

***Map3k7* Cas9-KO Strategy**

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Reviewer: Yanhua Shen

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Project Overview

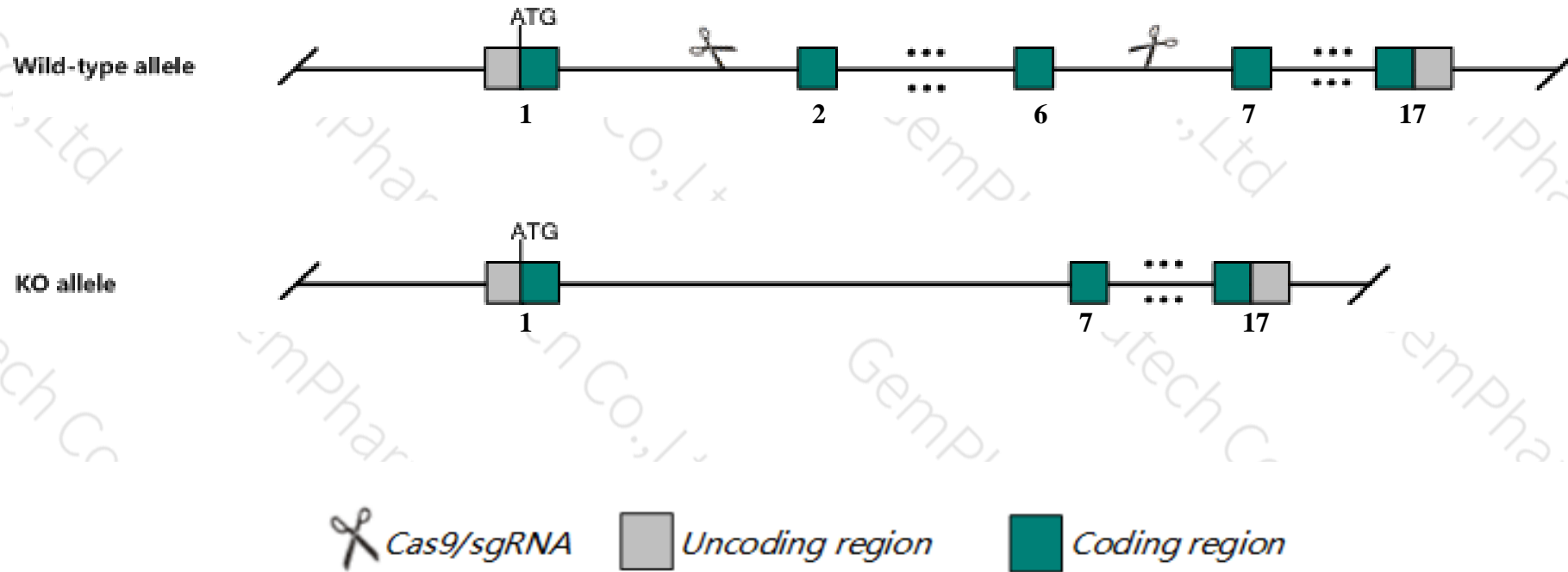
Project Name	<i>Map3k7</i>
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Project type	Cas9-KO
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Strain background	C57BL/6J
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Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Map3k7* gene. The schematic diagram is as follows:



- The *Map3k7* gene has 9 transcripts. According to the structure of *Map3k7* gene, exon2-exon6 of *Map3k7-201* (ENSMUST00000037607.10) transcript is recommended as the knockout region. The region contains 487bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Map3k7* gene. The brief process is as follows: sgRNA was transcribed in vitro. Cas9 and sgRNA were microinjected into the fertilized eggs of C57BL/6J 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/6J mice.

- According to the existing MGI data, Homozygous null mice display embryonic lethality during organogenesis and may have impaired vascular remodeling, edema, or an open, wavy neural tube. Mice with conditional deletion in immune cells show impaired cell development and activation.
- Transcript *Map3k7-207&209* may be not affected.
- The *Map3k7* gene is located on the Chr4. 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)

Map3k7 mitogen-activated protein kinase kinase kinase 7 [Mus musculus (house mouse)]

Gene ID: 26409, updated on 9-Apr-2019

Summary



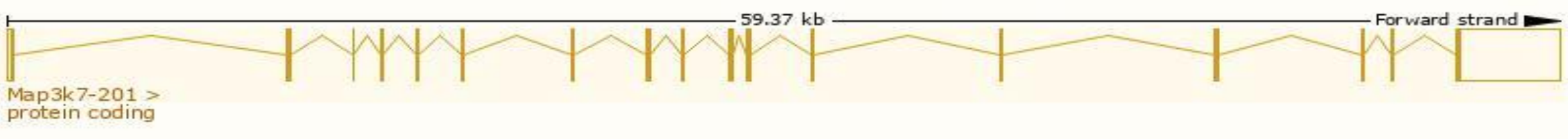
Official Symbol	Map3k7 provided by MGI
Official Full Name	mitogen-activated protein kinase kinase kinase 7 provided by MGI
Primary source	MGI:MGI:1346877
See related	Ensembl:ENSMUSG00000028284
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	B430101B05, C87327, Tak1
Expression	Ubiquitous expression in CNS E11.5 (RPKM 14.7), limb E14.5 (RPKM 14.0) and 28 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

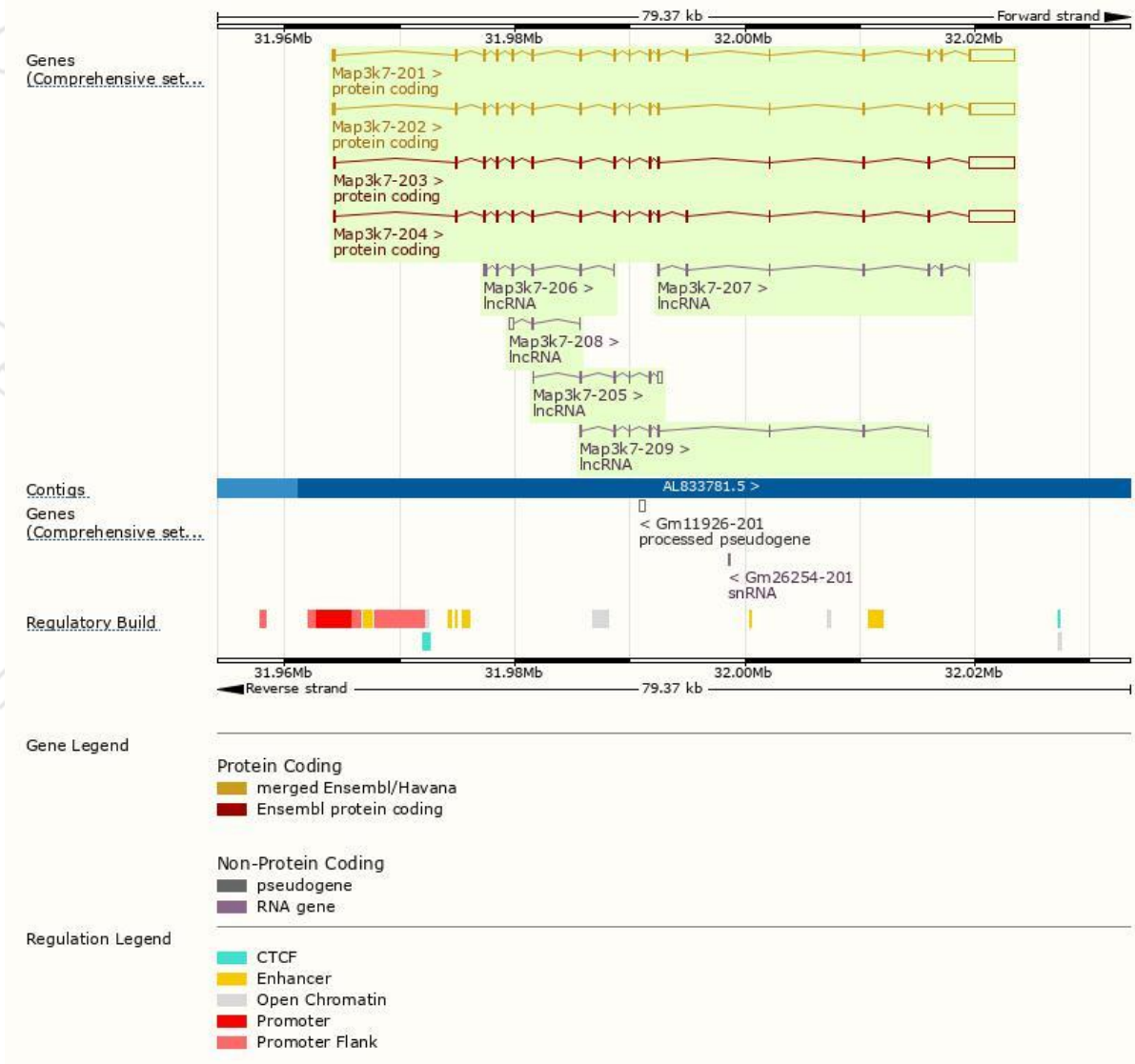
The gene has 9 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Map3k7-201	ENSMUST00000037607.10	5773	606aa	Protein coding	CCDS51133	Q923A8	TSL:1 GENCODE basic APPRIS ALT1
Map3k7-202	ENSMUST00000080933.12	5669	579aa	Protein coding	CCDS18014	Q543B5 Q62073	TSL:1 GENCODE basic APPRIS P3
Map3k7-204	ENSMUST00000108184.2	5491	518aa	Protein coding	-	A2AP92	TSL:5 GENCODE basic
Map3k7-203	ENSMUST00000108183.7	5416	491aa	Protein coding	-	A2AP93	TSL:5 GENCODE basic
Map3k7-205	ENSMUST00000126632.7	865	No protein	lncRNA	-	-	TSL:5
Map3k7-209	ENSMUST00000147462.7	821	No protein	lncRNA	-	-	TSL:5
Map3k7-206	ENSMUST00000131114.7	612	No protein	lncRNA	-	-	TSL:3
Map3k7-207	ENSMUST00000131310.1	590	No protein	lncRNA	-	-	TSL:3
Map3k7-208	ENSMUST00000143138.1	538	No protein	lncRNA	-	-	TSL:3

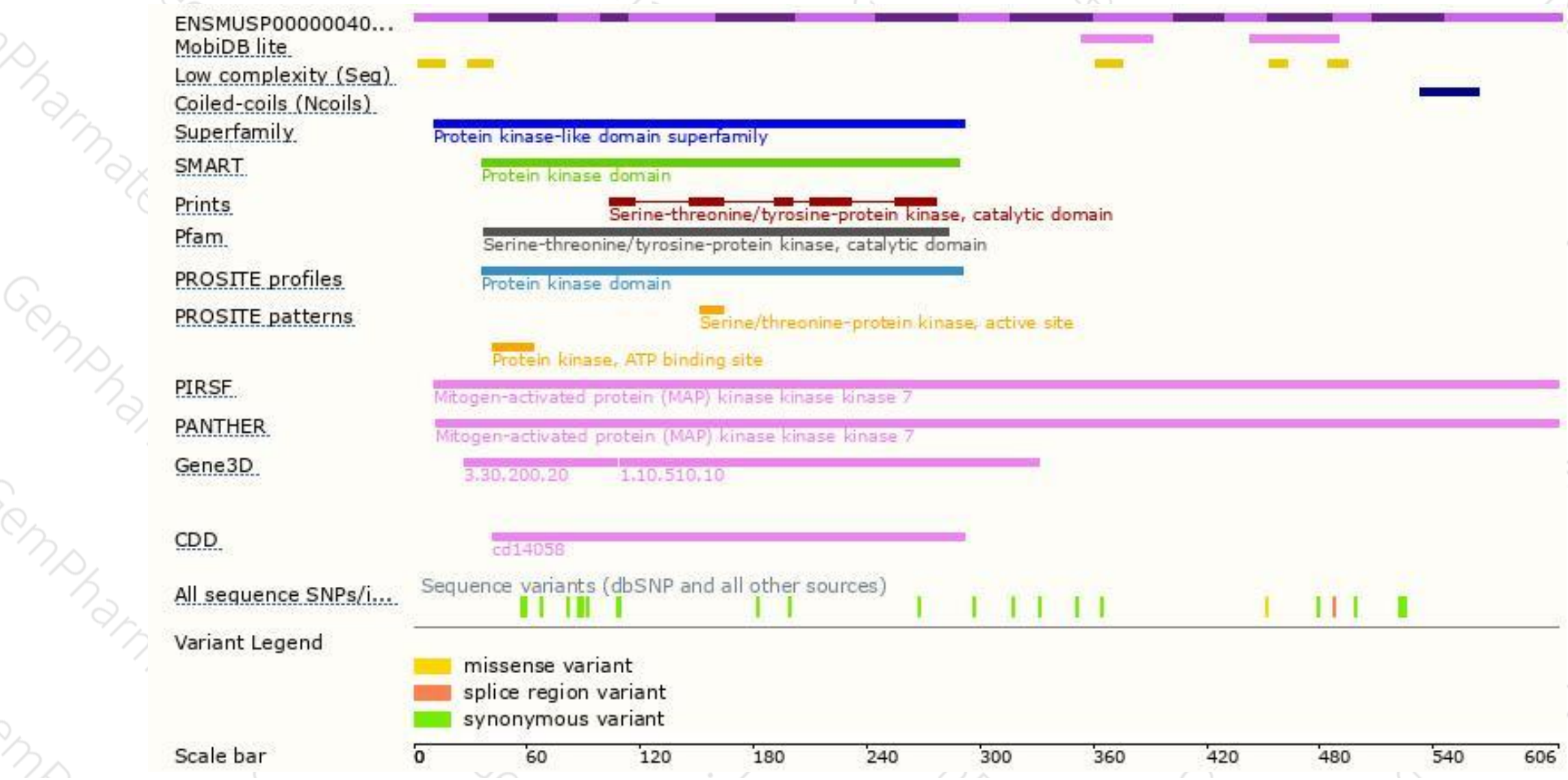
The strategy is based on the design of *Map3k7-201* transcript,The transcription is shown below



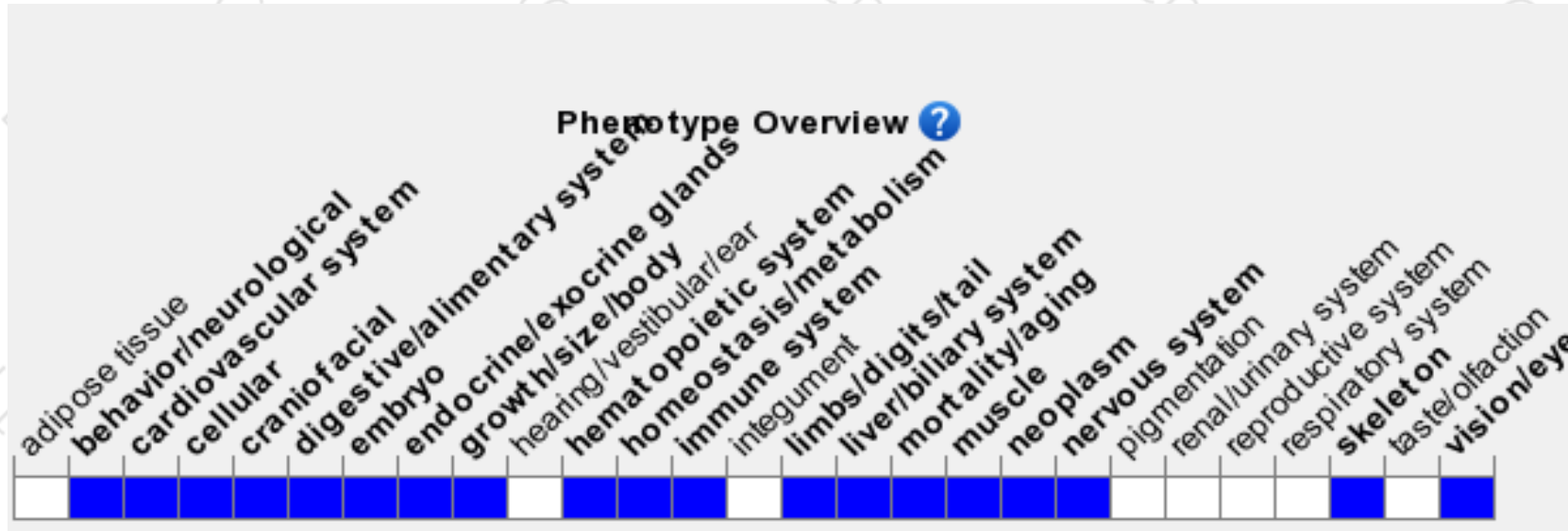
Genomic location distribution



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, Homozygous null mice display embryonic lethality during organogenesis and may have impaired vascular remodeling, edema, or an open, wavy neural tube. Mice with conditional deletion in immune cells show impaired cell development and activation.

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

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