

Itm2b Cas9-KO Strategy

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Project Overview

Project Name

Itm2b

Project type

Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Itm2b* gene. The schematic diagram is as follows:



- The *Itm2b* gene has 5 transcripts. According to the structure of *Itm2b* gene, exon2-exon5 of *Itm2b-201* (ENSMUST00000022704.8) transcript is recommended as the knockout region. The region contains 598bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Itm2b* gene. The brief process is as follows: CRISPR/Cas9 system

- According to the existing MGI data, Mice homozygous for a null mutation display increased levels of soluble APP fragments in the brain. Mice homozygous for a knock-in allele exhibit impaired object recognition, impaired contextual conditioning, and impaired spatial working memory.
- Transcript *Itm2b*-204 may not be affected.
- The *Itm2b* 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)

Itm2b integral membrane protein 2B [*Mus musculus* (house mouse)]

Gene ID: 16432, updated on 12-Aug-2019

Summary

- Official Symbol** Itm2b provided by [MGI](#)
- Official Full Name** integral membrane protein 2B provided by [MGI](#)
- Primary source** [MGI:MGI:1309517](#)
- See related** [Ensembl:ENSMUSG00000022108](#)
- 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** Bri; Bri2; E25BMM; imBRI2; Bricd2b; D14Sel6; AI256040
- Expression** Broad expression in genital fat pad adult (RPKM 2218.4), kidney adult (RPKM 608.2) and 25 other tissues [See more](#)
- Orthologs** [human](#) [all](#)

Genomic context

Location: 14 D3; 14 38.88 cM See Itm2b in [Genome Data Viewer](#)

Exon count: 6

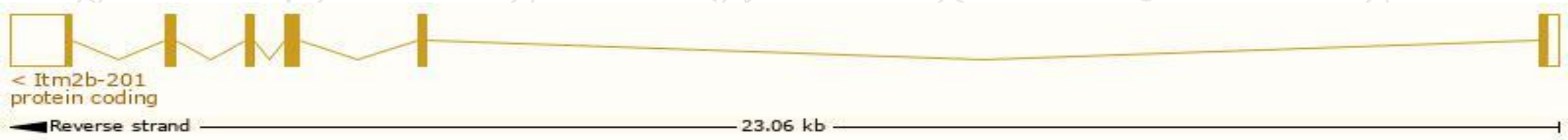
Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	14	NC_000080.6 (73362226..73385289, complement)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	14	NC_000080.5 (73762038..73785078, complement)

Transcript information (Ensembl)

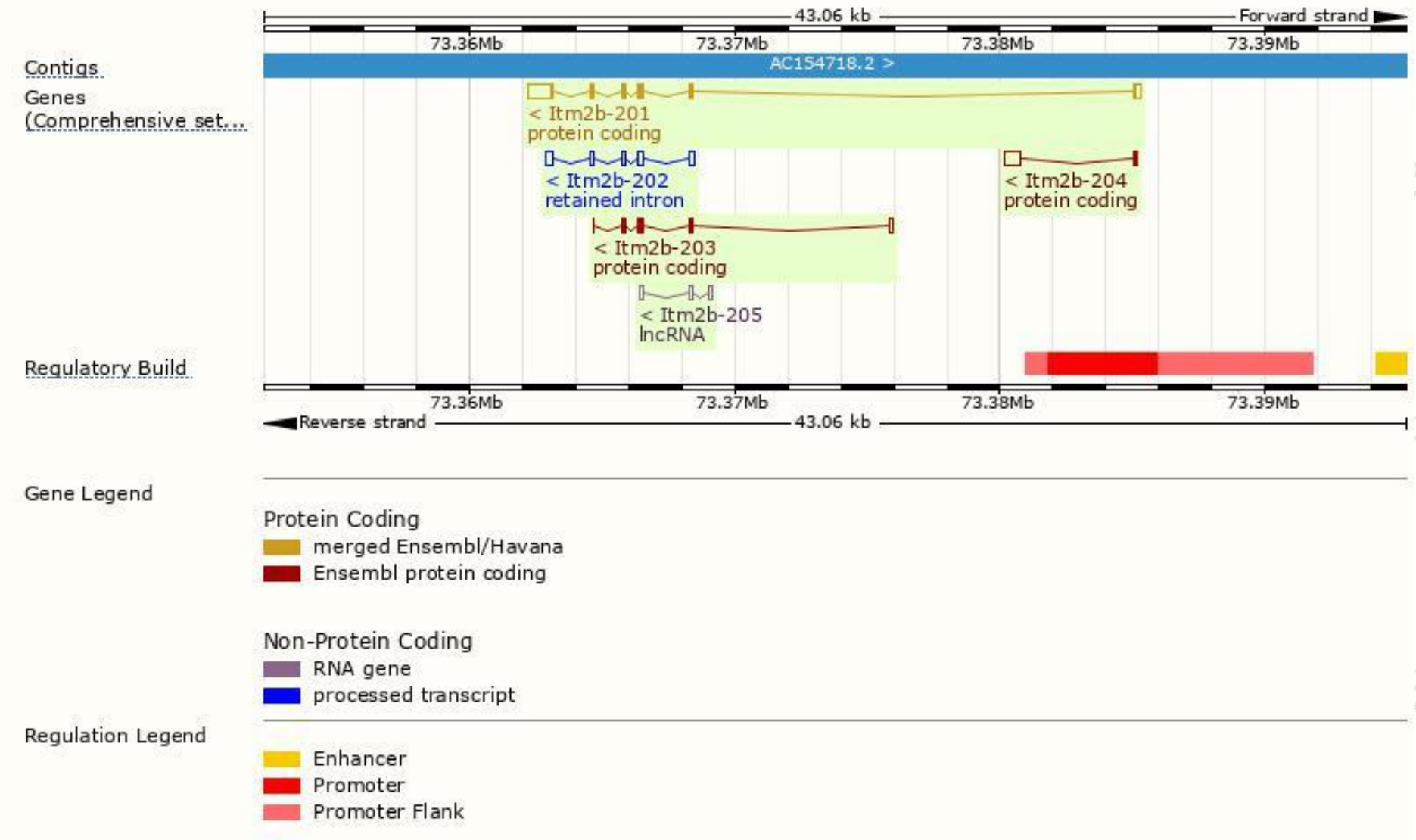
The gene has 5 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Itm2b-201	ENSMUST00000022704.8	1796	266aa	Protein coding	CCDS27269	O89051	TSL:1 GENCODE basic APPRIS P1
Itm2b-204	ENSMUST000000228637.1	783	40aa	Protein coding	-	A0A2I3BQ30	GENCODE basic
Itm2b-203	ENSMUST000000227454.1	625	144aa	Protein coding	-	A0A2I3BPW7	CDS 3' incomplete
Itm2b-202	ENSMUST000000226722.1	935	No protein	Retained intron	-	-	
Itm2b-205	ENSMUST000000228707.1	383	No protein	lncRNA	-	-	

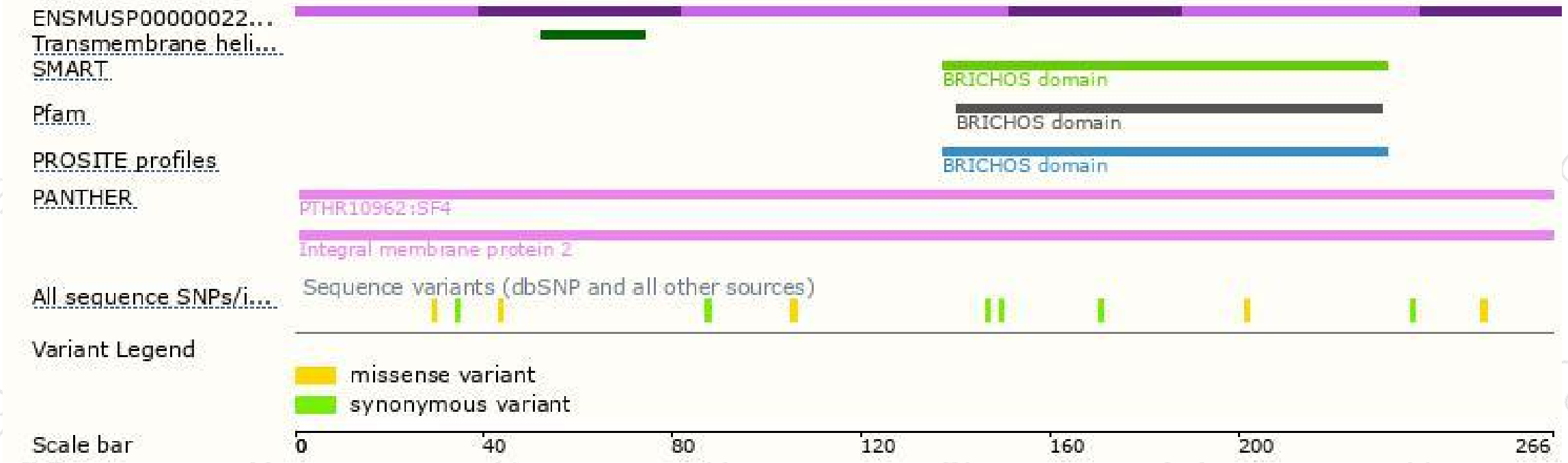
The strategy is based on the design of *Itm2b-201* transcript,The transcription is shown below



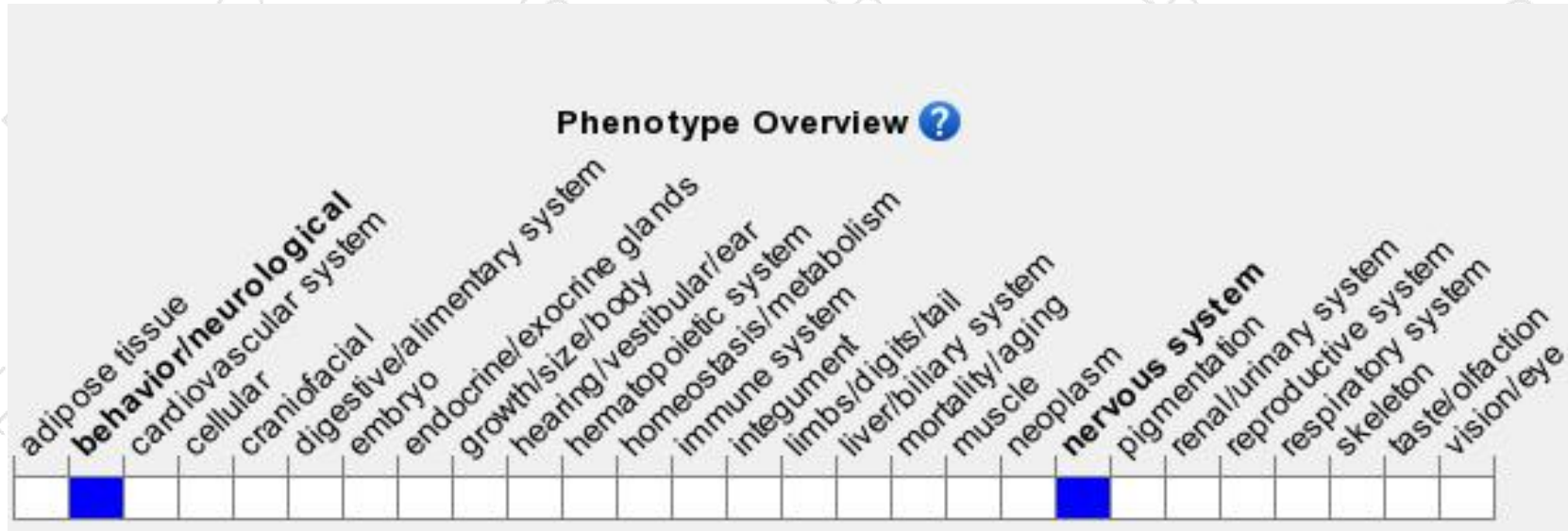
Genomic location distribution



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 null mutation display increased levels of soluble APP fragments in the brain. Mice homozygous for a knock-in allele exhibit impaired object recognition, impaired contextual conditioning, and impaired spatial working memory.

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

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