

# *Ears2* Cas9-CKO Strategy

**Designer: Jinlong Zhao**

**Reviewer: Shilei Zhu**

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# Project Overview

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**Project Name**

*Ears2*

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**Project type**

**Cas9-CKO**

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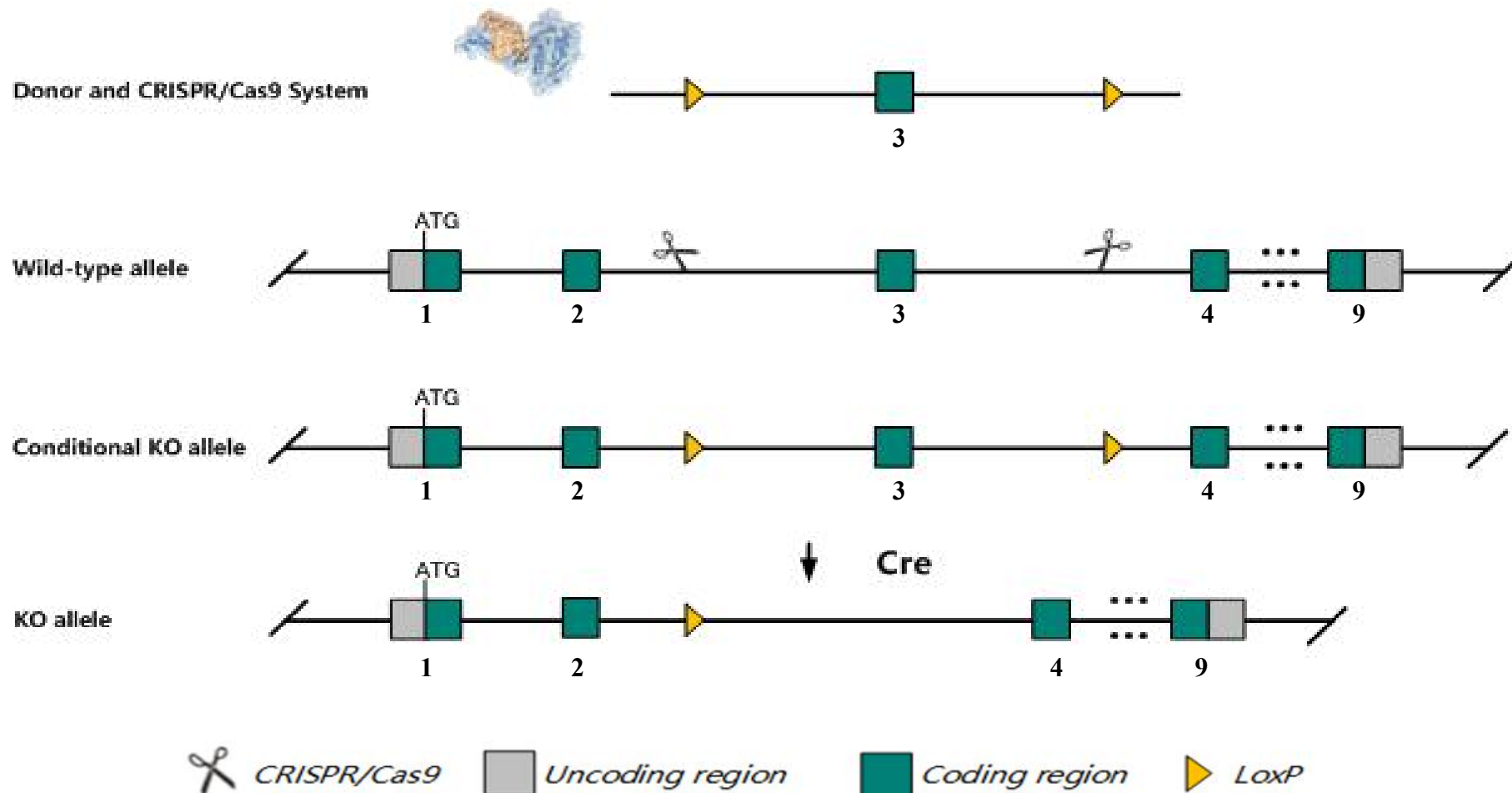
**Strain background**

**C57BL/6J**

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# Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Ears2* gene. The schematic diagram is as follows:



The *Ears2* gene has 3 transcripts. According to the structure of *Ears2* gene, exon3 of *Ears2-201* (ENSMUST00000033159.3) transcript is recommended as the knockout region. The region contains 190bp coding sequence. Knock out the region will result in disruption of protein function.

In this project we use CRISPR/Cas9 technology to modify *Ears2* gene. The brief process is as follows: CRISPR/Cas9 system and Donor 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.

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.

The *Ears2* gene is located on the Chr7. 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.

**Ears2 glutamyl-tRNA synthetase 2, mitochondrial [Mus musculus (house mouse)]**

Gene ID: 67417, updated on 31-Jan-2019

**Summary**

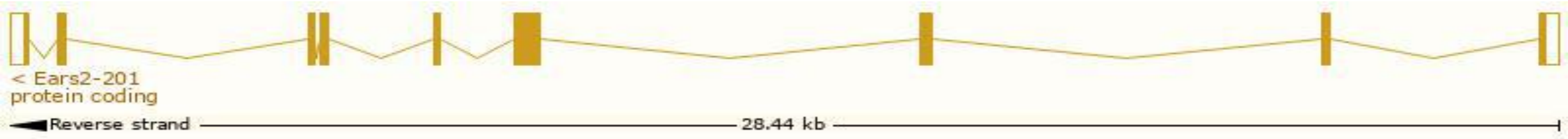
<b>Official Symbol</b>	Ears2 <small>provided by MGI</small>
<b>Official Full Name</b>	glutamyl-tRNA synthetase 2, mitochondrial <small>provided by MGI</small>
<b>Primary source</b>	<a href="#">MGI:MGI:1914667</a>
<b>See related</b>	<a href="#">Ensembl:ENSMUSG00000030871</a>
<b>Gene type</b>	protein coding
<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>	3230401I01Rik, mKIAA1970
<b>Summary</b>	This gene encodes a putative member of the class I family of aminoacyl-tRNA synthetases. These enzymes play a critical role in protein biosynthesis by charging tRNAs with their cognate amino acids. This protein is encoded by the nuclear genome but is likely to be imported to the mitochondrion where it is thought to catalyze the ligation of glutamate to tRNA molecules. Mutations in a similar gene in human have been associated with combined oxidative phosphorylation deficiency 12 (COXPD12). [provided by RefSeq, Mar 2015]
<b>Expression</b>	Ubiquitous expression in adrenal adult (RPKM 4.5), ovary adult (RPKM 3.9) and 28 other tissues <a href="#">See more</a>
<b>Orthologs</b>	<a href="#">human</a> <a href="#">all</a>

# Transcript information      Ensembl

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

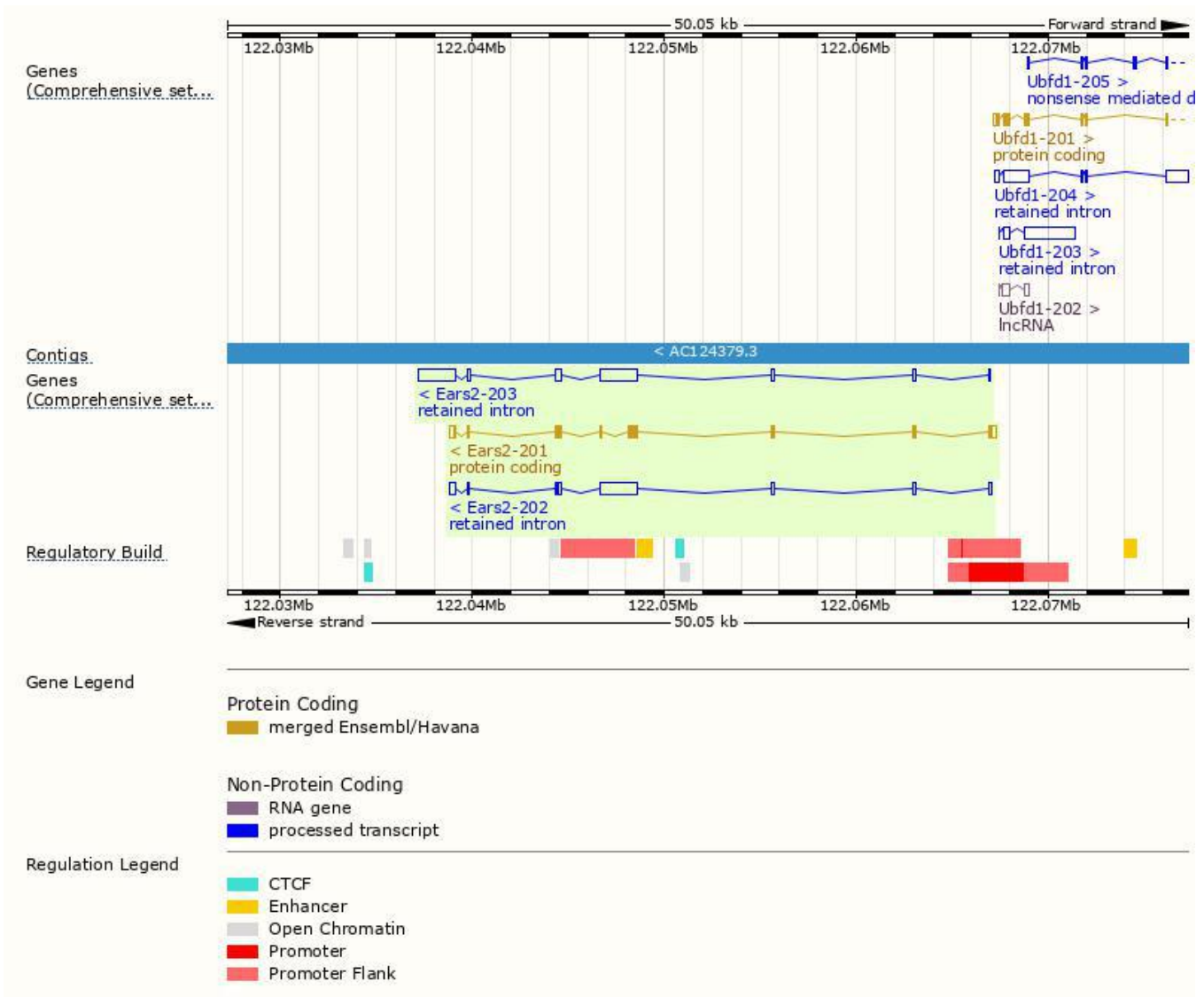
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Ears2-201	<a href="#">ENSMUST00000033159.3</a>	2046	<a href="#">523aa</a>	Protein coding	<a href="#">CCDS21807</a>	<a href="#">Q9CXJ1</a>	TSL:1 GENCODE basic APPRIS P1
Ears2-203	<a href="#">ENSMUST00000151530.7</a>	4900	No protein	Retained intron	-	-	TSL:2
Ears2-202	<a href="#">ENSMUST00000147397.1</a>	3222	No protein	Retained intron	-	-	TSL:2

The strategy is based on the design of *Ears2-201* transcript,The transcription is shown below



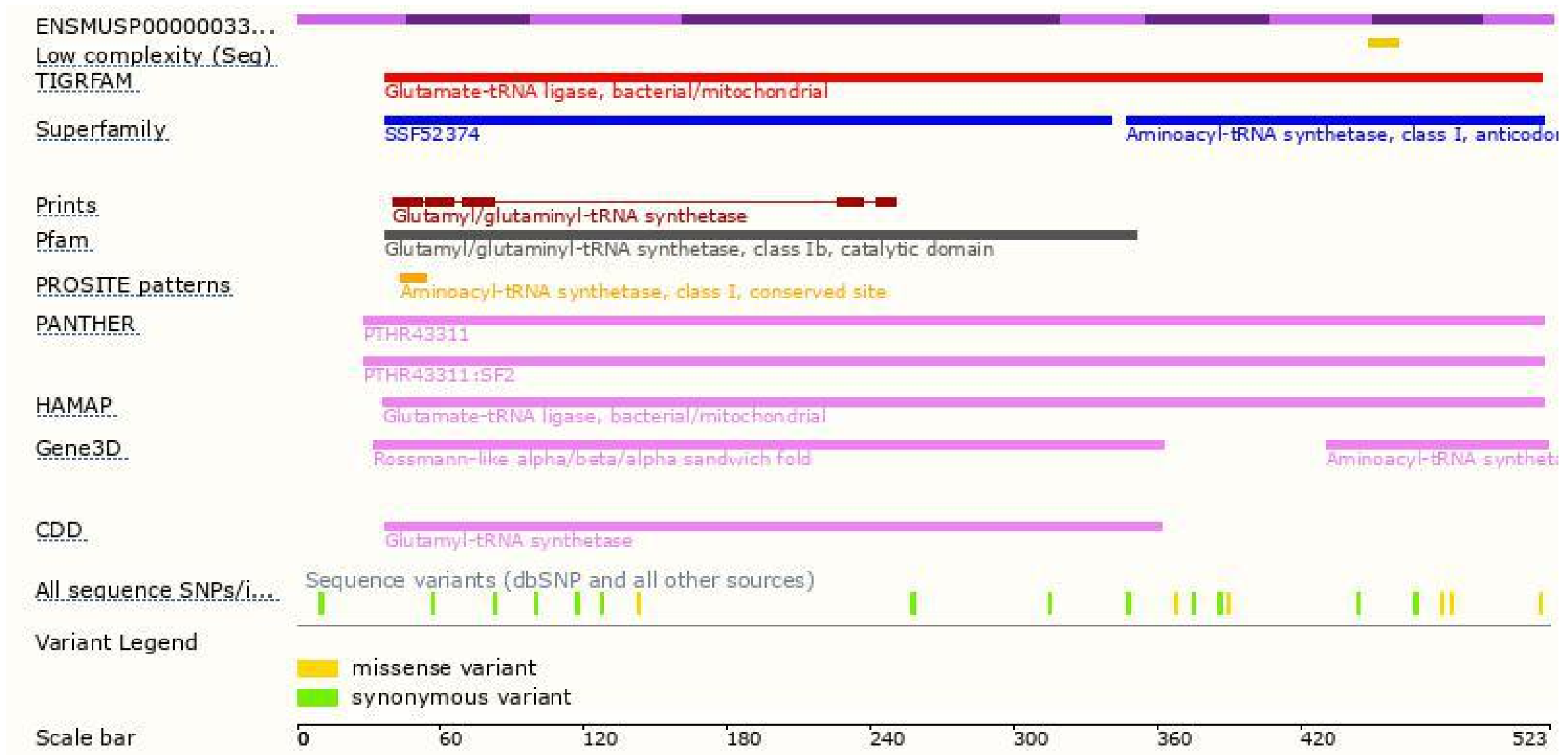


# Genomic location distribution

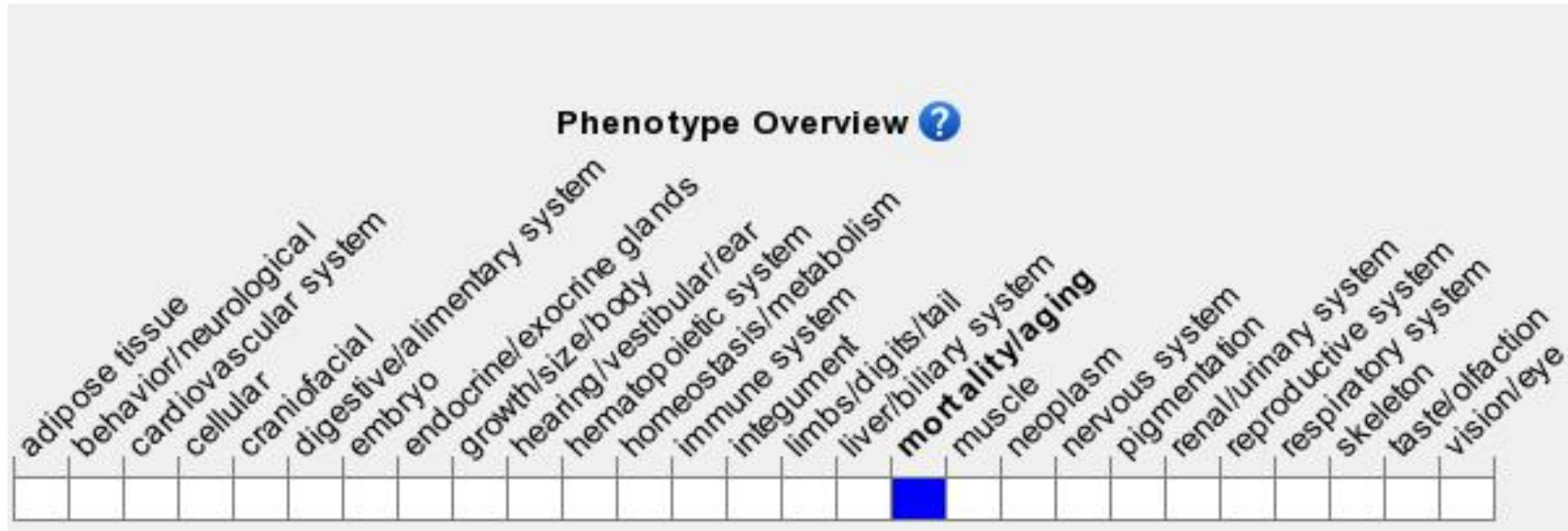




# Protein domain



# Mouse phenotype description(MGI )



*Phenotypes affected by the gene are marked in blue. Data quoted from MGI database(<http://www.informatics.jax.org/>).*

If you have any questions, you are welcome to inquire.  
Tel: 400-9660890

