

Mdga1 Cas9-CKO Strategy

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Reviewer:

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Project Overview

Project Name

Mdga1

Project type

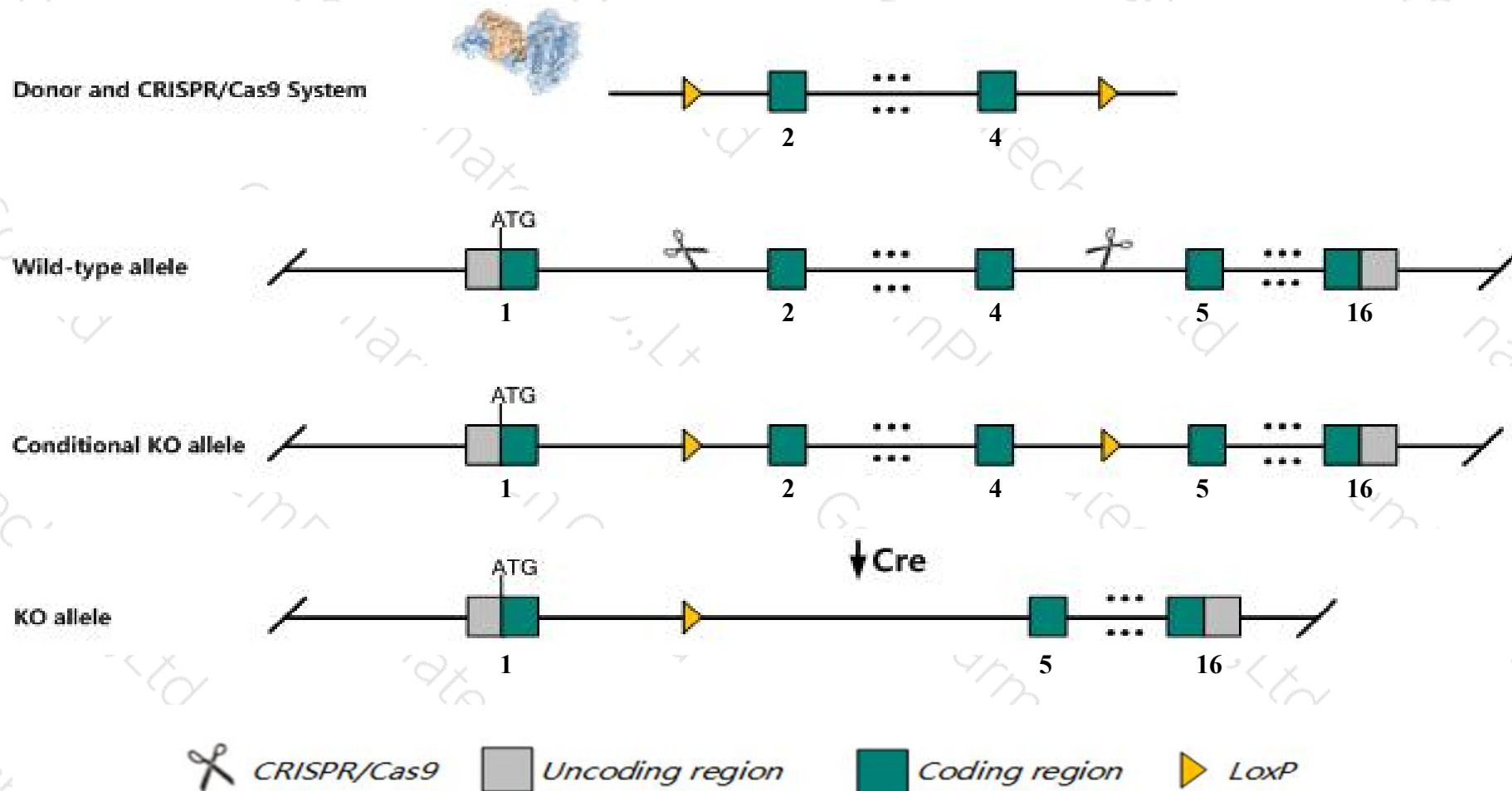
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

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



- The *Mdgal* gene has 10 transcripts. According to the structure of *Mdgal* gene, exon2-exon4 of *Mdgal*-201 (ENSMUST00000073556.11) transcript is recommended as the knockout region. The region contains 512bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Mdgal* 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 a knock-out allele exhibit abnormal neuronal migration during corticogenesis that is resolved by P7
- Transcript 206 CDS 5' incomplete the influences is unknown. Transcript 210 CDS 5' and 3' incomplete the influences is unknown.
- The *Mdgal* gene is located on the Chr17. 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)

Mdga1 MAM domain containing glycosylphosphatidylinositol anchor 1 [Mus musculus (house mouse)]

Gene ID: 74762, updated on 12-Mar-2019

Summary



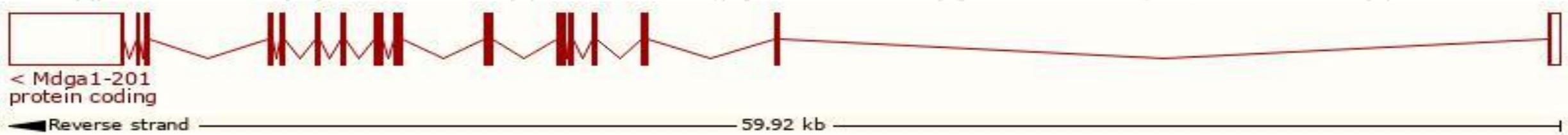
Official Symbol	Mdga1 provided by MGI
Official Full Name	MAM domain containing glycosylphosphatidylinositol anchor 1 provided by MGI
Primary source	MGI:MGI:1922012
See related	Ensembl:ENSMUSG00000043557
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	1200011I03Rik, GPIM, Mamdc3
Expression	Biased expression in whole brain E14.5 (RPKM 10.3), CNS E14 (RPKM 9.8) and 13 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

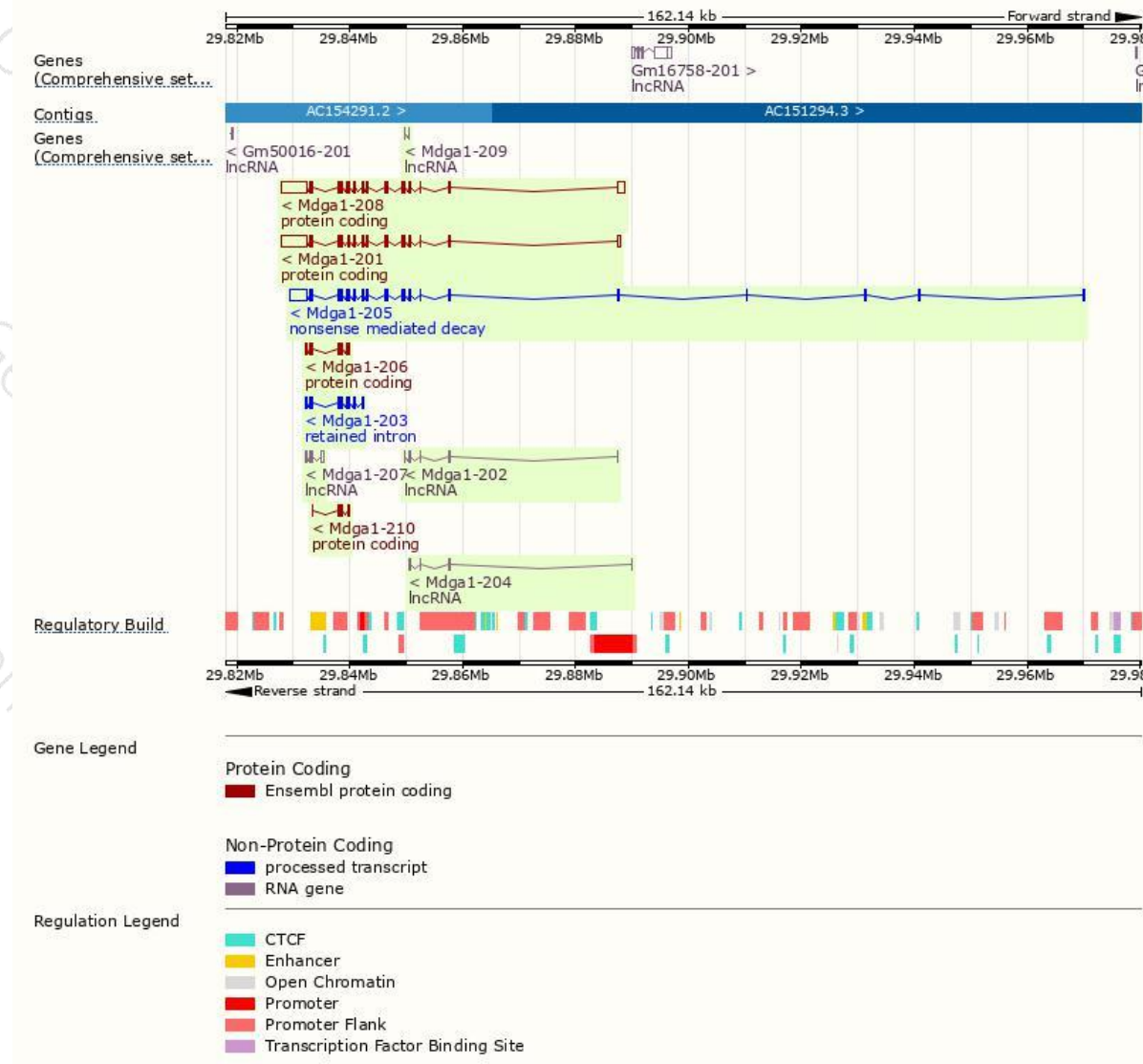
The gene has 10 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Mdga1-201	ENSMUST00000073556.11	7566	948aa	Protein coding	CCDS37540	D3Z499	TSL:5 GENCODE basic
Mdga1-208	ENSMUST00000171691.8	8425	956aa	Protein coding	-	Q0PMG2	TSL:5 GENCODE basic APPRIS P1
Mdga1-206	ENSMUST00000168044.2	951	187aa	Protein coding	-	F7ABV5	CDS 5' incomplete TSL:3
Mdga1-210	ENSMUST00000234251.1	478	159aa	Protein coding	-	-	5' and 3' truncations in transcript evidence prevent annotation of the start and the end of the CDS. CDS 5' and 3' incomplete
Mdga1-205	ENSMUST00000167190.8	6541	942aa	Nonsense mediated decay	-	E9Q6S8	TSL:5
Mdga1-203	ENSMUST00000165528.7	1477	No protein	Retained intron	-	-	TSL:1
Mdga1-207	ENSMUST00000170786.2	761	No protein	lncRNA	-	-	TSL:3
Mdga1-202	ENSMUST00000165211.1	669	No protein	lncRNA	-	-	TSL:3
Mdga1-204	ENSMUST00000167102.2	596	No protein	lncRNA	-	-	TSL:2
Mdga1-209	ENSMUST00000234114.1	201	No protein	lncRNA	-	-	

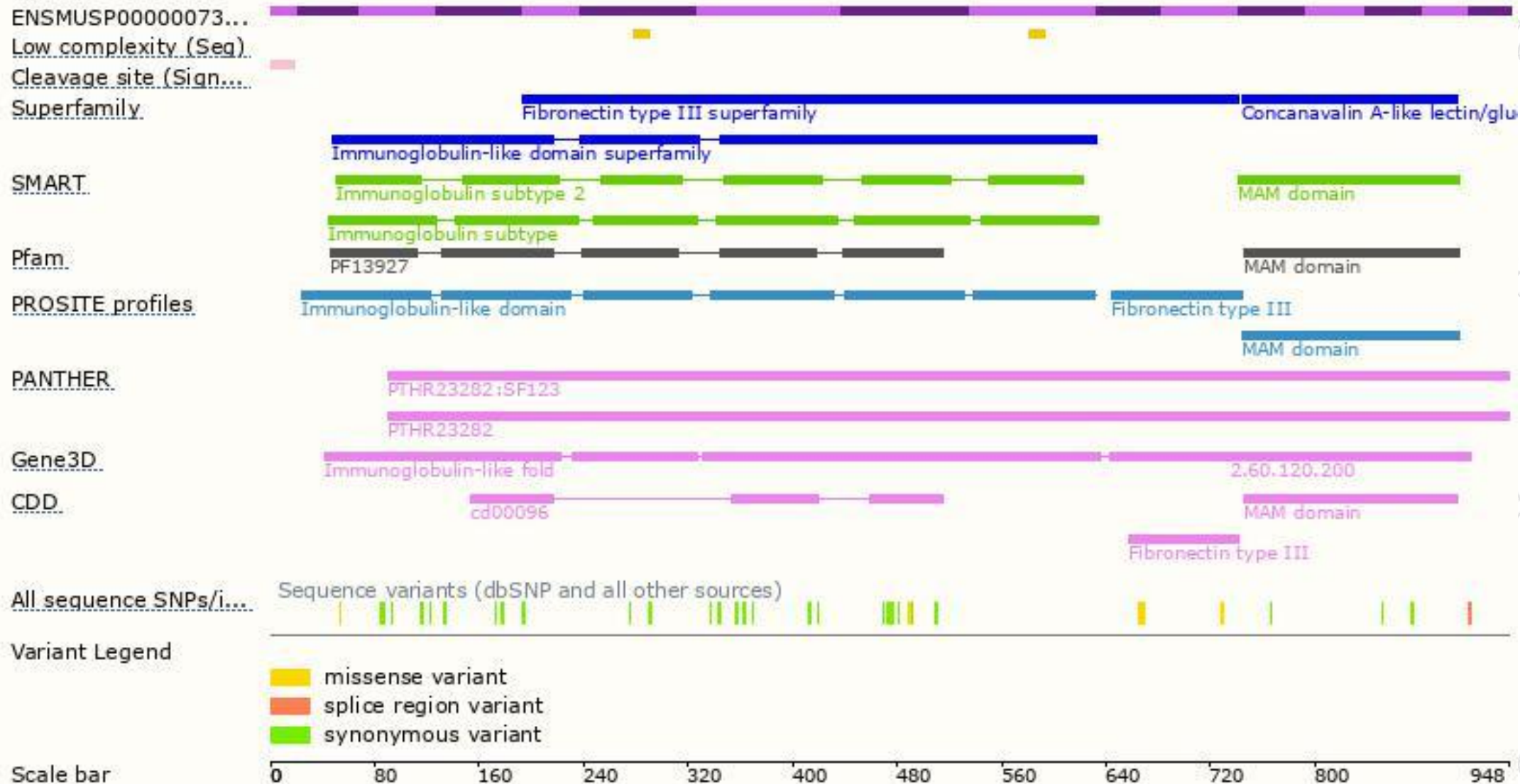
The strategy is based on the design of *Mdga1-201* transcript,The transcription is shown below



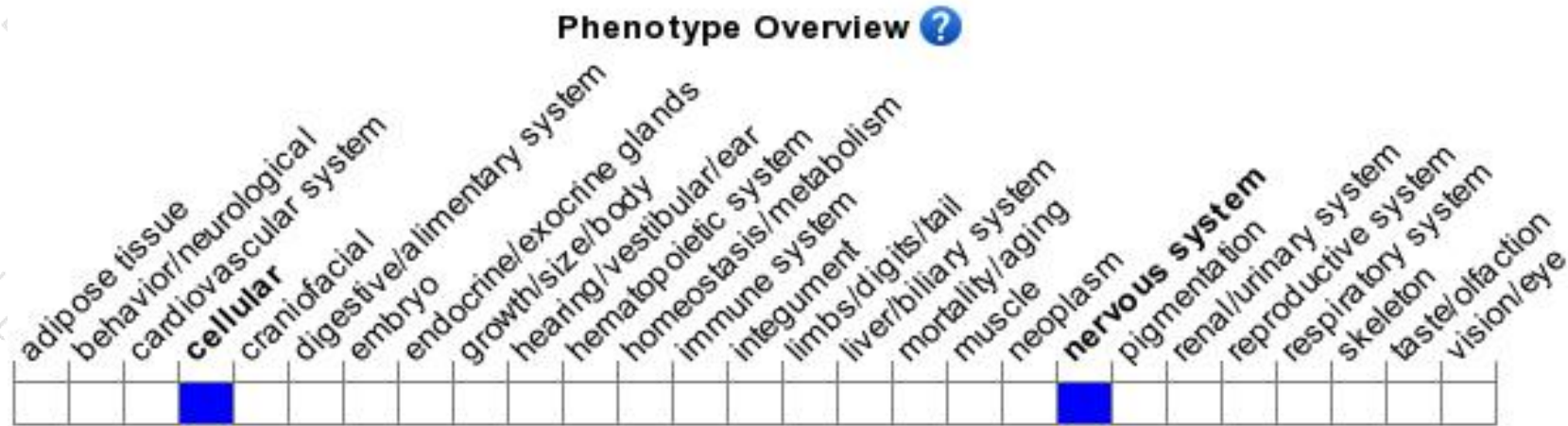
Genomic location distribution



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 abnormal neuronal migration during corticogenesis that is resolved by P7

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

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