

# *Gigyf2* Cas9-CKO Strategy

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**Reviewer:**

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**Design Date:**

**2020-1-4**

# Project Overview

**Project Name**

***Gigyf2***

**Project type**

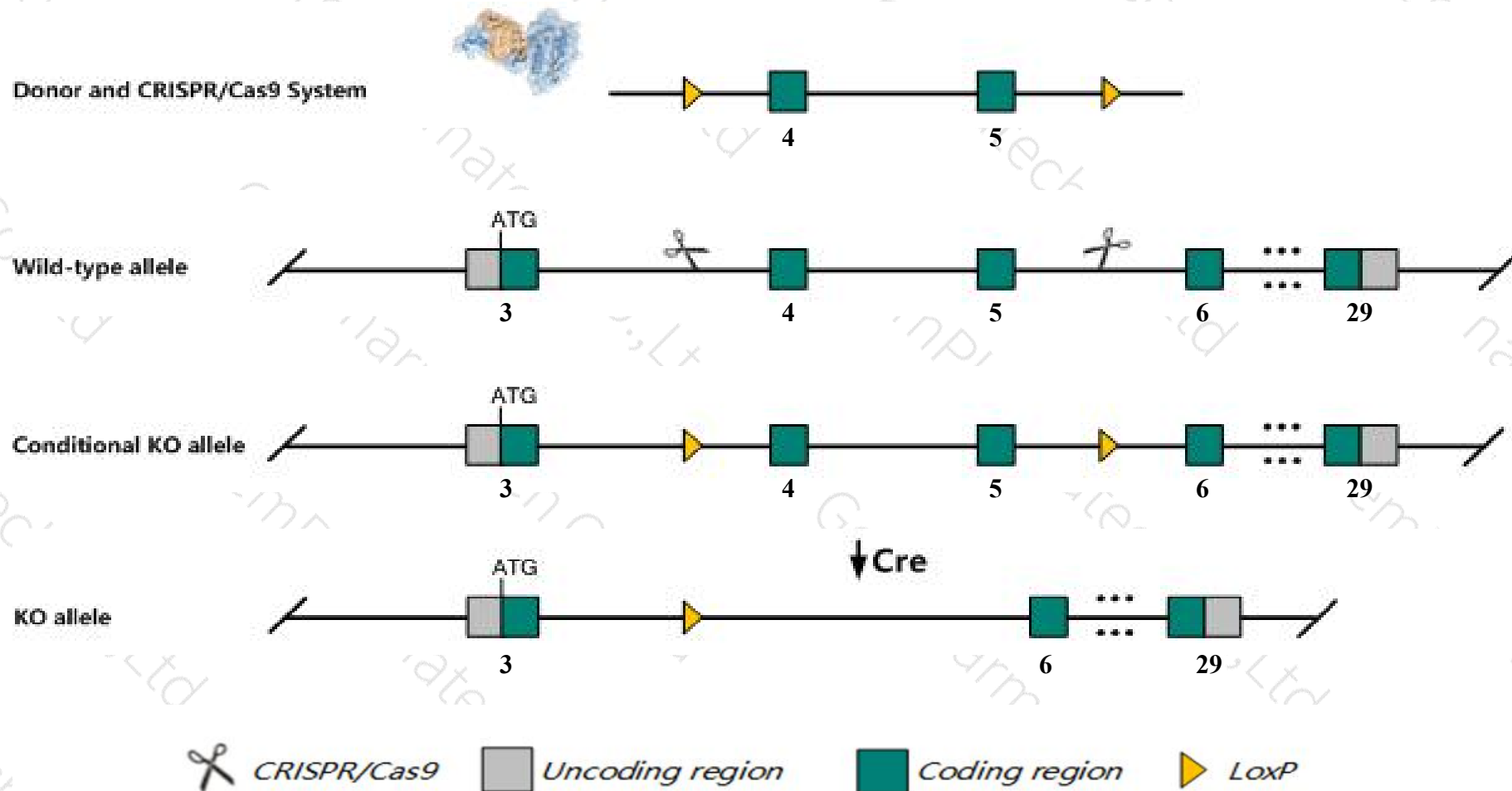
**Cas9-CKO**

**Strain background**

**C57BL/6JGpt**

# Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Gigyl2* gene. The schematic diagram is as follows:



- The *Gigyf2* gene has 23 transcripts. According to the structure of *Gigyf2* gene, exon4-exon5 of *Gigyf2-201* (ENSMUST00000027475.14) transcript is recommended as the knockout region. The region contains 226bp coding sequence. Knock out the region will result in disruption of protein function.
- Transcript *Gigyf2 -203,209,212,213,215* may not be affected.
- In this project we use CRISPR/Cas9 technology to modify *Gigyf2* gene. The brief process is as follows: gRNA was transcribed in vitro, donor was constructed. Cas9, gRNA 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 neonatal and postnatal lethality. Mice heterozygous for a knock-out allele exhibit impaired motor coordination with motor neuron degeneration.
- The *Gigyf2* gene is located on the Chr1. 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)

## Gigyf2 GRB10 interacting GYF protein 2 [Mus musculus (house mouse)]

Gene ID: 227331, updated on 7-Apr-2019

### Summary



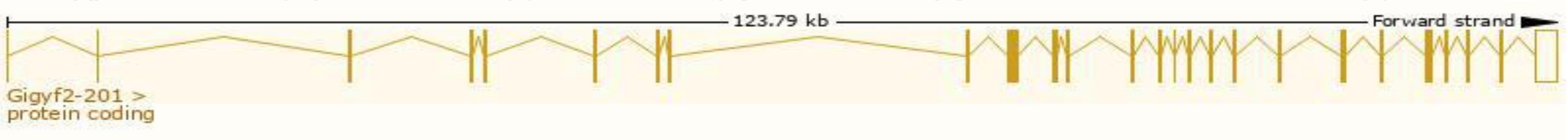
<b>Official Symbol</b>	Gigyf2 provided by <a href="#">MGI</a>
<b>Official Full Name</b>	GRB10 interacting GYF protein 2 provided by <a href="#">MGI</a>
<b>Primary source</b>	<a href="#">MGI:MGI:2138584</a>
<b>See related</b>	<a href="#">Ensembl:ENSMUSG00000048000</a>
<b>Gene type</b>	protein coding
<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>	2610016F01Rik, A830080H02Rik, A1852361, AW259676, BC006835, Tnrc15, mKIAA0642
<b>Expression</b>	Ubiquitous expression in placenta adult (RPKM 11.1), CNS E11.5 (RPKM 9.9) and 28 other tissues <a href="#">See more</a>
<b>Orthologs</b>	<a href="#">human</a> <a href="#">all</a>

# Transcript information (Ensembl)

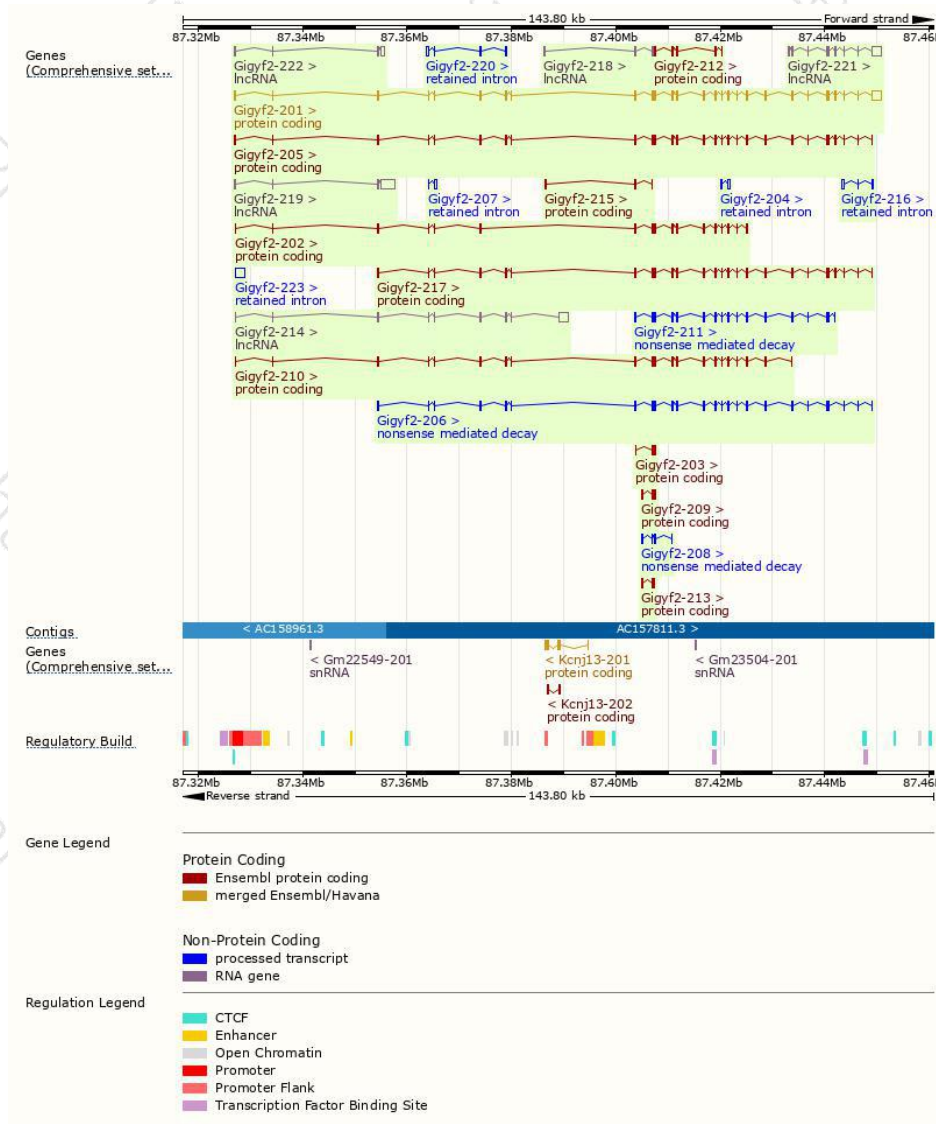
The gene has 23 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Gigyf2-201	<a href="#">ENSMUST00000027475.14</a>	5724	<a href="#">1291aa</a>	Protein coding	<a href="#">CCDS15133</a>	<a href="#">Q6Y7W8</a>	TSL:1 GENCODE basic APPRIS P3
Gigyf2-205	<a href="#">ENSMUST00000172794.7</a>	4029	<a href="#">1285aa</a>	Protein coding	<a href="#">CCDS56636</a>	<a href="#">G3UYG6</a>	TSL:5 GENCODE basic APPRIS ALT2
Gigyf2-217	<a href="#">ENSMUST00000174501.7</a>	3876	<a href="#">1291aa</a>	Protein coding	<a href="#">CCDS15133</a>	<a href="#">Q6Y7W8</a>	TSL:5 GENCODE basic APPRIS P3
Gigyf2-210	<a href="#">ENSMUST00000173173.7</a>	2765	<a href="#">877aa</a>	Protein coding	-	<a href="#">G3UYR9</a>	CDS 3' incomplete TSL:1
Gigyf2-202	<a href="#">ENSMUST00000164992.8</a>	2330	<a href="#">721aa</a>	Protein coding	-	<a href="#">E9Q2M5</a>	CDS 3' incomplete TSL:1
Gigyf2-212	<a href="#">ENSMUST00000173636.1</a>	773	<a href="#">258aa</a>	Protein coding	-	<a href="#">G3UZW5</a>	5' and 3' truncations in transcript evidence prevent annotation of the start and the end of the CDS. CDS 5' and 3' incomplete TSL:5
Gigyf2-203	<a href="#">ENSMUST00000172736.7</a>	666	<a href="#">222aa</a>	Protein coding	-	<a href="#">G3UZS9</a>	5' and 3' truncations in transcript evidence prevent annotation of the start and the end of the CDS. CDS 5' and 3' incomplete TSL:3
Gigyf2-209	<a href="#">ENSMUST00000173152.1</a>	618	<a href="#">172aa</a>	Protein coding	-	<a href="#">G3UYH4</a>	CDS 3' incomplete TSL:5
Gigyf2-215	<a href="#">ENSMUST00000174334.7</a>	533	<a href="#">84aa</a>	Protein coding	-	<a href="#">G3UXF2</a>	CDS 3' incomplete TSL:5
Gigyf2-213	<a href="#">ENSMUST00000173663.1</a>	386	<a href="#">110aa</a>	Protein coding	-	<a href="#">G3UWT6</a>	CDS 3' incomplete TSL:3
Gigyf2-206	<a href="#">ENSMUST00000172964.7</a>	3721	<a href="#">1122aa</a>	Nonsense mediated decay	-	<a href="#">G3UWR2</a>	TSL:5
Gigyf2-211	<a href="#">ENSMUST00000173235.7</a>	2826	<a href="#">787aa</a>	Nonsense mediated decay	-	<a href="#">G3UXZ7</a>	CDS 5' incomplete TSL:5
Gigyf2-208	<a href="#">ENSMUST00000173148.1</a>	566	<a href="#">42aa</a>	Nonsense mediated decay	-	<a href="#">G3UZM3</a>	TSL:5
Gigyf2-223	<a href="#">ENSMUST00000187038.1</a>	1962	No protein	Retained intron	-	-	TSL:NA
Gigyf2-216	<a href="#">ENSMUST00000174482.1</a>	778	No protein	Retained intron	-	-	TSL:2
Gigyf2-220	<a href="#">ENSMUST00000174605.1</a>	674	No protein	Retained intron	-	-	TSL:5
Gigyf2-204	<a href="#">ENSMUST00000172776.1</a>	558	No protein	Retained intron	-	-	TSL:3
Gigyf2-207	<a href="#">ENSMUST00000172976.1</a>	545	No protein	Retained intron	-	-	TSL:2
Gigyf2-221	<a href="#">ENSMUST00000174671.7</a>	3074	No protein	lncRNA	-	-	TSL:1
Gigyf2-219	<a href="#">ENSMUST00000174583.7</a>	3015	No protein	lncRNA	-	-	TSL:1
Gigyf2-214	<a href="#">ENSMUST00000173850.7</a>	2520	No protein	lncRNA	-	-	TSL:5
Gigyf2-222	<a href="#">ENSMUST00000174846.7</a>	995	No protein	lncRNA	-	-	TSL:1
Gigyf2-218	<a href="#">ENSMUST00000174535.1</a>	586	No protein	lncRNA	-	-	TSL:5

The strategy is based on the design of *Gigyf2-201* transcript,The transcription is shown below

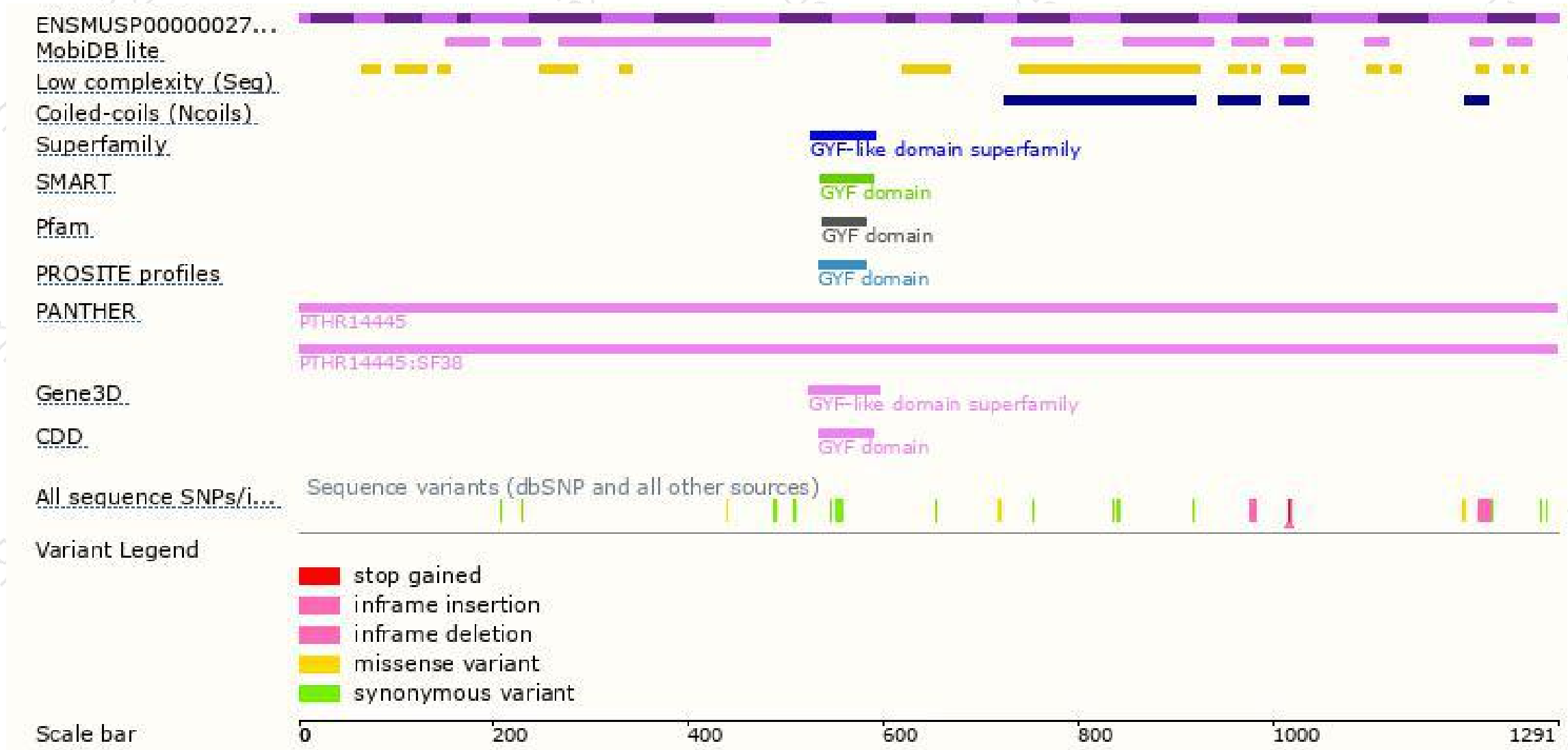


# Genomic location distribution

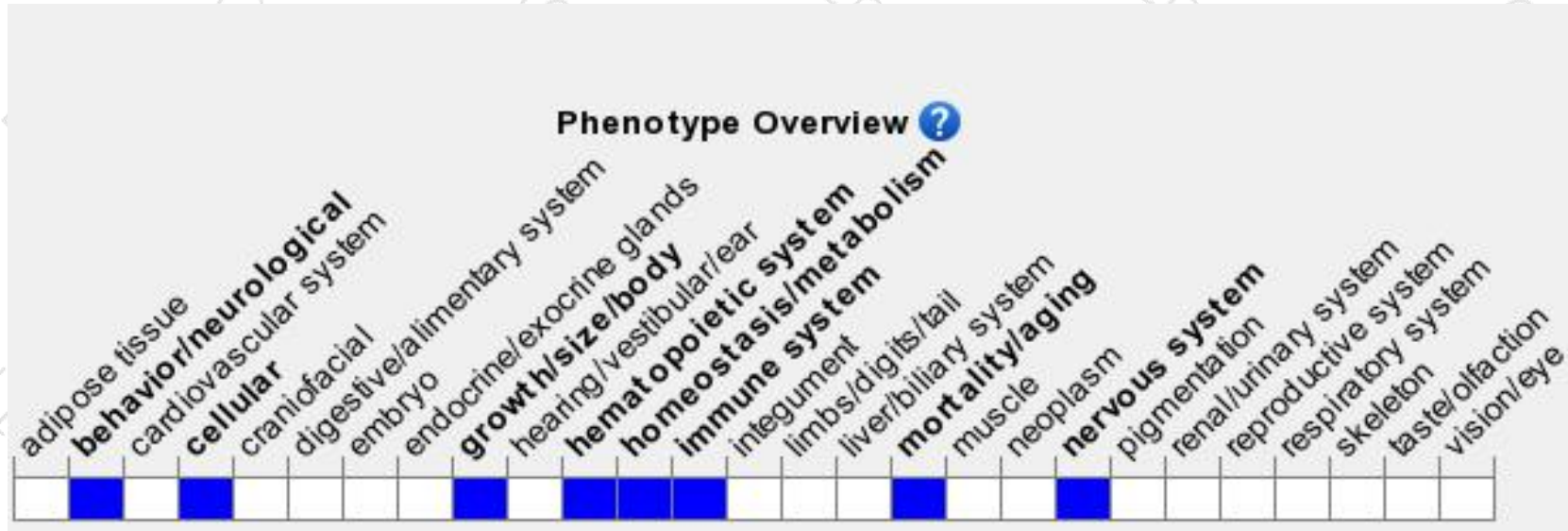




# Protein domain



# 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 neonatal and postnatal lethality.

Mice heterozygous for a knock-out allele exhibit impaired motor coordination with motor neuron degeneration.

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

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