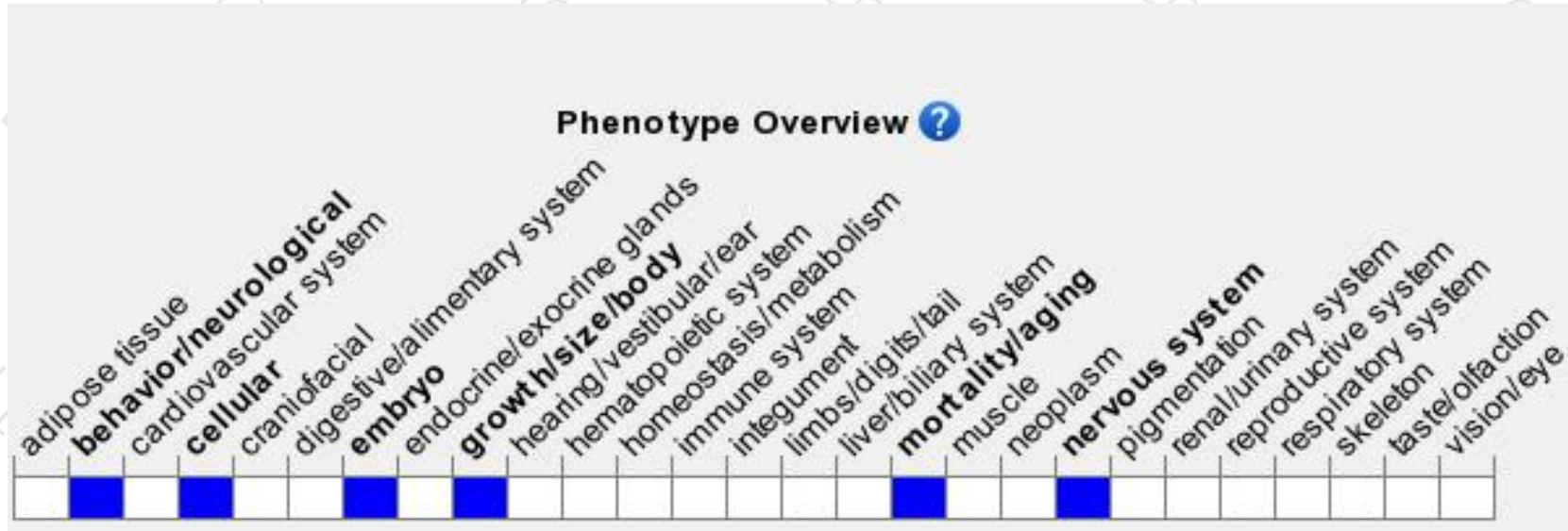
# Genomic location distribution



# 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, Mice homozygous for a knock-out allele display a high incidence of embryonic lethality, reduced embryo and birth body size, and fewer neural stem cells and increased apoptosis in the neuroepithelium of the developing neural tube.

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

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