

# *Cdk6* Cas9-CKO Strategy

**Designer:**

**Jinling Wang**

**Design Date:**

**2019-7-17**

# Project Overview

**Project Name**

***Cdk6***

**Project type**

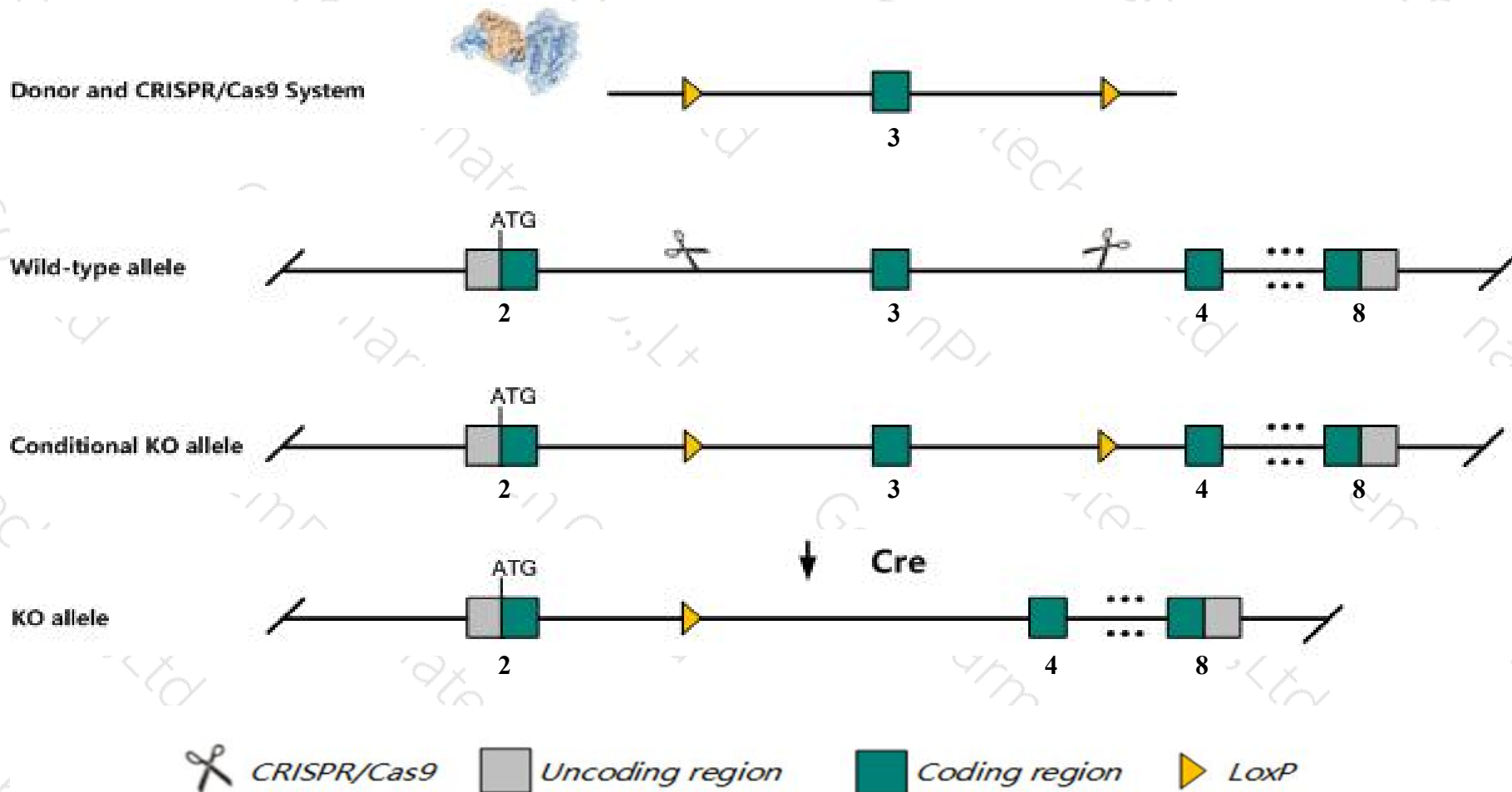
**Cas9-CKO**

**Strain background**

**C57BL/6JGpt**

# Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Cdk6* gene. The schematic diagram is as follows:



- The *Cdk6* gene has 6 transcripts. According to the structure of *Cdk6* gene, exon3 of *Cdk6-202* (ENSMUST00000165117.7) transcript is recommended as the knockout region. The region contains 136bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Cdk6* 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 disruptions in this gene display hematopoietic abnormalities affecting spleen and thymus size. Female body weight and fertility are also reduced.
- The *Cdk6* gene is located on the Chr5. 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)

## Cdk6 cyclin-dependent kinase 6 [Mus musculus (house mouse)]

Gene ID: 12571, updated on 31-Jan-2019

### Summary



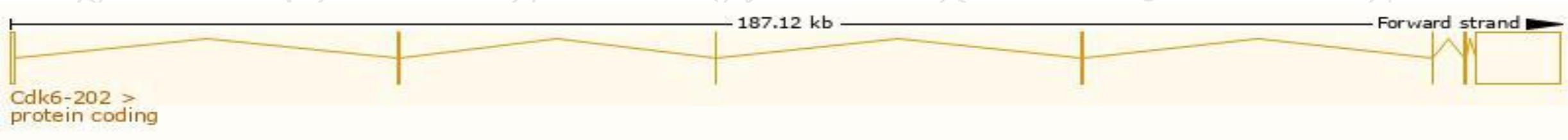
<b>Official Symbol</b>	Cdk6 provided by <a href="#">MGI</a>
<b>Official Full Name</b>	cyclin-dependent kinase 6 provided by <a href="#">MGI</a>
<b>Primary source</b>	<a href="#">MGI:MGI:1277162</a>
<b>See related</b>	<a href="#">Ensembl:ENSMUSG00000040274</a>
<b>Gene type</b>	protein coding
<b>RefSeq status</b>	REVIEWED
<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>	AI504062, Crk2
<b>Summary</b>	This gene encodes a member of the cyclin dependent kinase family of proteins that play important roles in the progression and regulation of the cell cycle. The encoded protein binds to a D-type cyclin to form an active kinase complex to regulate progression through the G1 phase of the cell cycle. Mice lacking the encoded protein exhibit thymic and splenic hypoplasia, and hematopoietic defects such as reduced number of megakaryocytes and erythrocytes. A pseudogene of this gene has been defined on chromosome 4. [provided by RefSeq, Aug 2015]
<b>Expression</b>	Ubiquitous expression in thymus adult (RPKM 7.0), lung adult (RPKM 3.6) and 26 other tissues <a href="#">See more</a>
<b>Orthologs</b>	<a href="#">human</a> <a href="#">all</a>

# Transcript information (Ensembl)

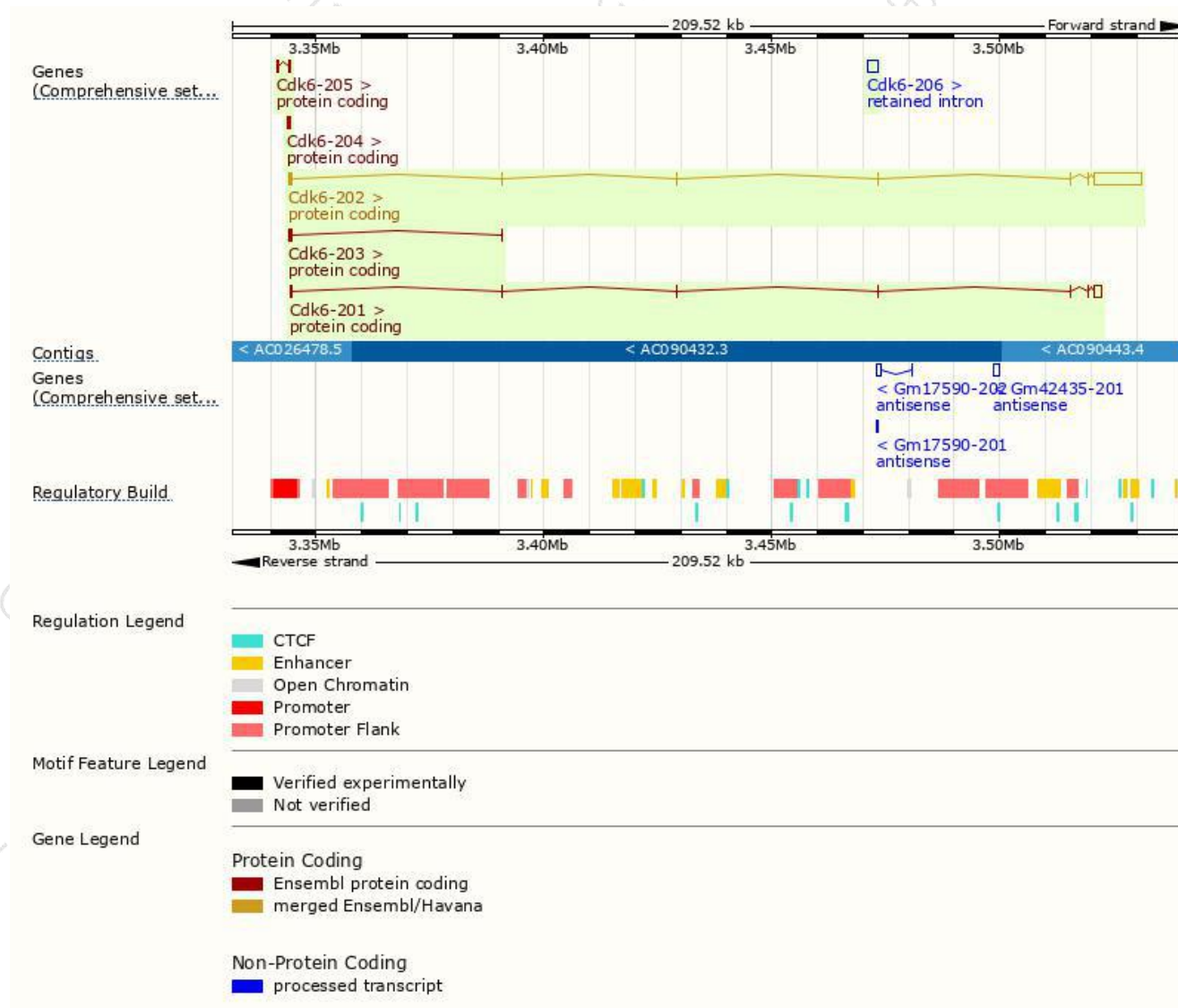
The gene has 6 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Cdk6-202	<a href="#">ENSMUST00000165117.7</a>	11525	<a href="#">326aa</a>	Protein coding	<a href="#">CCDS19062</a>	<a href="#">Q0VBK8 Q64261</a>	TSL:1 GENCODE basic APPRIS P1
Cdk6-201	<a href="#">ENSMUST00000042410.4</a>	2470	<a href="#">326aa</a>	Protein coding	<a href="#">CCDS19062</a>	<a href="#">Q0VBK8 Q64261</a>	TSL:1 GENCODE basic APPRIS P1
Cdk6-203	<a href="#">ENSMUST00000197385.1</a>	697	<a href="#">82aa</a>	Protein coding	-	<a href="#">A0A0G2JGA8</a>	CDS 3' incomplete TSL:2
Cdk6-205	<a href="#">ENSMUST00000199156.1</a>	425	<a href="#">29aa</a>	Protein coding	-	<a href="#">A0A0G2JGH2</a>	CDS 3' incomplete TSL:5
Cdk6-204	<a href="#">ENSMUST00000197607.1</a>	376	<a href="#">23aa</a>	Protein coding	-	<a href="#">A0A0G2JEJ6</a>	CDS 3' incomplete TSL:3
Cdk6-206	<a href="#">ENSMUST00000199396.1</a>	2232	No protein	Retained intron	-	-	TSL:NA

The strategy is based on the design of *Cdk6-202* transcript,The transcription is shown below

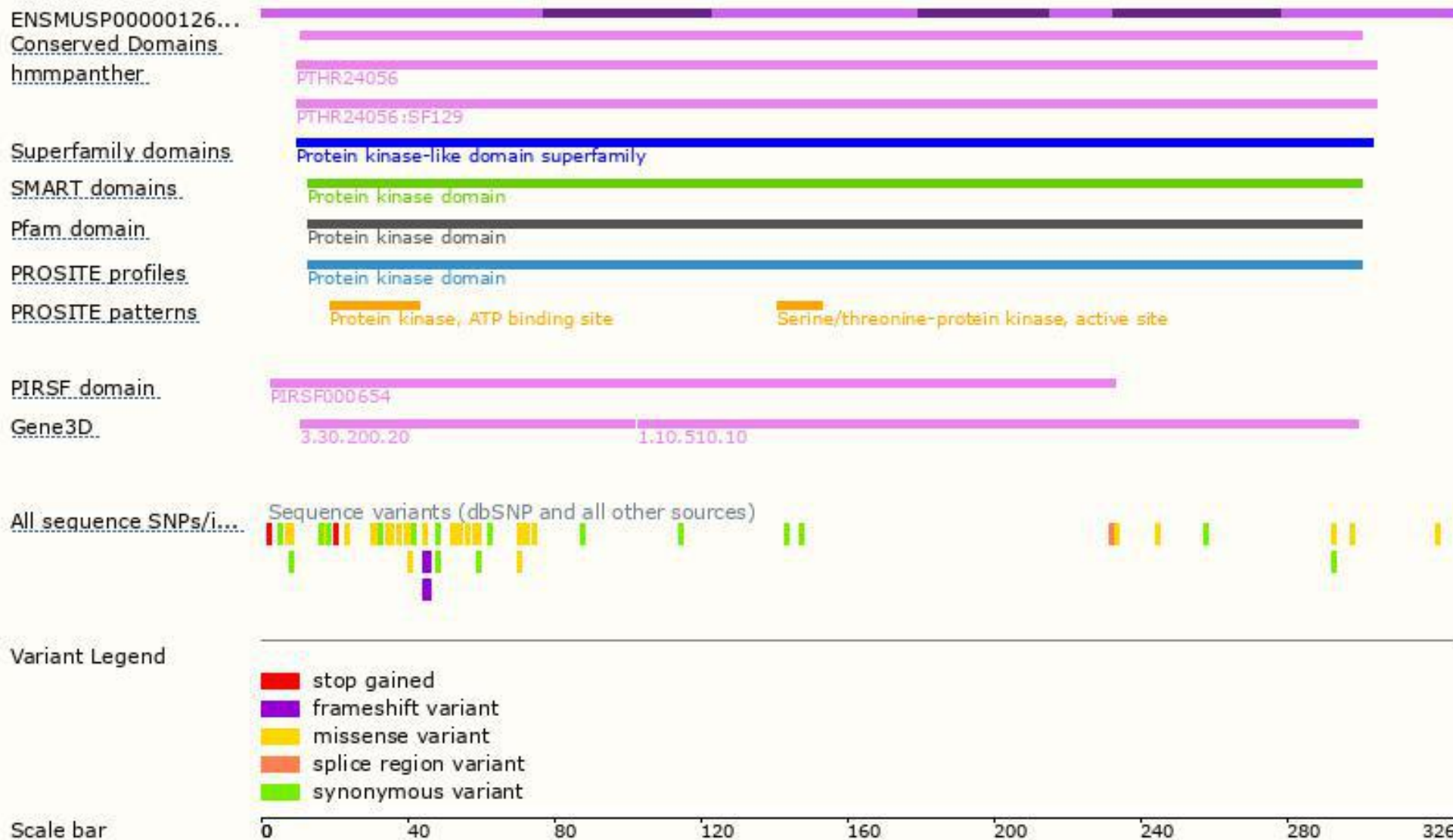


# Genomic location distribution

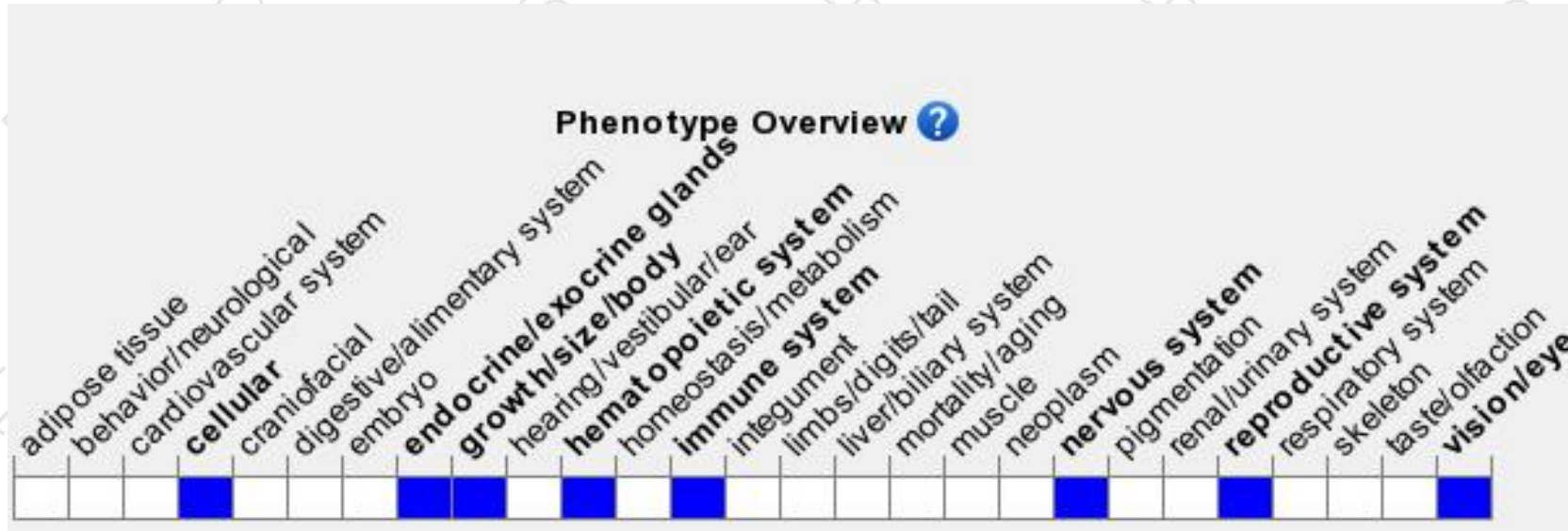




# Protein domain



# 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 disruptions in this gene display hematopoietic abnormalities affecting spleen and thymus size. Female body weight and fertility are also reduced.

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

Tel: 400-9660890

