

# ***Notch1* Cas9-KO Strategy**

**Designer:**

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**Design Date:**

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# Project Overview

**Project Name**

***Notch1***

**Project type**

**Cas9-KO**

**Strain background**

**C57BL/6JGpt**

# Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Notch1* gene. The schematic diagram is as follows:



- The *Notch1* gene has 11 transcripts. According to the structure of *Notch1* gene, exon2 of *Notch1-201* (ENSMUST00000028288.4) transcript is recommended as the knockout region. The region contains 79bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Notch1* gene. The brief process is as follows: CRISPR/Cas9 system

- According to the existing MGI data, Homozygotes for null alleles exhibit defects in embryonic development resulting in lethality at some point in organogenesis. Lethal phenotype may be affected by genetic background.
- The *Notch1* gene is located on the Chr2. 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)

## Notch1 notch 1 [Mus musculus (house mouse)]

Gene ID: 18128, updated on 2-Apr-2019

### Summary



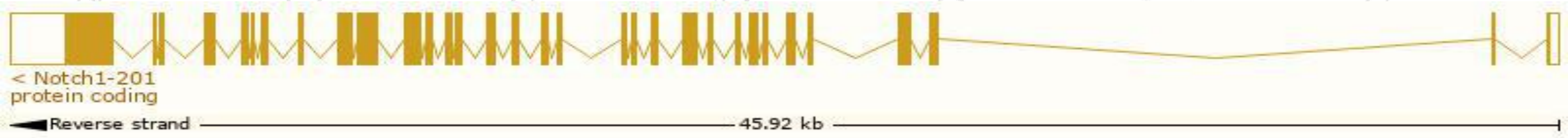
|                           |                                                                                                                                                                           |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Official Symbol</b>    | Notch1 provided by <a href="#">MGI</a>                                                                                                                                    |
| <b>Official Full Name</b> | notch 1 provided by <a href="#">MGI</a>                                                                                                                                   |
| <b>Primary source</b>     | <a href="#">MGI:MGI:97363</a>                                                                                                                                             |
| <b>See related</b>        | <a href="#">Ensembl:ENSMUSG00000026923</a>                                                                                                                                |
| <b>Gene type</b>          | protein coding                                                                                                                                                            |
| <b>RefSeq status</b>      | VALIDATED                                                                                                                                                                 |
| <b>Organism</b>           | <a href="#">Mus musculus</a>                                                                                                                                              |
| <b>Lineage</b>            | Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus |
| <b>Also known as</b>      | 9930111A19Rik, Mis6, N1, Tan1, lin-12                                                                                                                                     |
| <b>Expression</b>         | Broad expression in thymus adult (RPKM 56.2), lung adult (RPKM 46.1) and 21 other tissues <a href="#">See more</a>                                                        |
| <b>Orthologs</b>          | <a href="#">human</a> <a href="#">all</a>                                                                                                                                 |

# Transcript information (Ensembl)

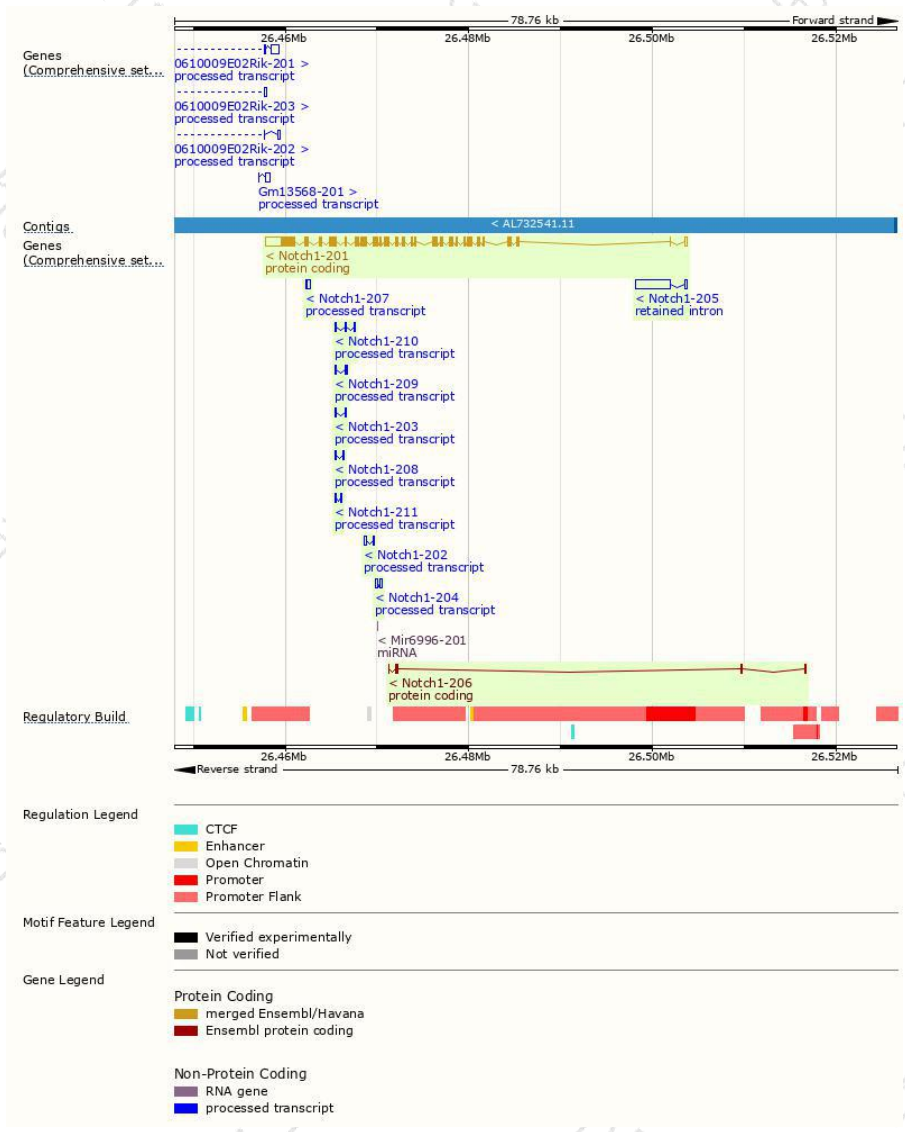
The gene has 11 transcripts,all transcripts are shown below:

| Name       | Transcript ID                        | bp   | Protein                | Biotype              | CCDS                      | UniProt                | Flags                         |
|------------|--------------------------------------|------|------------------------|----------------------|---------------------------|------------------------|-------------------------------|
| Notch1-201 | <a href="#">ENSMUST00000028288.4</a> | 9488 | <a href="#">2531aa</a> | Protein coding       | <a href="#">CCDS15806</a> | <a href="#">Q01705</a> | TSL:1 GENCODE basic APPRIS P1 |
| Notch1-206 | <a href="#">ENSMUST00000132820.1</a> | 512  | <a href="#">92aa</a>   | Protein coding       | -                         | <a href="#">A2AIX5</a> | CDS 3' incomplete TSL:1       |
| Notch1-204 | <a href="#">ENSMUST00000129506.1</a> | 459  | No protein             | Processed transcript | -                         | -                      | TSL:1                         |
| Notch1-207 | <a href="#">ENSMUST00000132941.1</a> | 434  | No protein             | Processed transcript | -                         | -                      | TSL:2                         |
| Notch1-202 | <a href="#">ENSMUST00000123873.1</a> | 406  | No protein             | Processed transcript | -                         | -                      | TSL:3                         |
| Notch1-209 | <a href="#">ENSMUST00000140082.7</a> | 332  | No protein             | Processed transcript | -                         | -                      | TSL:1                         |
| Notch1-210 | <a href="#">ENSMUST00000147481.1</a> | 324  | No protein             | Processed transcript | -                         | -                      | TSL:1                         |
| Notch1-203 | <a href="#">ENSMUST00000126872.7</a> | 284  | No protein             | Processed transcript | -                         | -                      | TSL:1                         |
| Notch1-211 | <a href="#">ENSMUST00000148948.7</a> | 184  | No protein             | Processed transcript | -                         | -                      | TSL:1                         |
| Notch1-208 | <a href="#">ENSMUST00000138034.7</a> | 157  | No protein             | Processed transcript | -                         | -                      | TSL:1                         |
| Notch1-205 | <a href="#">ENSMUST00000131393.1</a> | 4132 | No protein             | Retained intron      | -                         | -                      | TSL:1                         |

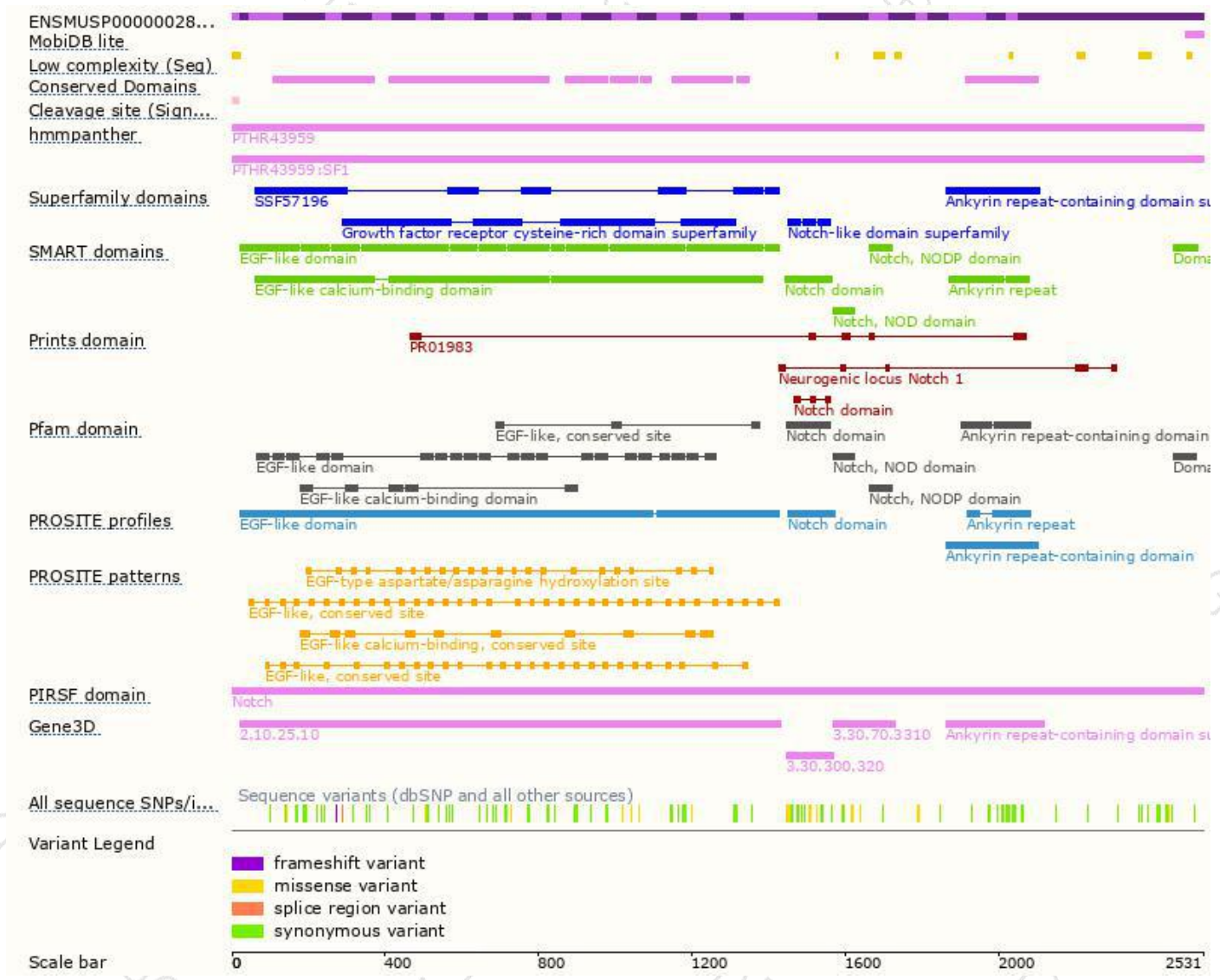
The strategy is based on the design of *Notch1-201* transcript,The transcription is shown below



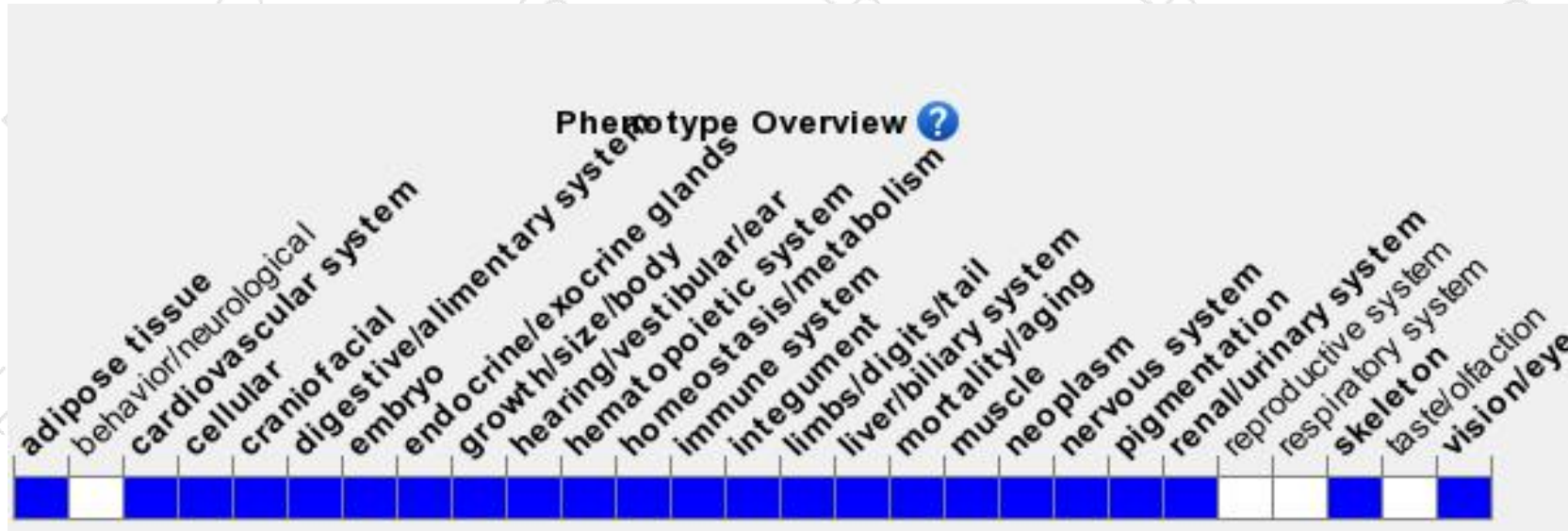
# Genomic location distribution



# 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 null alleles exhibit defects in embryonic development resulting in lethality at some point in organogenesis. Lethal phenotype may be affected by genetic background.

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

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