

# *Chrna7* Cas9-CKO Strategy

**Designer:**

**Daohua Xu**

**Reviewer:**

**Huimin Su**

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# Project Overview

**Project Name**

***Chrna7***

**Project type**

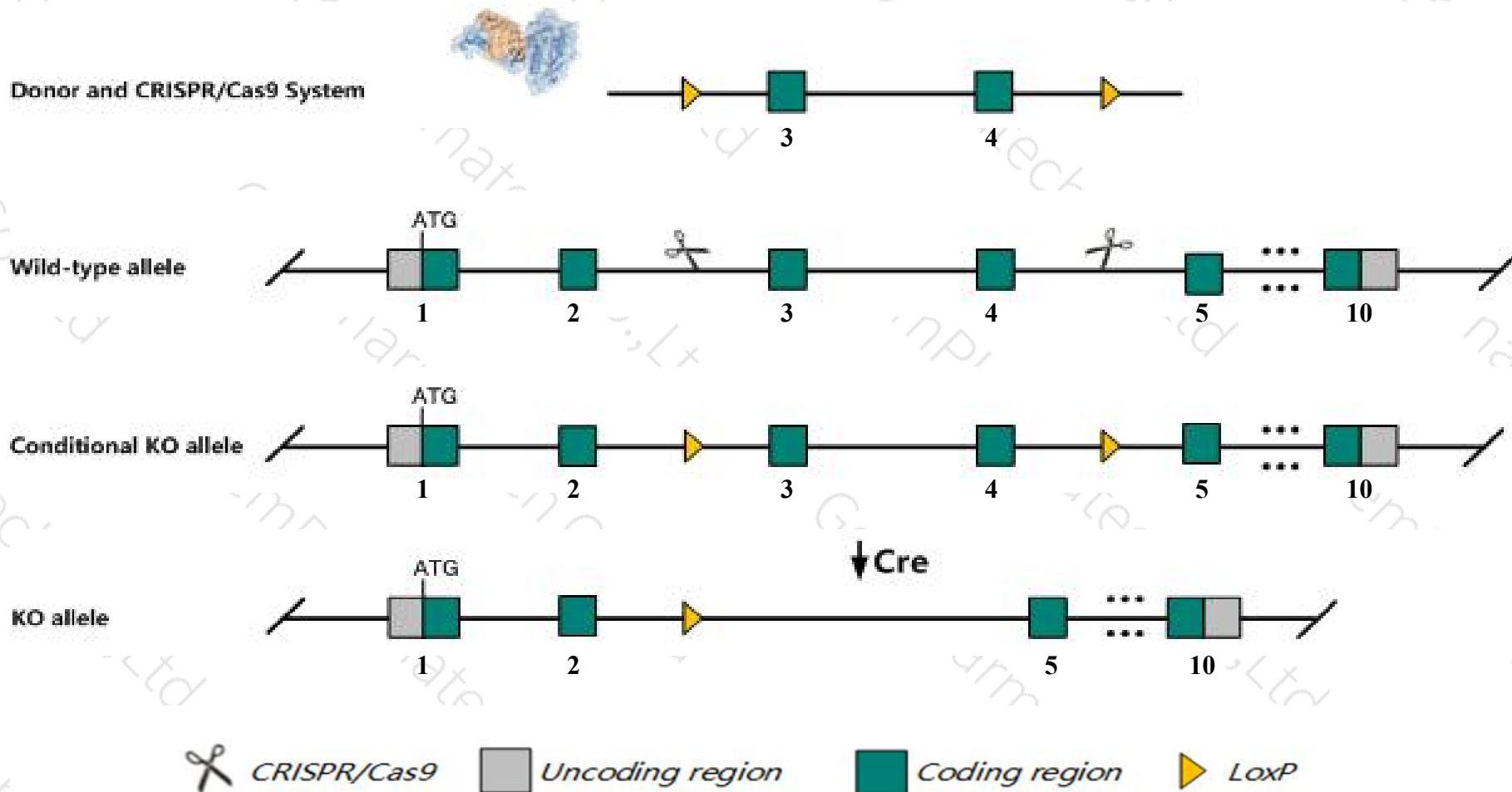
**Cas9-CKO**

**Strain background**

**C57BL/6JGpt**

# Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Chrna7* gene. The schematic diagram is as follows:



- The *Chrna7* gene has 2 transcripts. According to the structure of *Chrna7* gene, exon3-exon4 of *Chrna7-201* (ENSMUST00000032738.6) transcript is recommended as the knockout region. The region contains 155bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Chrna7* 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, Nullizygous mice lack hippocampal fast nicotinic currents but show nicotine-induced seizures as well as altered anxiety behavior, fertility defects, airway basal cell hyperplasia. and higher TNF sythesis when endotoxemic. Newborns homozygous for a knock-in allele die with increased neuron apoptosis.
- The *Chrna7* 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.



# Gene information (NCBI)

## Chrna7 cholinergic receptor, nicotinic, alpha polypeptide 7 [Mus musculus (house mouse)]

Gene ID: 11441, updated on 12-Mar-2019

### Summary



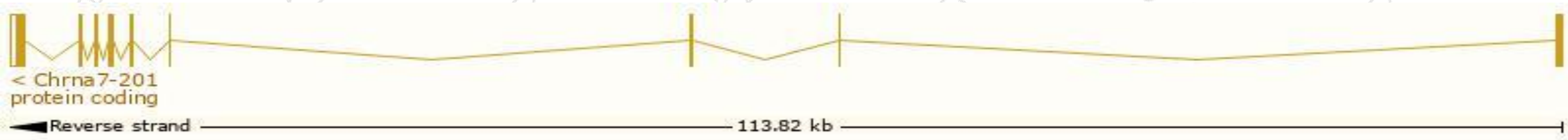
<b>Official Symbol</b>	Chma7 provided by <a href="#">MGI</a>
<b>Official Full Name</b>	cholinergic receptor, nicotinic, alpha polypeptide 7 provided by <a href="#">MGI</a>
<b>Primary source</b>	<a href="#">MGI:MGI:99779</a>
<b>See related</b>	<a href="#">Ensembl:ENSMUSG00000030525</a>
<b>Gene type</b>	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>	Acra7, alpha7, nAChR
<b>Expression</b>	Biased expression in adrenal adult (RPKM 6.7), CNS E18 (RPKM 3.8) and 10 other tissues <a href="#">See more</a>

# Transcript information (Ensembl)

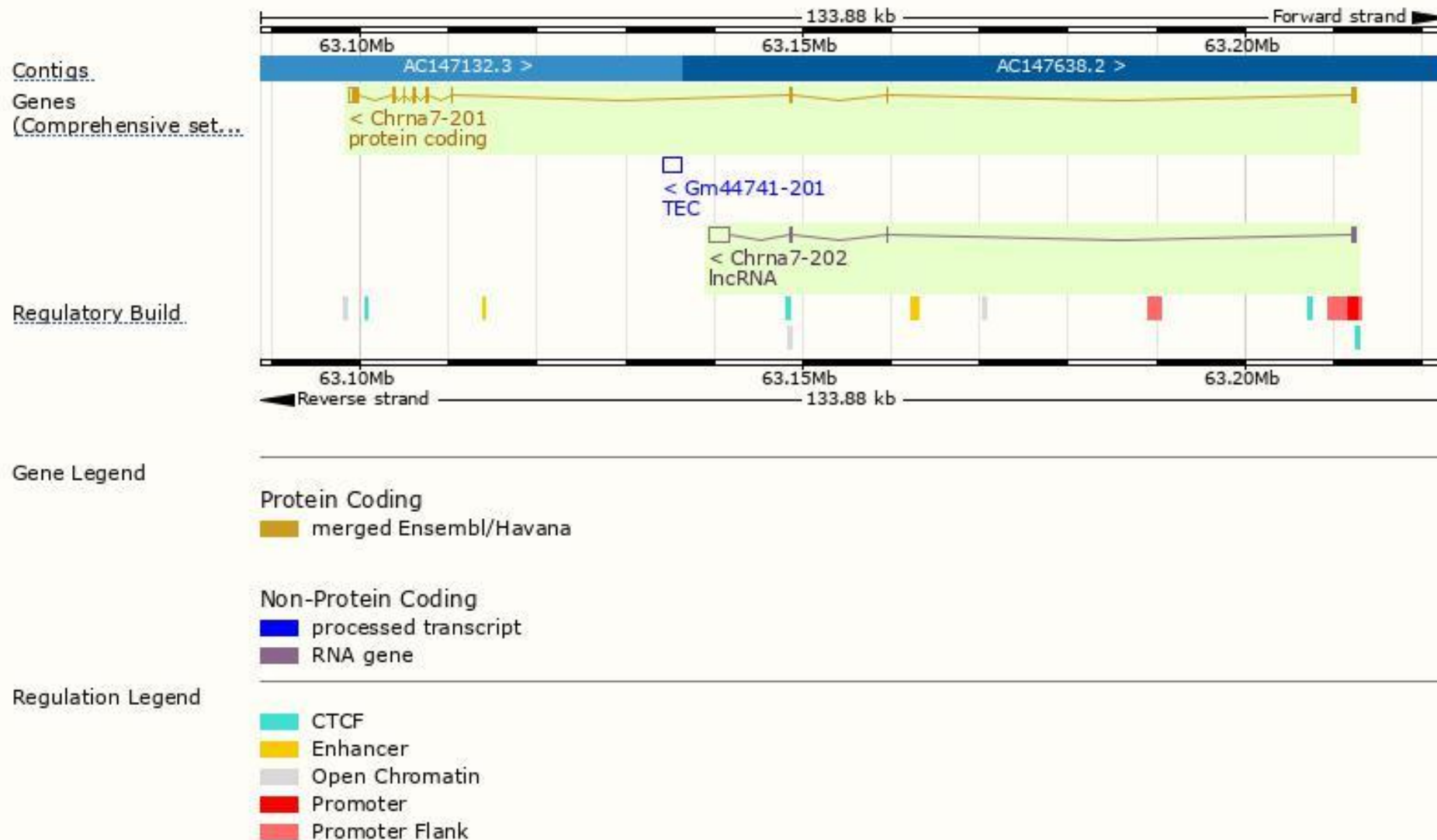
The gene has 2 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Chrna7-201	<a href="#">ENSMUST00000032738.6</a>	2078	<a href="#">502aa</a>	Protein coding	<a href="#">CCDS21329</a>	<a href="#">P49582 Q53YJ9</a>	TSL:1 GENCODE basic APPRIS P1
Chrna7-202	<a href="#">ENSMUST00000208304.1</a>	2814	No protein	Processed transcript	-	-	TSL:1

The strategy is based on the design of *Chrna7-201* transcript,The transcription is shown below

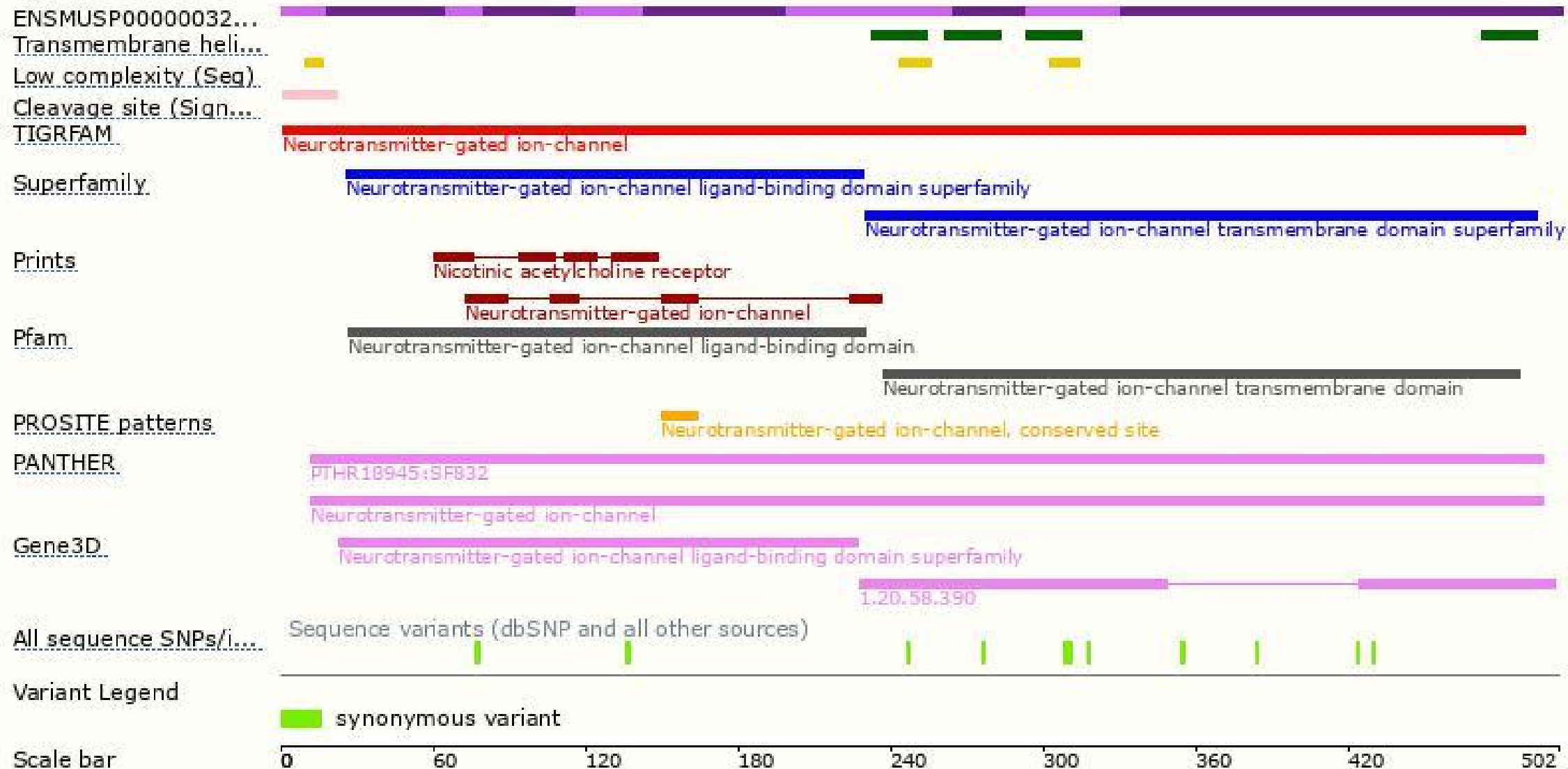


# Genomic location distribution

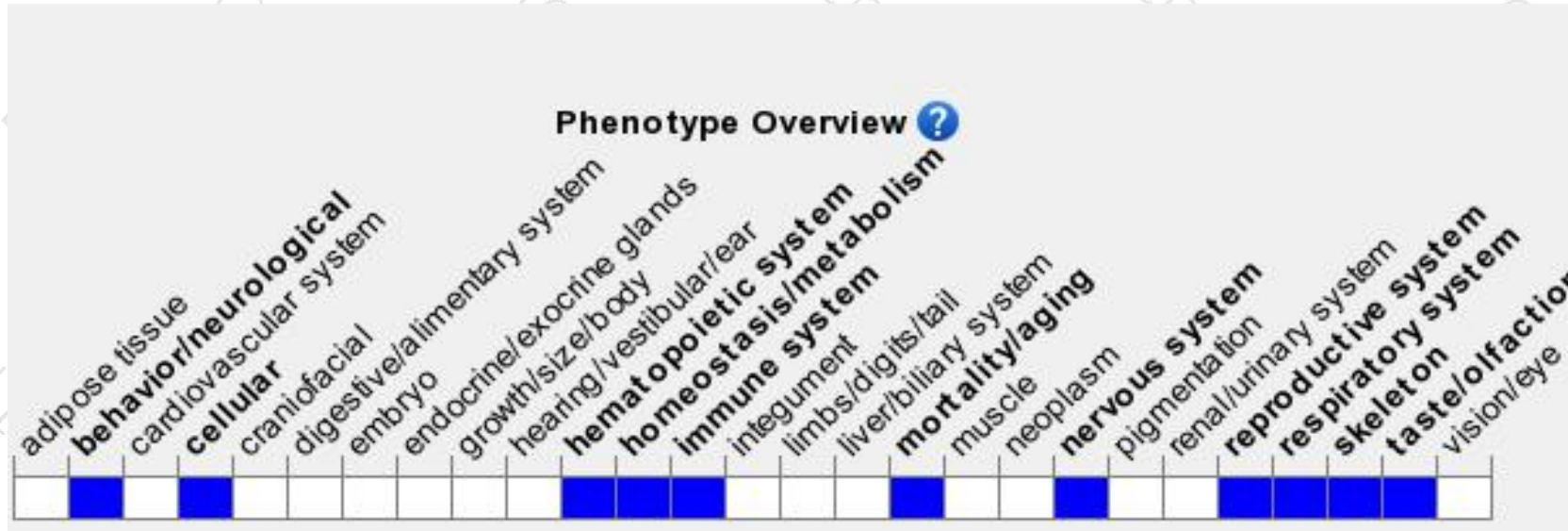




# Protein domain



# 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, Nullizygous mice lack hippocampal fast nicotinic currents but show nicotine-induced seizures as well as altered anxiety behavior, fertility defects, airway basal cell hyperplasia. and higher TNF  $\alpha$  when endotoxemic. Newborns homozygous for a knock-in allele die with increased neuron apoptosis.

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

Tel: 400-9660890

