

***Btd* Cas9-KO Strategy**

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Reviewer:

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Project Overview

Project Name

Btd

Project type

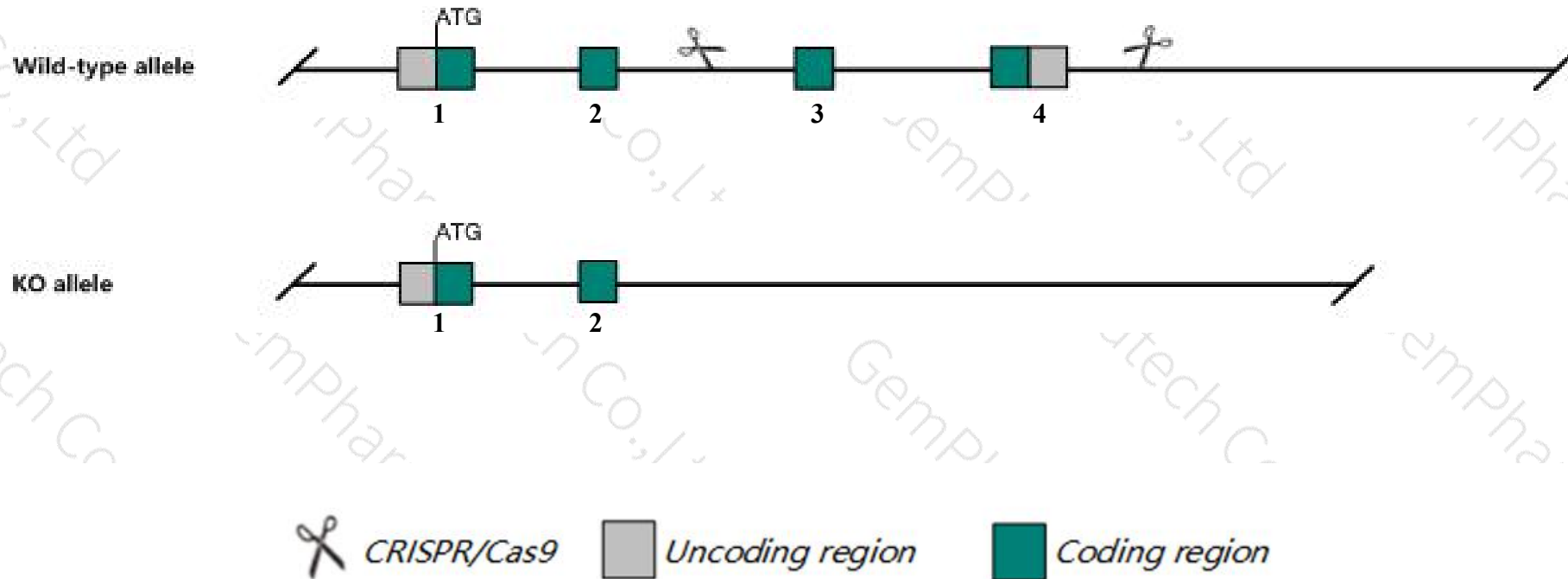
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

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



- The *Btd* gene has 2 transcripts. According to the structure of *Btd* gene, exon3-exon4 of *Btd-201* (ENSMUST00000090147.6) transcript is recommended as the knockout region. The region contains most 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 *Btd* gene. The brief process is as follows: CRISPR/Cas9 system will

- According to the existing MGI data, Mice homozygous for a knock-out allele exhibit behavioral/neurological defects, weakness, bone loss, weight loss, and alopecia when fed a biotin-deprived diet.
- The *Btd* gene is located on the Chr14. 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)

Btd biotinidase [*Mus musculus* (house mouse)]

Gene ID: 26363, updated on 14-Sep-2019

Summary

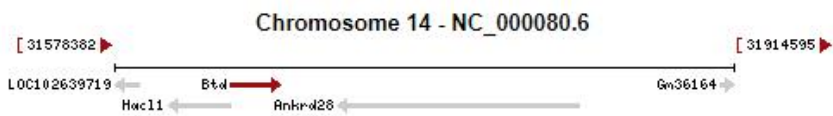
Official Symbol	Btd provided by MGI
Official Full Name	biotinidase provided by MGI
Primary source	MGI:MGI:1347001
See related	Ensembl:ENSMUSG000000021900
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Expression	Ubiquitous expression in kidney adult (RPKM 42.3), liver adult (RPKM 36.1) and 28 other tissues See more
Orthologs	human all

Genomic context

Location: 14; 14 B See Btd in [Genome Data Viewer](#)

Exon count: 4

Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	14	NC_000080.6 (31641012..31668197)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	14	NC_000080.5 (32454243..32481383)

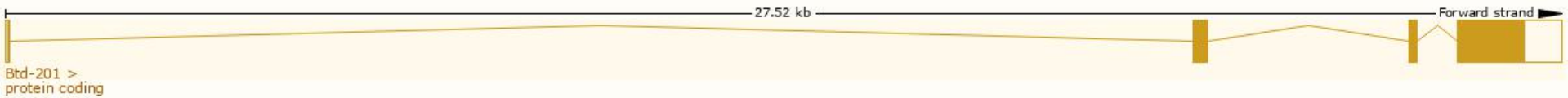


Transcript information (Ensembl)

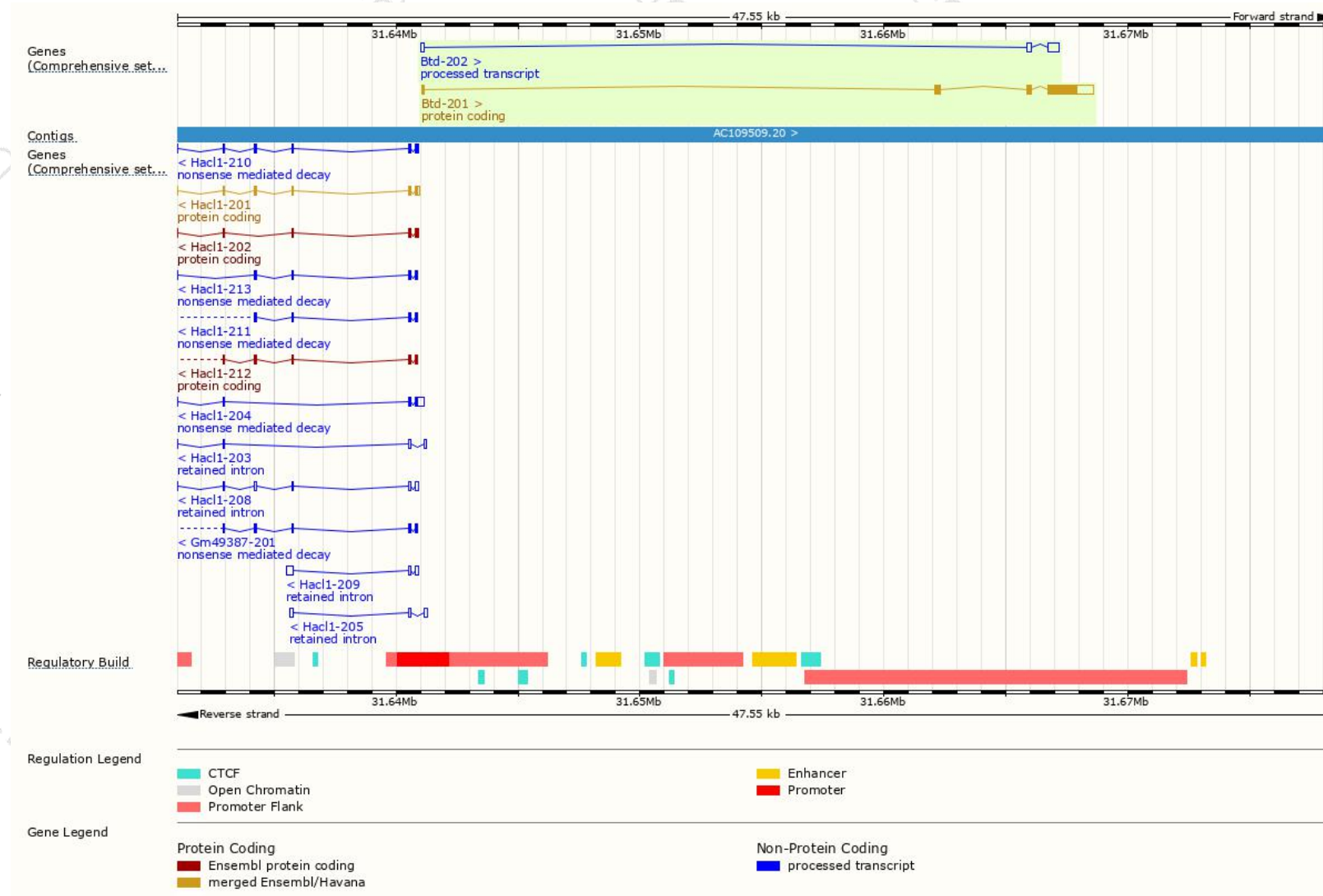
The gene has 2 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Btd-201	ENSMUST00000090147.6	2324	529aa	Protein coding	CCDS36857	A0A0R4J131	TSL:1 GENCODE basic APPRIS P1
Btd-202	ENSMUST00000128014.1	689	No protein	Processed transcript	-	-	TSL:2

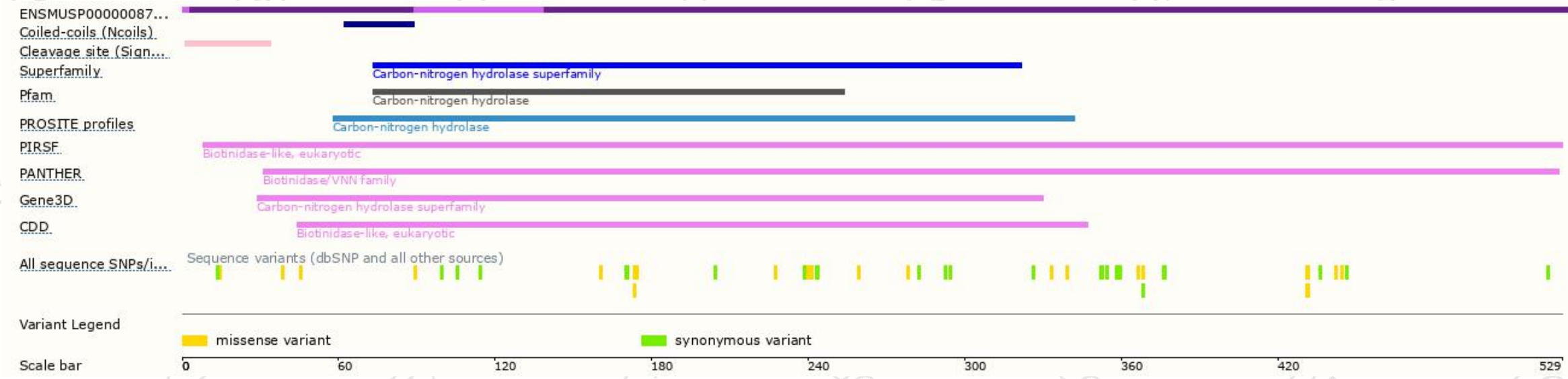
The strategy is based on the design of *Btd-201* transcript,The transcription is shown below



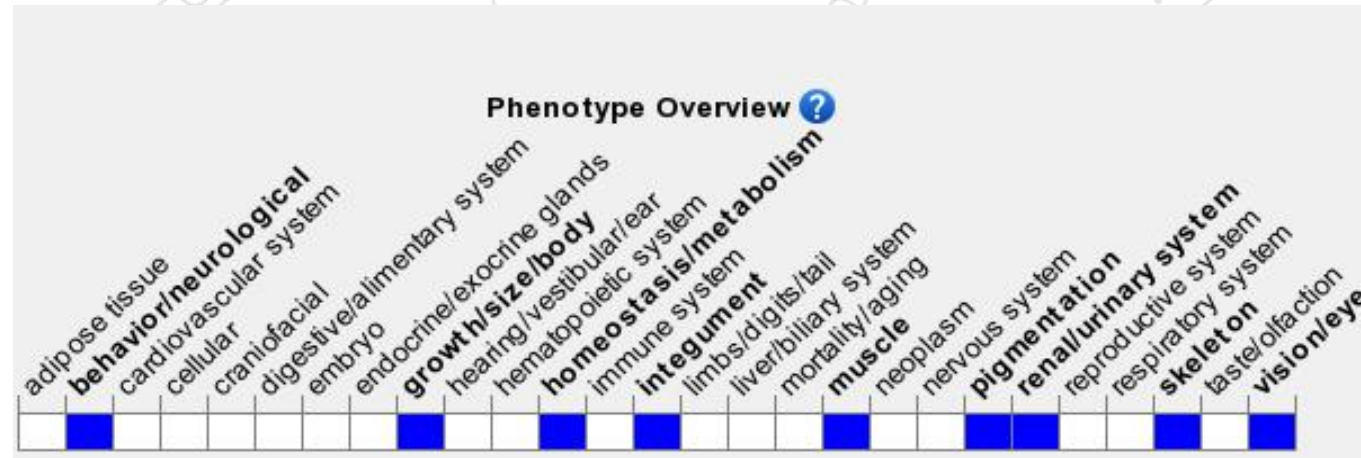
Genomic location distribution



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 exhibit behavioral/neurological defects, weakness, bone loss, weight loss, and alopecia when fed a biotin-deprived diet.

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

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