

# ***Btk Cas9-KO Strategy***

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Design Date: 2019-7-22

# Project Overview

**Project Name**

*Btk*

**Project type**

**Cas9-KO**

**Strain background**

**C57BL/6JGpt**

# Knockout strategy

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



- The *Btk* gene has 5 transcripts. According to the structure of *Btk* gene, exon3-exon5 of *Btk-201* (ENSMUST00000033617.12) transcript is recommended as the knockout region. The region contains 250bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Btk* gene. The brief process is as follows: CRISPR/Cas9 system will

- According to the existing MGI data, Mutants have immune defects including reduced B cell numbers, serum immunoglobulin deficiencies, and defective responses to B cell activators and thymus-independent antigens. B-1 B cells are absent in these mice.
- The *Btk* gene is located on the ChrX. 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)

## Btk Bruton agammaglobulinemia tyrosine kinase [Mus musculus (house mouse)]

Gene ID: 12229, updated on 31-Jan-2019

### Summary



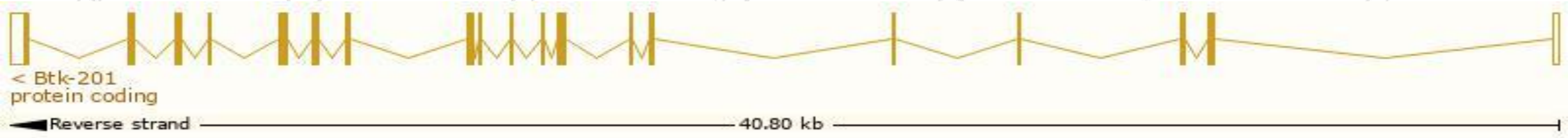
<b>Official Symbol</b>	Btk provided by <a href="#">MGI</a>
<b>Official Full Name</b>	Bruton agammaglobulinemia tyrosine kinase provided by <a href="#">MGI</a>
<b>Primary source</b>	<a href="#">MGI:MGI:88216</a>
<b>See related</b>	<a href="#">Ensembl:ENSMUSG00000031264</a>
<b>Gene type</b>	protein coding
<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>	AI528679, xid
<b>Expression</b>	Biased expression in liver E14 (RPKM 7.3), liver E14.5 (RPKM 5.9) and 11 other tissues <a href="#">See more</a>
<b>Orthologs</b>	<a href="#">human</a> <a href="#">all</a>

# Transcript information (Ensembl)

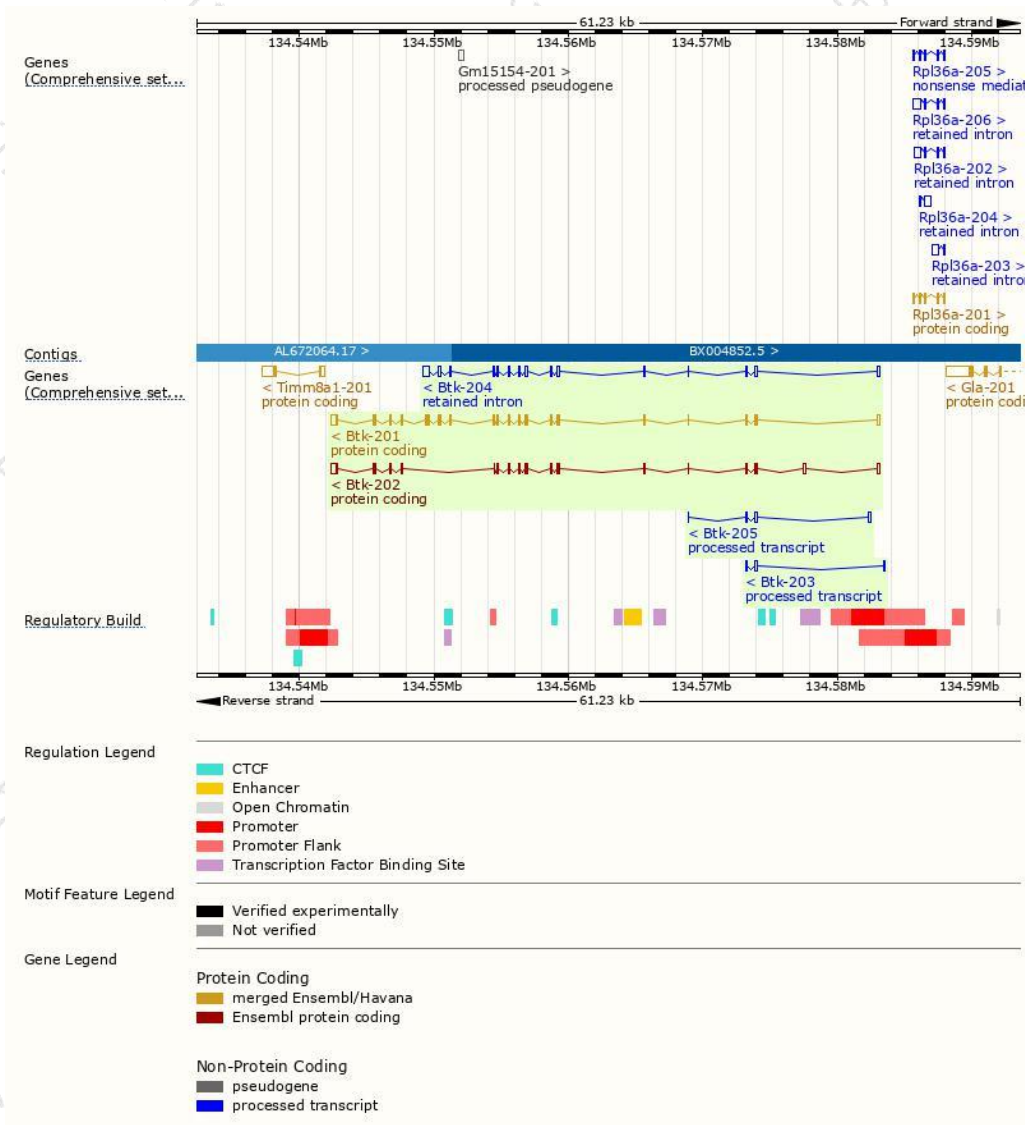
The gene has 5 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Btk-201	<a href="#">ENSMUST00000033617.12</a>	2540	<a href="#">659aa</a>	Protein coding	<a href="#">CCDS30396</a>	<a href="#">P35991</a>	TSL:1 GENCODE basic APPRIS P1
Btk-202	<a href="#">ENSMUST00000113213.1</a>	2121	<a href="#">483aa</a>	Protein coding	-	<a href="#">A2BDW0</a>	TSL:5 GENCODE basic
Btk-205	<a href="#">ENSMUST00000150245.7</a>	481	No protein	Processed transcript	-	-	TSL:2
Btk-203	<a href="#">ENSMUST00000128333.1</a>	388	No protein	Processed transcript	-	-	TSL:3
Btk-204	<a href="#">ENSMUST00000132664.7</a>	1920	No protein	Retained intron	-	-	TSL:5

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



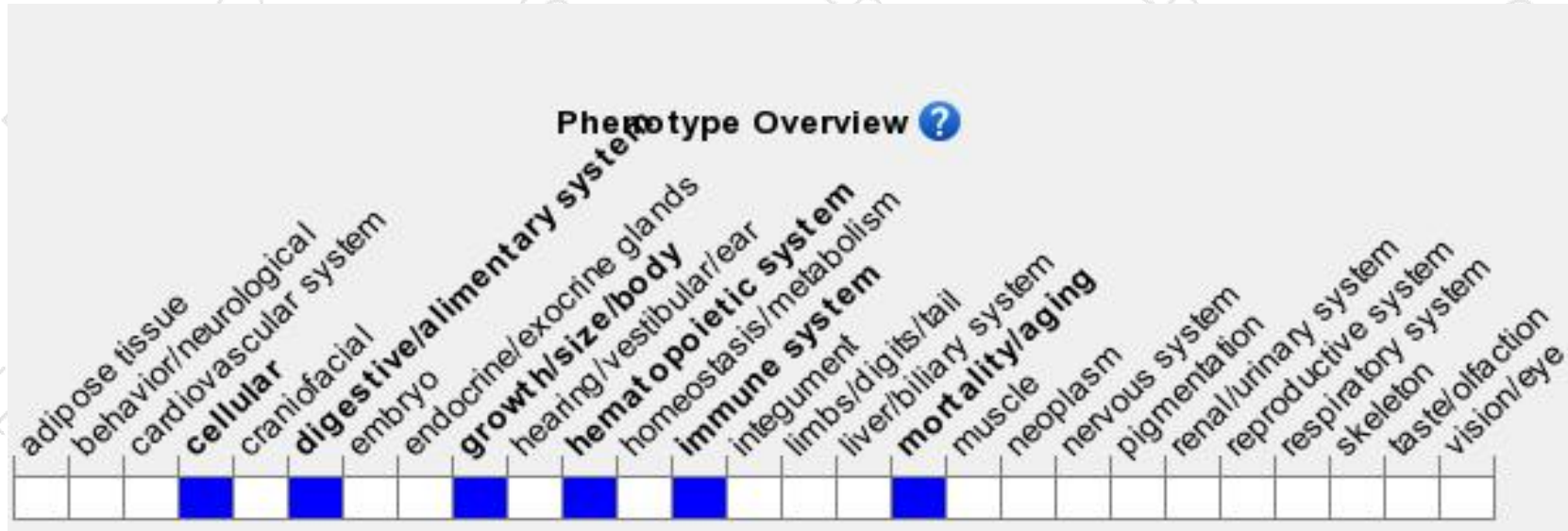
# Genomic location distribution



# 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, Mutants have immune defects including reduced B cell numbers, serum immunoglobulin deficiencies, and defective responses to B cell activators and thymus-independent antigens. B-1 B cells are absent in these mice.

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

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