

***Nos1* Cas9-CKO Strategy**

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Project Overview

Project Name

Nos1

Project type

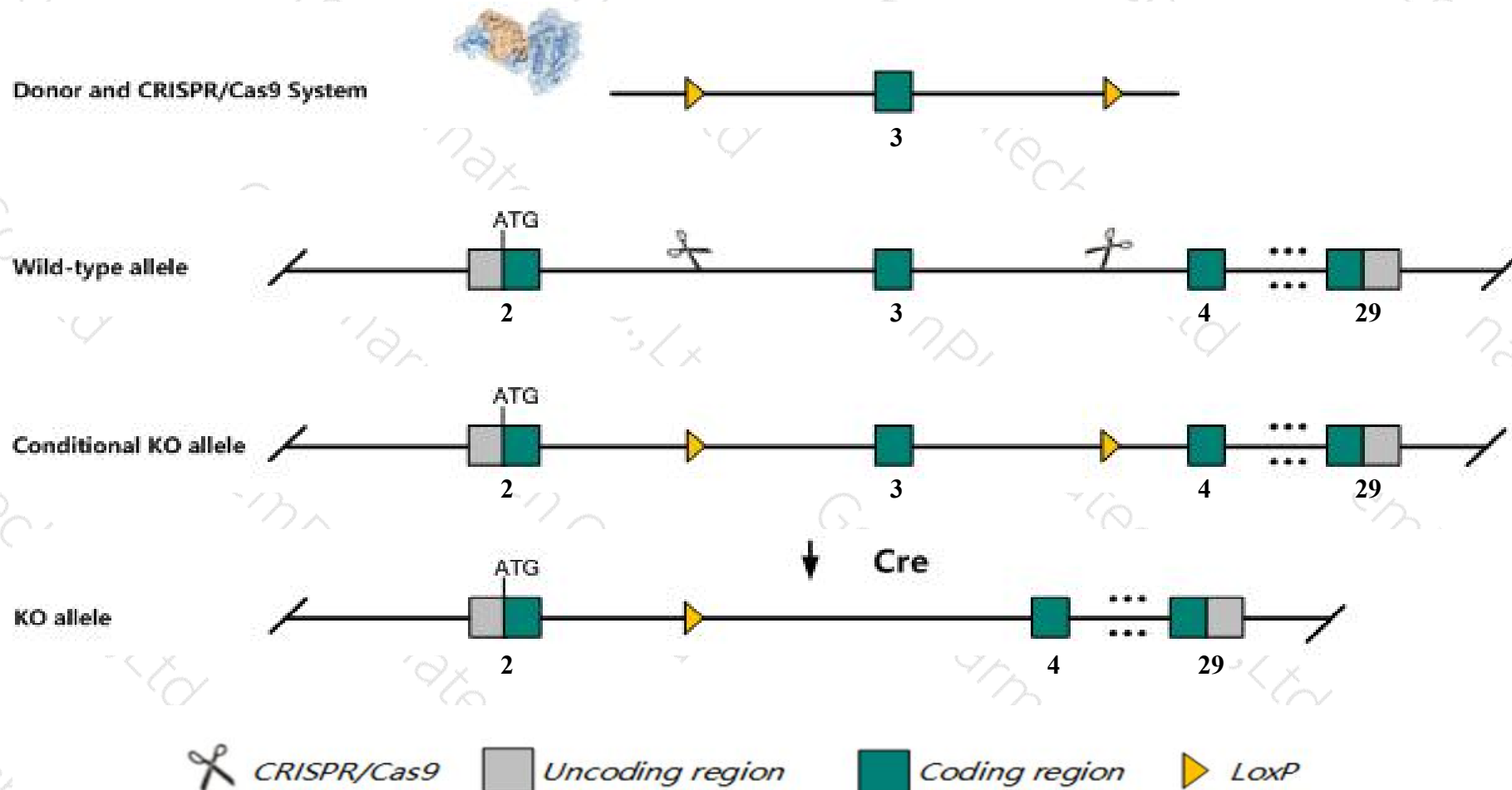
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Nos1* gene. The schematic diagram is as follows:



- The *Nos1* gene has 7 transcripts. According to the structure of *Nos1* gene, exon3 of *Nos1-206* (ENSMUST00000142742.8) transcript is recommended as the knockout region. The region contains 127bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Nos1* 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, Homozygous hypomorphic mice exhibit enlarged stomachs, abnormal pyloric and lower esophageal sphincters, age-related cardiac hypertrophy, altered alcohol consumption and responses, decreased ovulation and reduced REM sleep. Homozygous null mice display increased neurogenesis in the adult brain.
- The *Nos1* 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)

Nos1 nitric oxide synthase 1, neuronal [Mus musculus (house mouse)]

Gene ID: 18125, updated on 9-Apr-2019

Summary



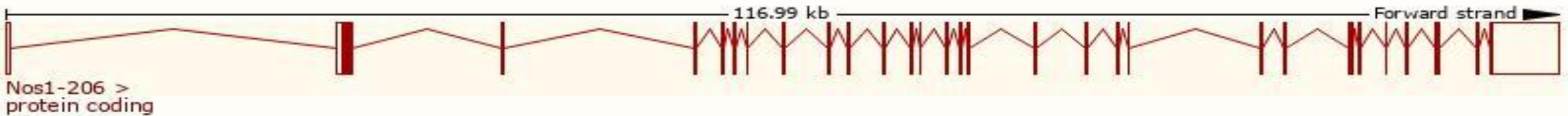
Official Symbol	Nos1 provided by MGI
Official Full Name	nitric oxide synthase 1, neuronal provided by MGI
Primary source	MGI:MGI:97360
See related	Ensembl:ENSMUSG00000029361
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	2310005C01Rik, N-NOS, NC-NOS, NO, NOS, NOS-I, Nos-1, bNOS, nNOS
Expression	Biased expression in cerebellum adult (RPKM 7.6), frontal lobe adult (RPKM 4.0) and 12 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

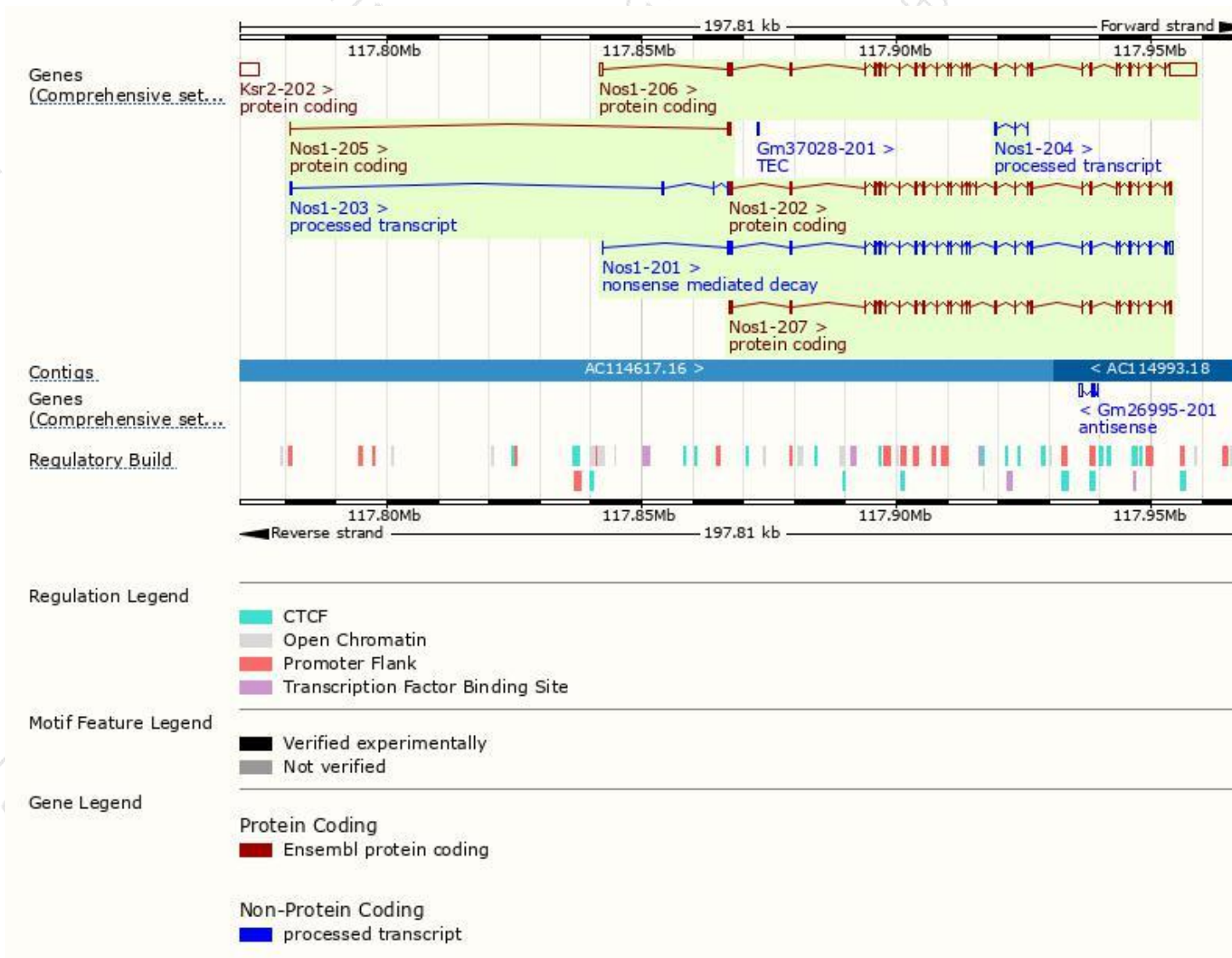
The gene has 7 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Nos1-206	ENSMUST00000142742.8	10123	1429aa	Protein coding	CCDS19606	Q9Z0J4	TSL:5 GENCODE basic APPRIS P2
Nos1-207	ENSMUST00000171055.1	4388	1429aa	Protein coding	CCDS19606	Q9Z0J4	TSL:1 GENCODE basic APPRIS P2
Nos1-202	ENSMUST00000102557.9	4591	1463aa	Protein coding	-	F8WGF2	TSL:5 GENCODE basic APPRIS ALT 2
Nos1-205	ENSMUST00000138579.2	735	80aa	Protein coding	-	S4R1D5	CDS 3' incomplete TSL:2
Nos1-201	ENSMUST00000086451.11	5600	1425aa	Nonsense mediated decay	-	S4R255	TSL:1
Nos1-203	ENSMUST00000124194.1	641	No protein	Processed transcript	-	-	TSL:3
Nos1-204	ENSMUST00000138554.1	631	No protein	Processed transcript	-	-	TSL:3

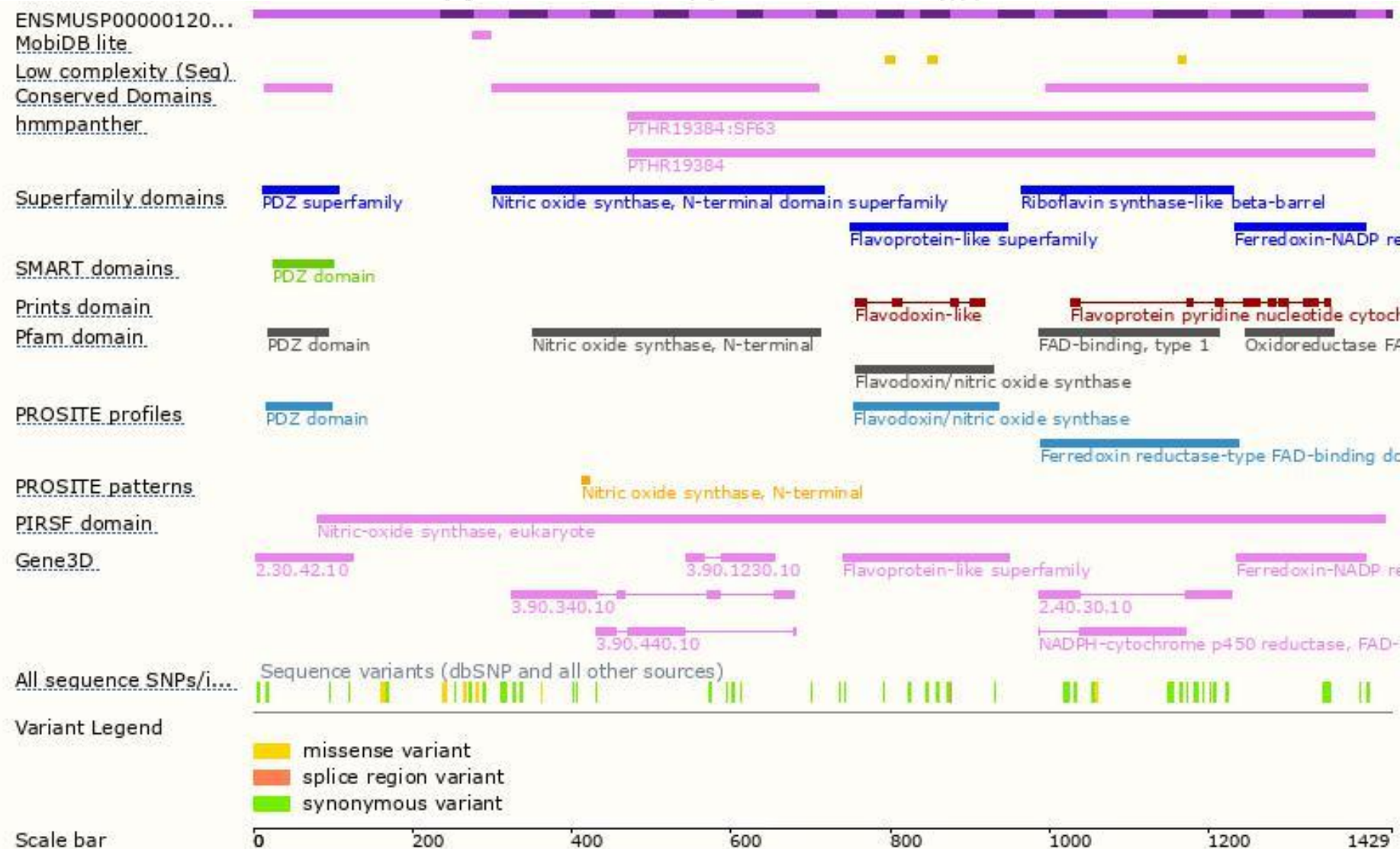
The strategy is based on the design of *Nos1-206* transcript,The transcription is shown below



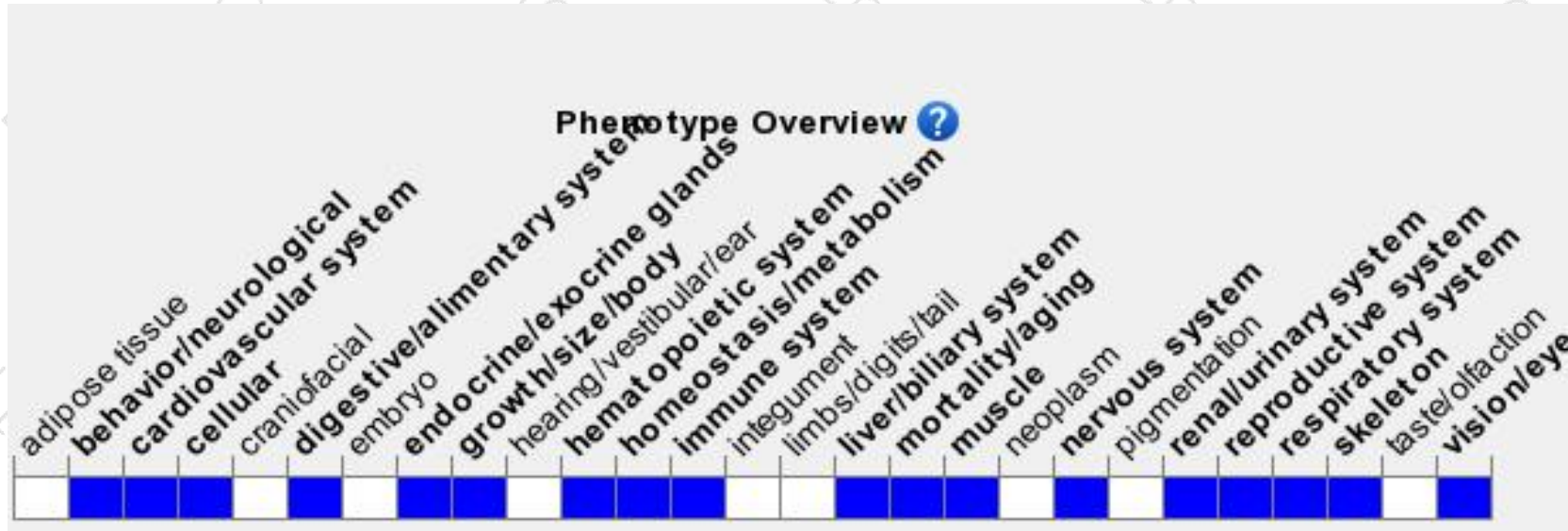
Genomic location distribution



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, Homozygous hypomorphic mice exhibit enlarged stomachs, abnormal pyloric and lower esophageal sphincters, age-related cardiac hypertrophy, altered alcohol consumption and responses, decreased ovulation and reduced REM sleep. Homozygous null mice display increased neurogenesis in the adult brain.

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

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