

***Btg3* Cas9-CKO Strategy**

Designer: Xueting Zhang

Reviwer: Yanhua Shen

Date: 2020-02-13

Project Overview

Project Name

Btg3

Project type

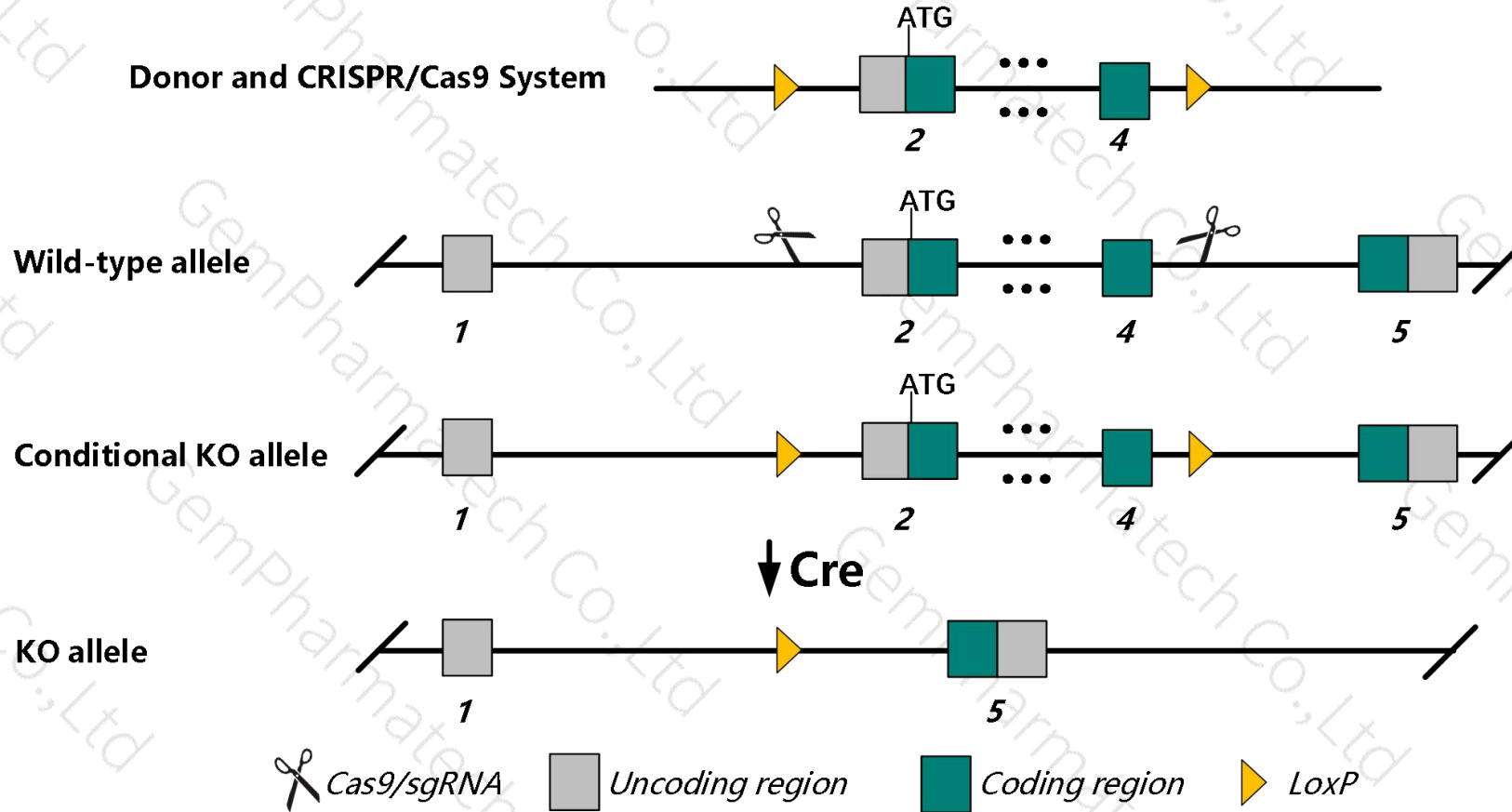
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Btg3* gene. The schematic diagram is as follows:



Technical routes

- The *Btg3* gene has 3 transcripts. According to the structure of *Btg3* gene, exon2-exon4 of *Btg3-201* (ENSMUST00000023570.13) transcript is recommended as the knockout region. The region contains start codon ATG. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Btg3* gene. The brief process is as follows: CRISPR/Cas9 system 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 will be knocked out after mating with mice expressing Cre recombinase, resulting in the loss of function of the target gene in specific tissues and cell types.

- According to the existing MGI data, Mice homozygous for a knock-out allele exhibit increased incidence of lung tumors.
- The effect on transcript *Btg3*-202&203 is unknown.
- The *Btg3* gene is located on the Chr16. 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at existing technological level.

Gene information (NCBI)



Btg3 BTG anti-proliferation factor 3 [*Mus musculus* (house mouse)]

Gene ID: 12228, updated on 5-Jan-2020

Summary

Official Symbol

Btg3 provided by MGI

Official Full Name

BTG anti-proliferation factor 3 provided by MGI

Primary source

MGI:MGI:109532

See related

Ensembl:ENSMUSG00000022863

Gene type

protein coding

RefSeq status

REVIEWED

Organism

Mus musculus

Lineage

Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus

Also known as

ANA; tob5

Summary

This gene encodes B cell translocation gene 3, a member of the BTG gene family. This family is defined by a conserved N-terminal domain, known to bind transcription factors, and a less conserved C-terminal domain. This protein is thought to have anti-proliferative properties, and may be involved in regulating the G1-S transition to suppress cell cycle progression. Mice deficient for this gene display an increased incidence of lung cancers, and many human lung cancer cells exhibit decreased levels of B cell translocation gene 3. Alternate splicing results in multiple transcript variants. A pseudogene of this gene is found on chromosome 17. [provided by RefSeq, Jul 2014]

Expression

Broad expression in genital fat pad adult (RPKM 36.7), placenta adult (RPKM 14.6) and 20 other tissues See more

Orthologs

human all

Genomic context

Location: 16; 16 C3.1

Exon count: 6

See Btg3 in [Genome Data Viewer](#)

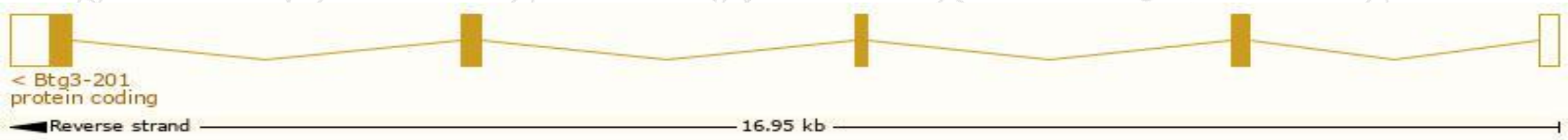
Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	16	NC_000082.6 (78359860..78377181, complement)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	16	NC_000082.5 (78360105..78377030, complement)

Transcript information (Ensembl)

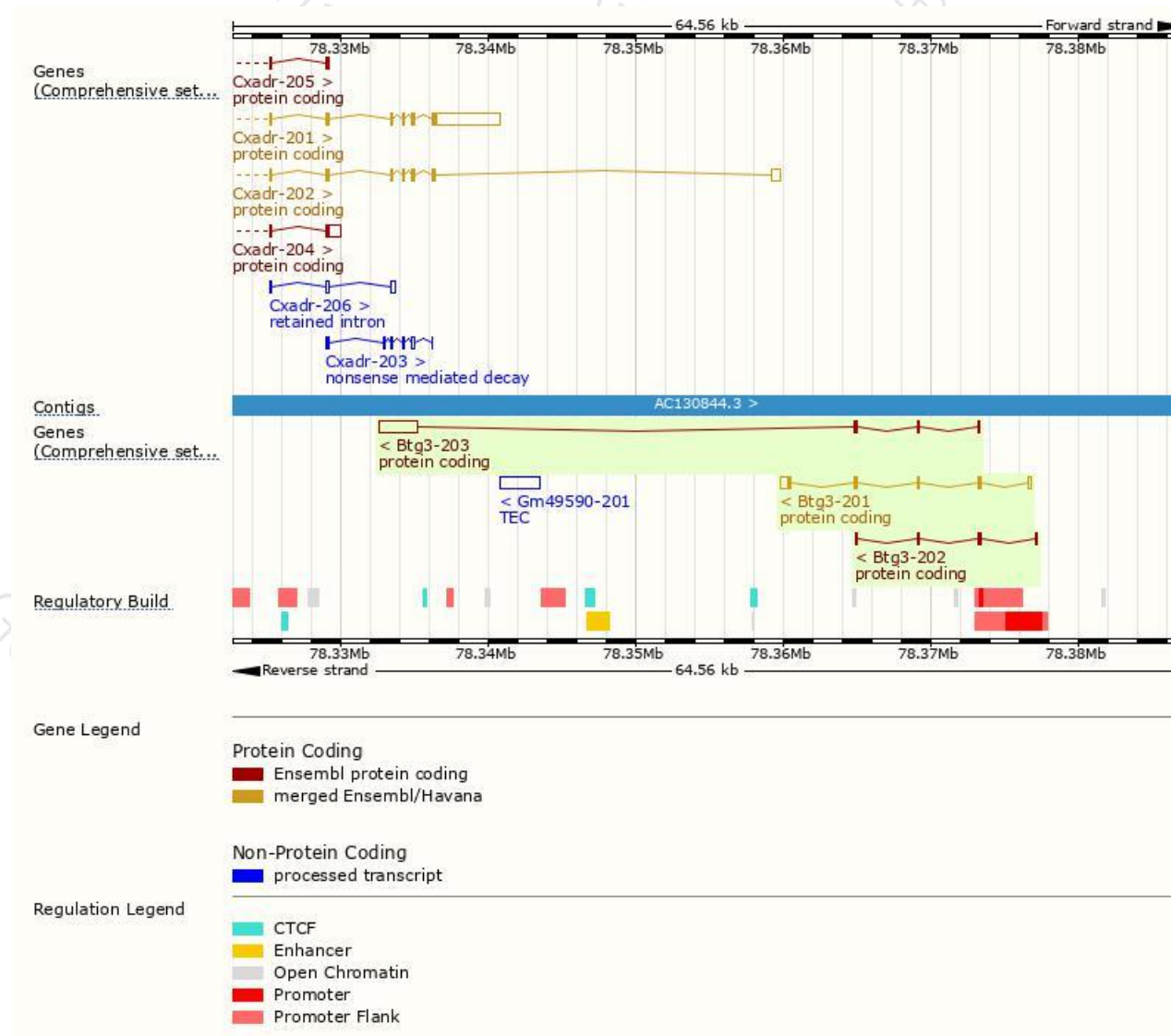
The gene has 3 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Btg3-201	ENSMUST00000023570.13	1414	252aa	Protein coding	CCDS28277	P50615 Q52L83	TSL:1 GENCODE basic APPRIS P1
Btg3-203	ENSMUST00000231353.1	3013	152aa	Protein coding	-	A0A338P787	CDS 5' incomplete
Btg3-202	ENSMUST00000148124.1	442	137aa	Protein coding	-	D3Z1M9	CDS 3' incomplete TSL:5

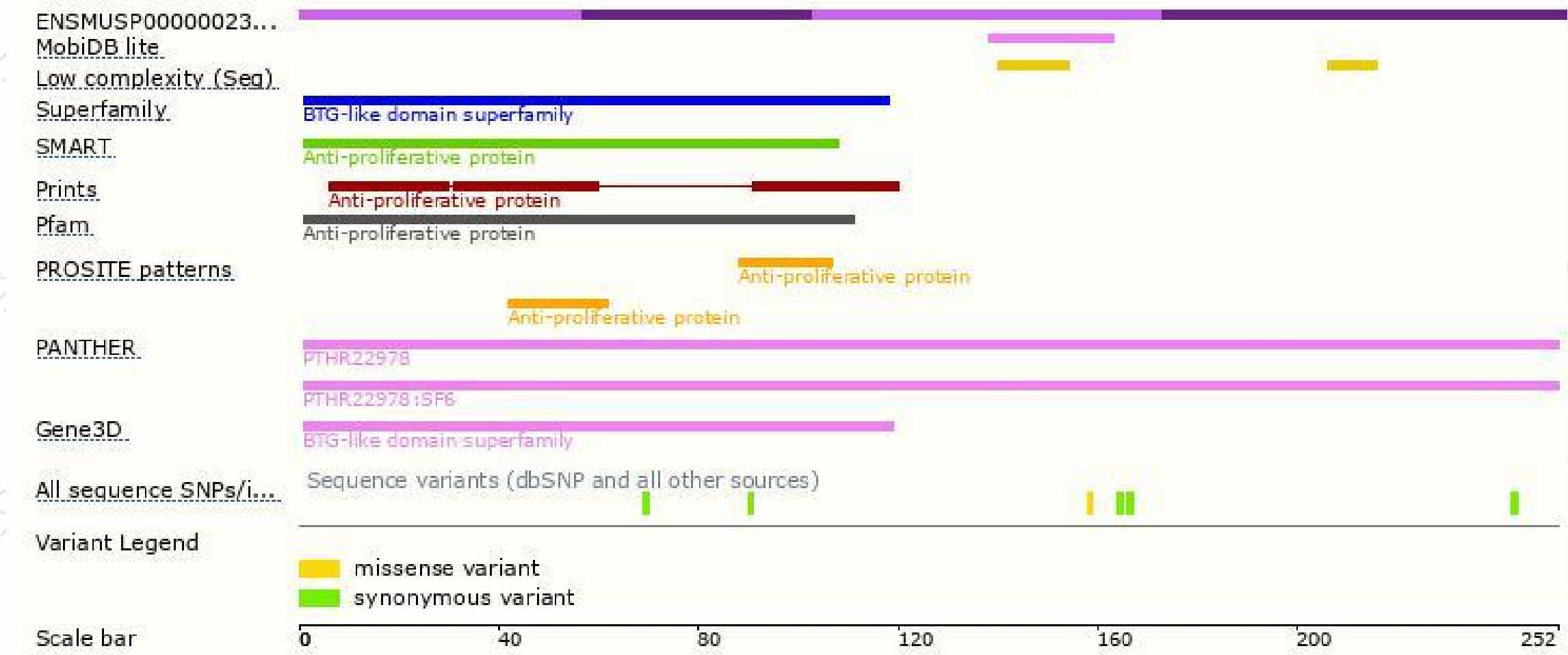
The strategy is based on the design of *Btg3-201* transcript,The transcription is shown below



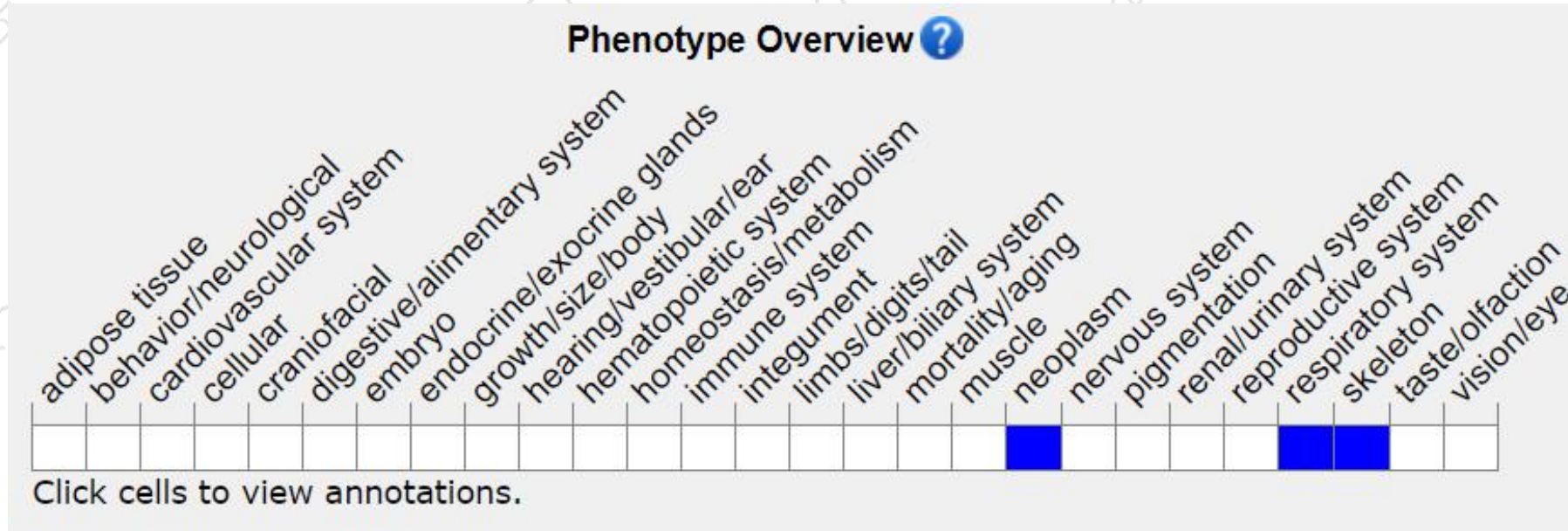
Genomic location distribution



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 increased incidence of lung tumors.

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

Tel: 400-9660890

