

Btg1 Cas9-CKO Strategy

Designer:

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Design Date:

2018/11/13

Project Overview



Project Name

Btg1

Project type

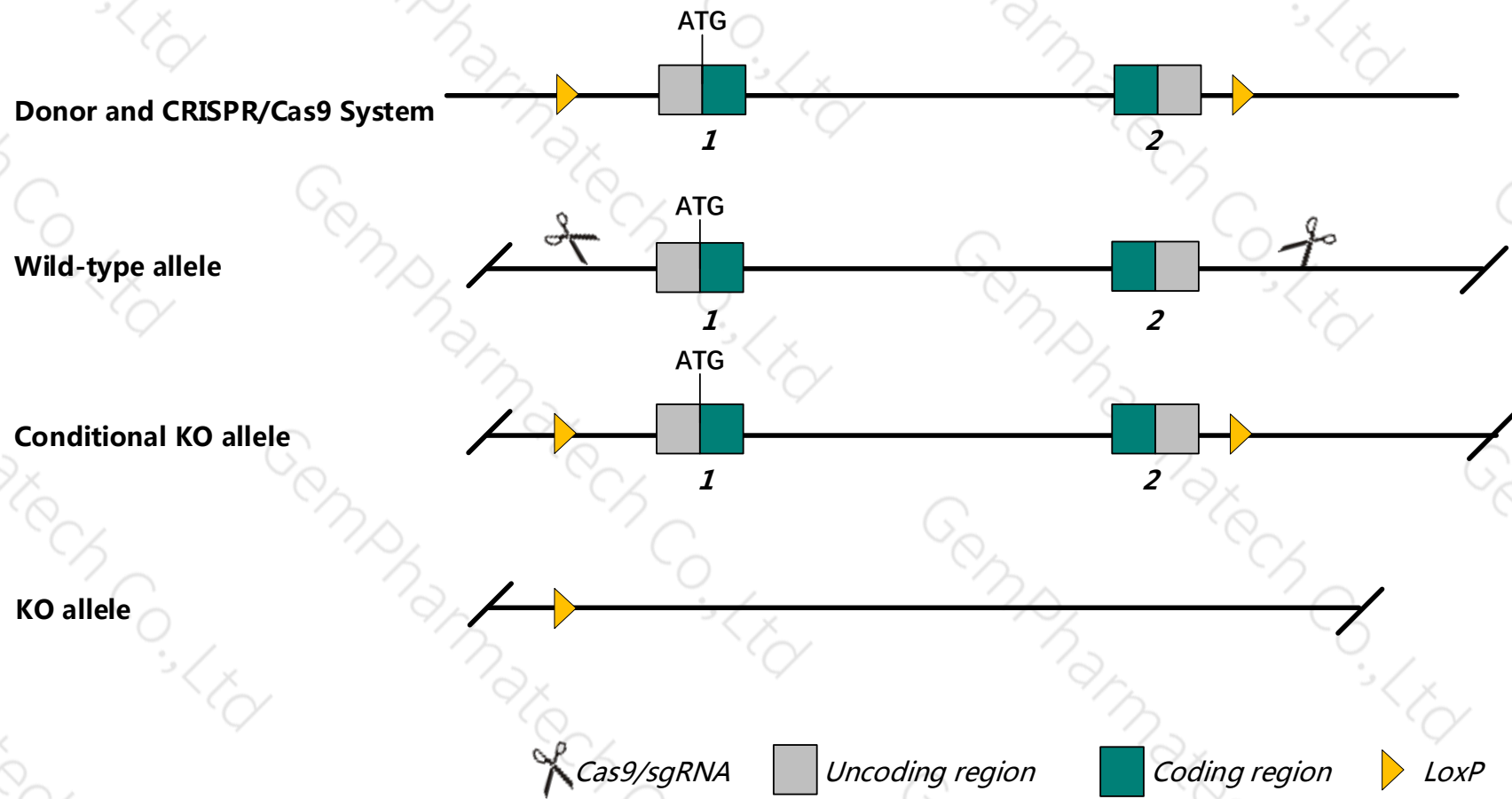
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Btg1* gene. The schematic diagram is as follows:



- The *Btg1* gene has 2 transcripts. According to the structure of *Btg1* gene, exon1~exon2 of *Btg1*-201 (ENSMUST00000038377.8) 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 *Btg1* gene. The brief process is as follows: sgRNA was transcribed in vitro, donor vector was constructed. Cas9, sgRNA and Donor 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.
- The flox mice was knocked out after mating with mice expressing Cre recombinase, resulting in the loss of function of the target gene in specific tissues or cell types.

- According to the existing MGI data, Mice homozygous for a knock-out allele exhibit abnormal neurogenesis in the dentate gyrus, decreased proliferation and increased apoptosis in the dentate gyrus and subventricular zone, impaired spatial learning and abnormal contextual conditioning behavior.
- The *Btg1* gene is located on the Chr10. 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

Gene information (NCBI)

Btg1 B cell translocation gene 1, anti-proliferative [*Mus musculus* (house mouse)]

Gene ID: 12226, updated on 31-Jan-2019

Summary

Official Symbol Btg1 provided by [MGI](#)
Official Full Name B cell translocation gene 1, anti-proliferative provided by [MGI](#)
Primary source [MGI:MGI:88215](#)
See related [Ensembl:ENSMUSG00000036478](#)
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 AI426953; AW546738
Expression Ubiquitous expression in spleen adult (RPKM 18.3), bladder adult (RPKM 12.4) and 28 other tissues [See more](#)
Orthologs [human](#) [all](#)

Genomic context

Location: 10; 10 C3

See Btg1 in [Genome Data Viewer](#)

Exon count: 2

| Annotation release | Status | Assembly | Chr | Location |
|---------------------|-------------------|--|-----|----------------------------------|
| 106 | current | GRCm38.p4 (GCF_000001635.24) | 10 | NC_000076.6 (96617001..96622813) |
| Build 37.2 | previous assembly | MGSCv37 (GCF_000001635.18) | 10 | NC_000076.5 (96079635..96085447) |

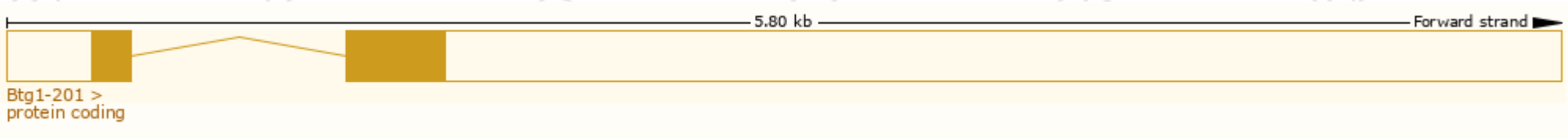


Transcript information (Ensembl)

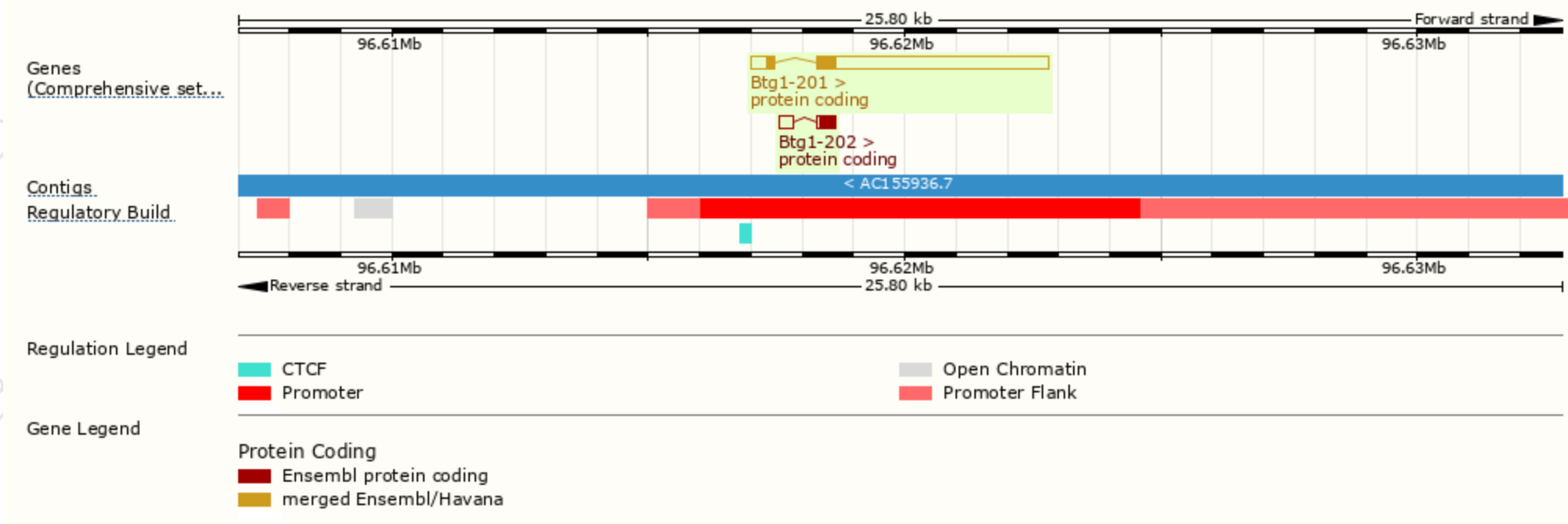
The gene has 2 transcripts, and the transcripts are shown below:

| Name | Transcript ID | bp | Protein | Biotype | CCDS | UniProt | Flags |
|----------|--------------------------------------|------|-----------------------|----------------|---------------------------|---|-------------------------------|
| Btg1-201 | ENSMUST00000038377.8 | 5001 | 171aa | Protein coding | CCDS24140 | P62325 Q3UEG0 | TSL:1 GENCODE basic APPRIS P1 |
| Btg1-202 | ENSMUST00000218953.1 | 668 | 96aa | Protein coding | - | A0A1W2P7F9 | TSL:2 GENCODE basic |

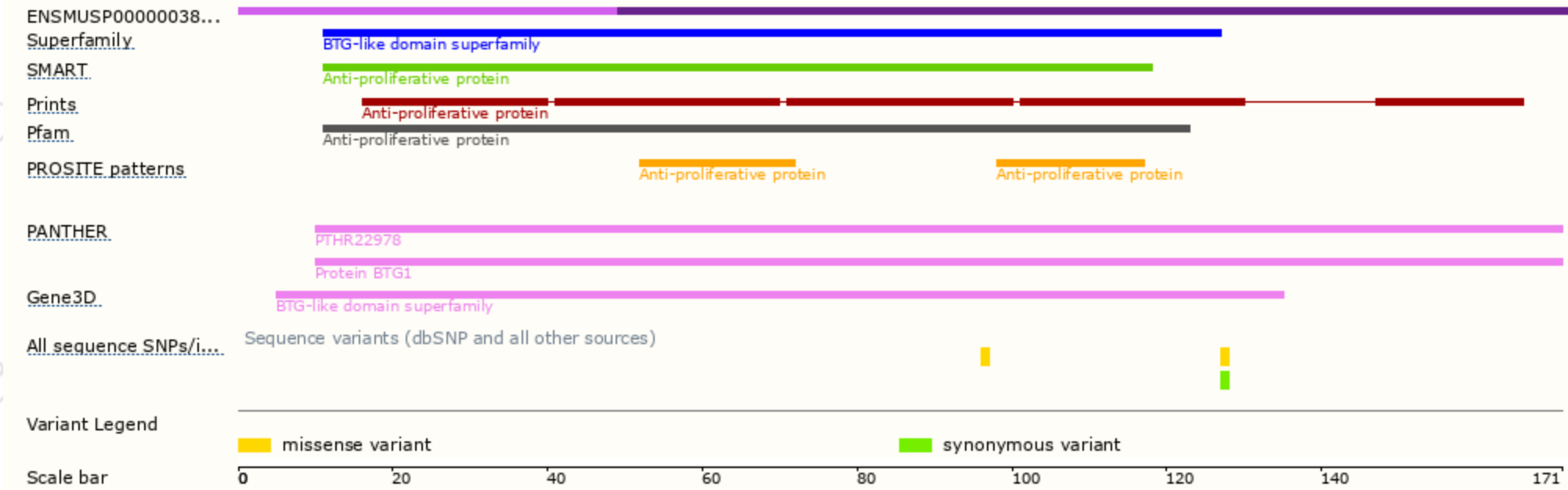
The strategy is based on the design of *Btg1*-201 transcript, The transcription is shown below



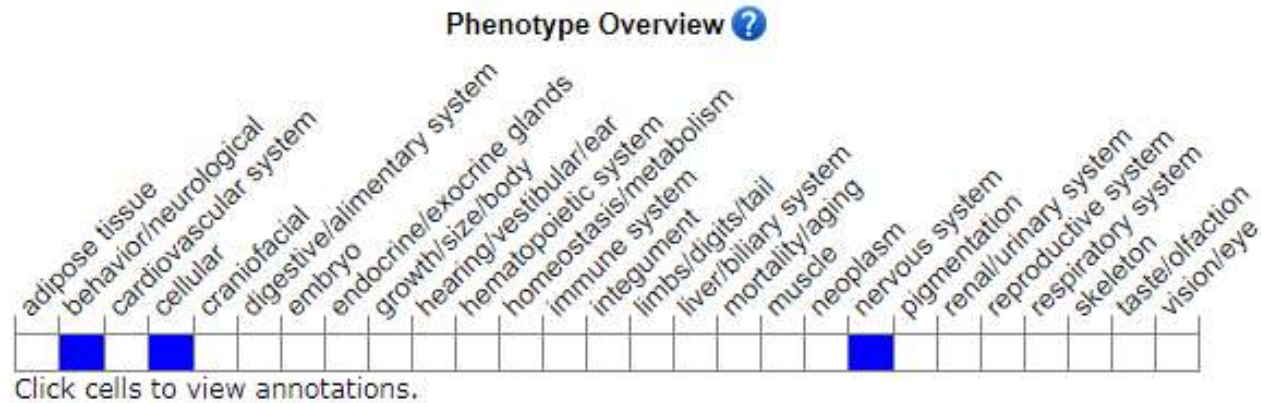
Genomic location distribution



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/>).

Mice homozygous for a knock-out allele exhibit abnormal neurogenesis in the dentate gyrus, decreased proliferation and increased apoptosis in the dentate gyrus and subventricular zone, impaired spatial learning and abnormal contextual conditioning behavior.

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