

# ***Bnip2*** Cas9-KO Strategy

**Designer:**

**JiaYu**

**Reviewer:**

**Xiaojing Li**

**Design Date:**

**2020-2-19**

# Project Overview

**Project Name**

***Bnip2***

**Project type**

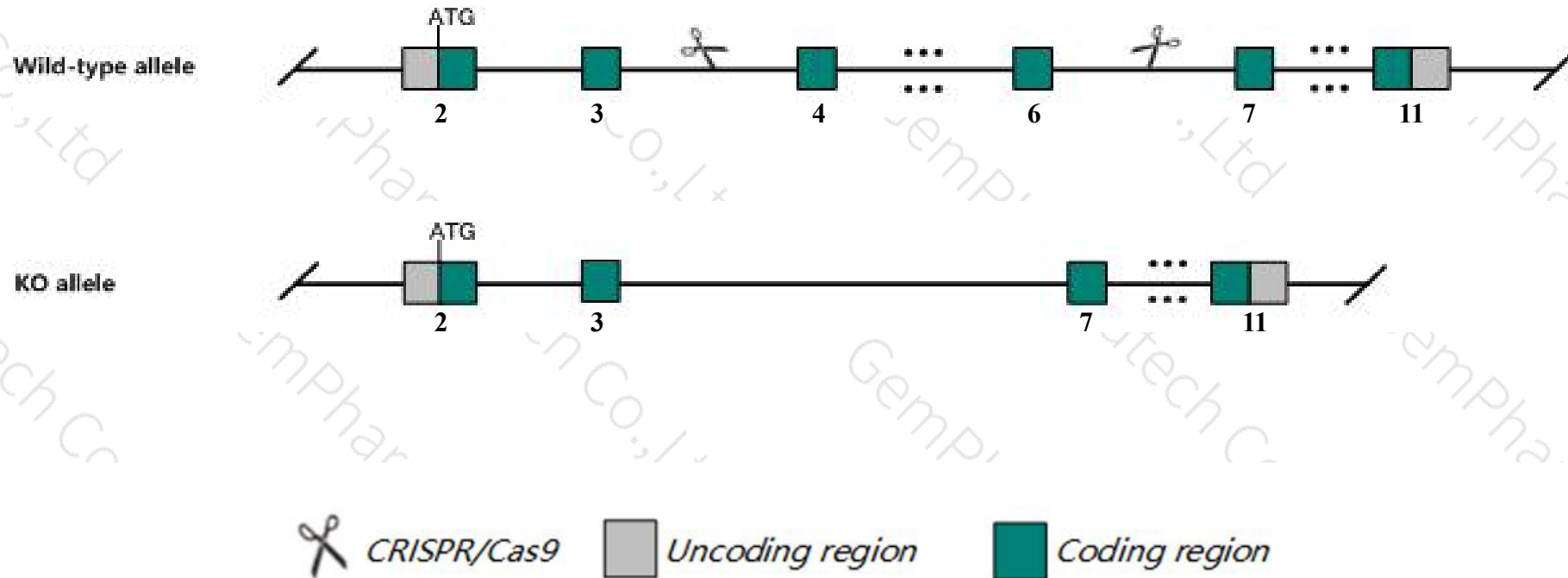
**Cas9-KO**

**Strain background**

**C57BL/6JGpt**

# Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Bnip2* gene. The schematic diagram is as follows:



- The *Bnip2* gene has 8 transcripts. According to the structure of *Bnip2* gene, exon4-exon6 of *Bnip2-201* (ENSMUST00000034754.11) transcript is recommended as the knockout region. The region contains 457bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Bnip2* gene. The brief process is as follows: CRISPR/Cas9 system

- The *Bnip2* gene is located on the Chr9. 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)

## Bnip2 BCL2/adenovirus E1B interacting protein 2 [Mus musculus (house mouse)]

Gene ID: 12175, updated on 31-Jan-2019

### Summary



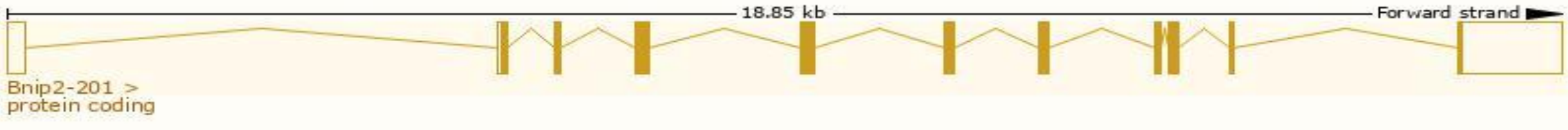
|                           |                                                                                                                                                                           |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Official Symbol</b>    | Bnip2 provided by <a href="#">MGI</a>                                                                                                                                     |
| <b>Official Full Name</b> | BCL2/adenovirus E1B interacting protein 2 provided by <a href="#">MGI</a>                                                                                                 |
| <b>Primary source</b>     | <a href="#">MGI:MGI:109327</a>                                                                                                                                            |
| <b>See related</b>        | <a href="#">Ensembl:ENSMUSG00000011958</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>      | 5730523P12Rik, BNIP2beta, Nip21                                                                                                                                           |
| <b>Expression</b>         | Ubiquitous expression in bladder adult (RPKM 17.0), CNS E11.5 (RPKM 12.5) and 26 other tissues <a href="#">See more</a>                                                   |
| <b>Orthologs</b>          | <a href="#">human</a> <a href="#">all</a>                                                                                                                                 |

# Transcript information (Ensembl)

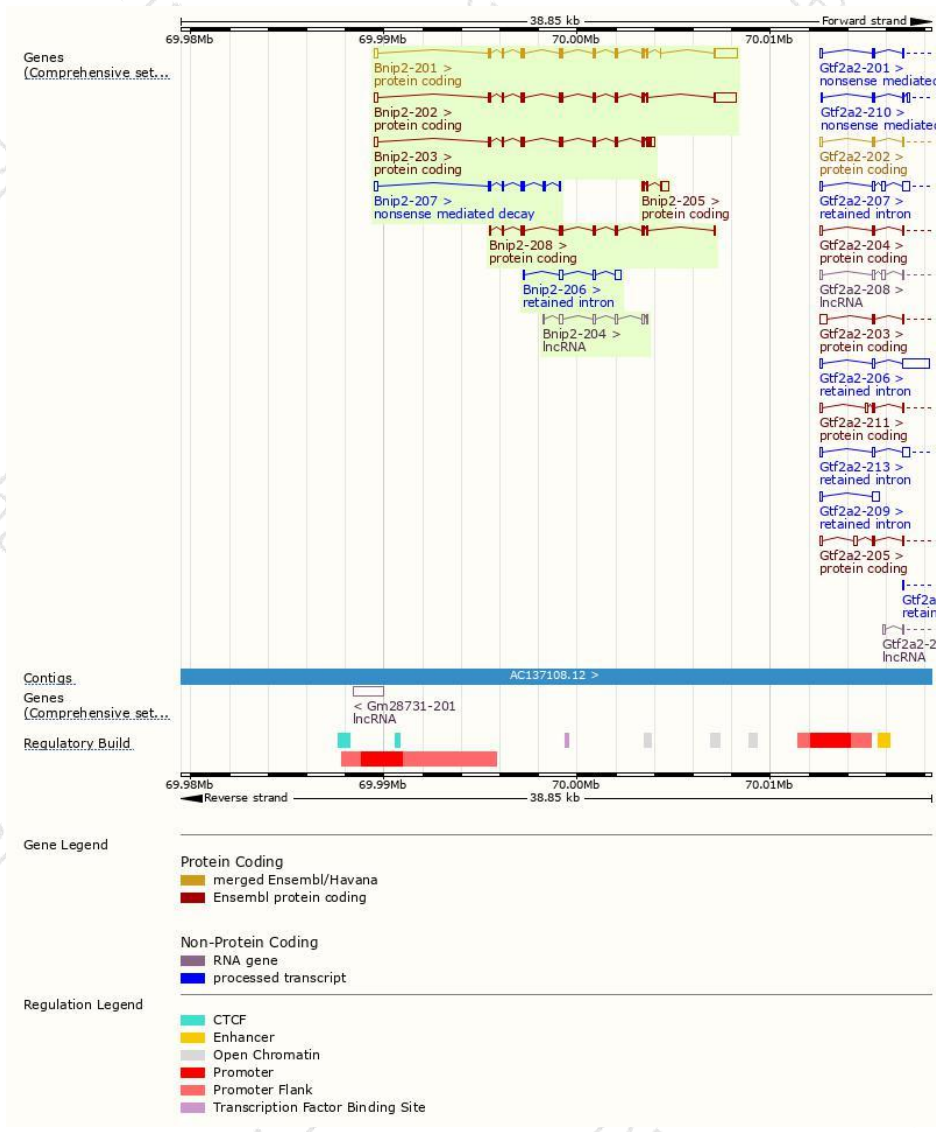
The gene has 8 transcripts,all transcripts are shown below:

| Name      | Transcript ID                         | bp   | Protein               | Biotype                 | CCDS                      | UniProt                | Flags                           |
|-----------|---------------------------------------|------|-----------------------|-------------------------|---------------------------|------------------------|---------------------------------|
| Bnip2-201 | <a href="#">ENSMUST00000034754.11</a> | 2464 | <a href="#">326aa</a> | Protein coding          | <a href="#">CCDS23319</a> | <a href="#">Q54940</a> | TSL:1 GENCODE basic APPRIS P4   |
| Bnip2-202 | <a href="#">ENSMUST00000085393.12</a> | 2328 | <a href="#">314aa</a> | Protein coding          | <a href="#">CCDS23318</a> | <a href="#">Q91VL0</a> | TSL:1 GENCODE basic APPRIS ALT2 |
| Bnip2-208 | <a href="#">ENSMUST00000165389.7</a>  | 945  | <a href="#">314aa</a> | Protein coding          | <a href="#">CCDS23318</a> | <a href="#">Q91VL0</a> | TSL:1 GENCODE basic APPRIS ALT2 |
| Bnip2-203 | <a href="#">ENSMUST00000117450.7</a>  | 1465 | <a href="#">348aa</a> | Protein coding          | -                         | <a href="#">G5E8U9</a> | TSL:1 GENCODE basic APPRIS ALT2 |
| Bnip2-205 | <a href="#">ENSMUST00000137472.1</a>  | 644  | <a href="#">86aa</a>  | Protein coding          | -                         | <a href="#">F6VF29</a> | CDS 5' incomplete TSL:3         |
| Bnip2-207 | <a href="#">ENSMUST00000154772.7</a>  | 676  | <a href="#">107aa</a> | Nonsense mediated decay | -                         | <a href="#">D6RE50</a> | TSL:3                           |
| Bnip2-206 | <a href="#">ENSMUST00000143049.7</a>  | 621  | No protein            | Retained intron         | -                         | -                      | TSL:2                           |
| Bnip2-204 | <a href="#">ENSMUST00000133307.1</a>  | 643  | No protein            | lncRNA                  | -                         | -                      | TSL:3                           |

The strategy is based on the design of *Bnip2-201* transcript,The transcription is shown below

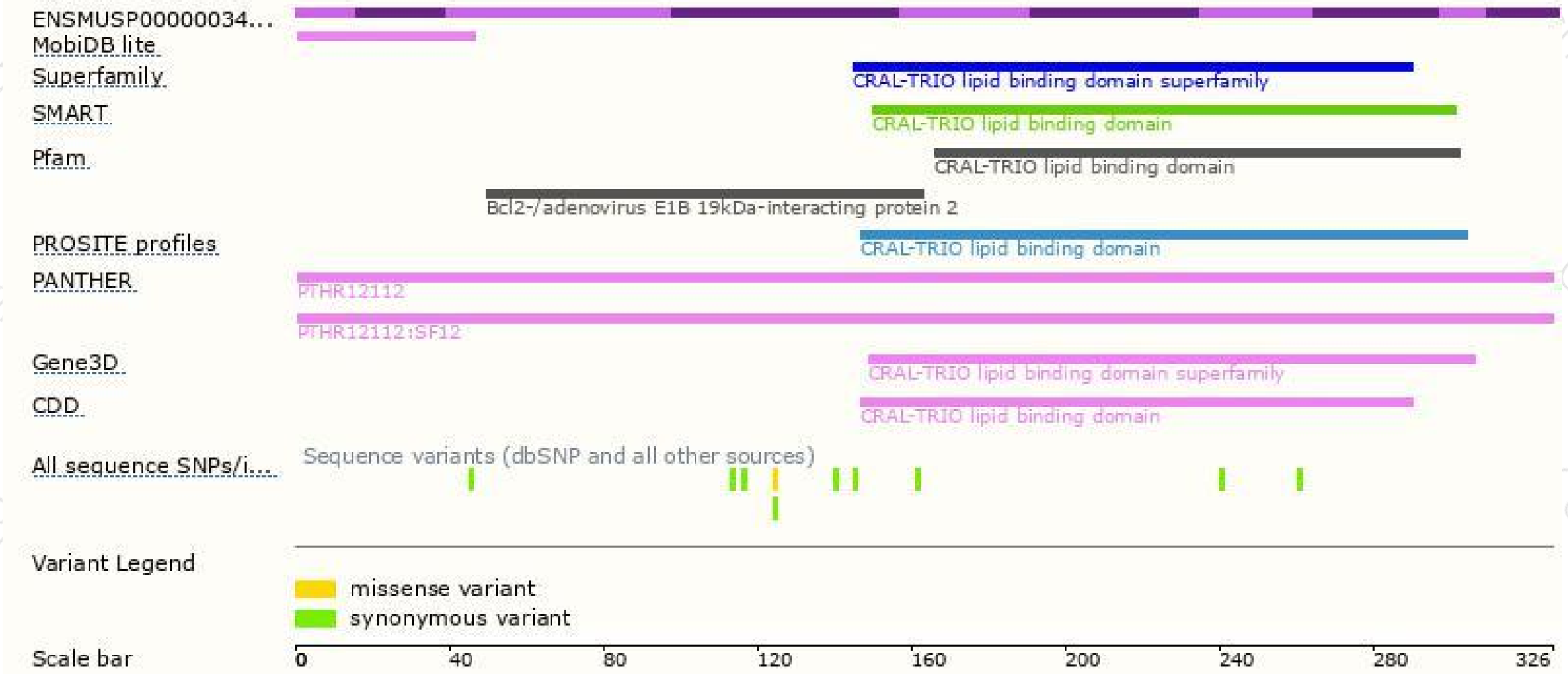


# Genomic location distribution

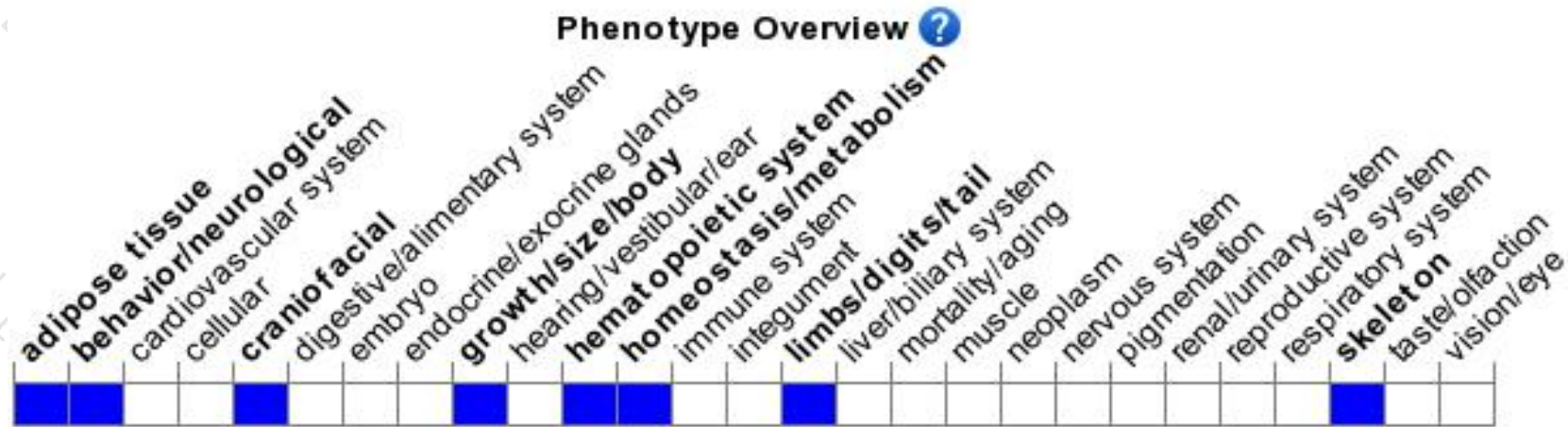




# Protein domain



# Mouse phenotype description(MGI )



*Phenotypes affected by the gene are marked in blue. Data quoted from MGI database(<http://www.informatics.jax.org/>).*

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

Tel: 400-9660890

