

Nmbr Cas9-CKO Strategy

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Project Overview

Project Name

Nmbr

Project type

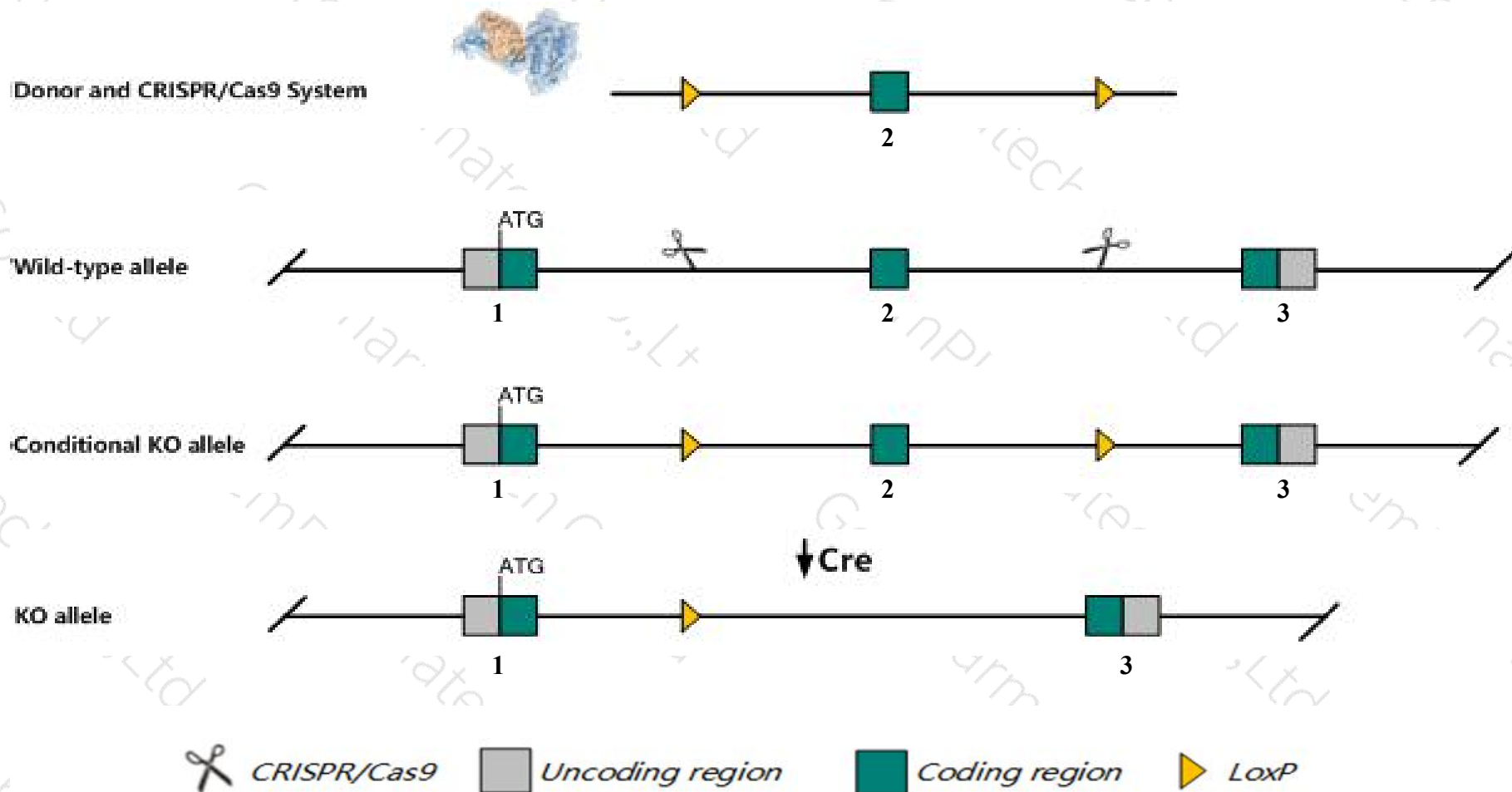
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

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



Technical routes

- The *Nmbr* gene has 8 transcripts. According to the structure of *Nmbr* gene, exon2 of *Nmbr-201* (ENSMUST00000020015.9) transcript is recommended as the knockout region. The region contains 349bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Nmbr* 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 show a 50% reduction in the thermoregulatory response to neuromedin B as well as impaired maternal behavior in response to restraint-induced stress.
- The N-terminal of *Nmbr* gene will remain several amino acids, it may remain the partial function of *Nmbr* gene.
- Transcript *Nmbr*-202&204&205 may not be affected.
- The effect on transcript *Nmbr*-206&207&208 is unknown.
- The floxed region is near to the N-terminal of *Gm47698* and *B230364G03Rik* gene, this strategy may influence the regulatory function of the N-terminal of these genes.
- The *Nmbr* gene is located on the Chr10. 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)

Nmbr neuromedin B receptor [*Mus musculus* (house mouse)]

Gene ID: 18101, updated on 12-Aug-2019

Summary

- Official Symbol** Nmbr provided by [MGI](#)
- Official Full Name** neuromedin B receptor provided by [MGI](#)
- Primary source** [MGI:MGI:1100525](#)
- See related** [Ensembl:ENSMUSG00000019865](#)
- 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** BB182387
- Expression** Biased expression in testis adult (RPKM 4.4), frontal lobe adult (RPKM 2.7) and 5 other tissues [See more](#)
- Orthologs** [human](#) [all](#)

Genomic context

Location: 10; 10 A2

Exon count: 4

See Nmbr in [Genome Data Viewer](#)

Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	10	NC_000076.6 (14759356..14771458)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	10	NC_000076.5 (14480095..14490362)

Transcript information (Ensembl)

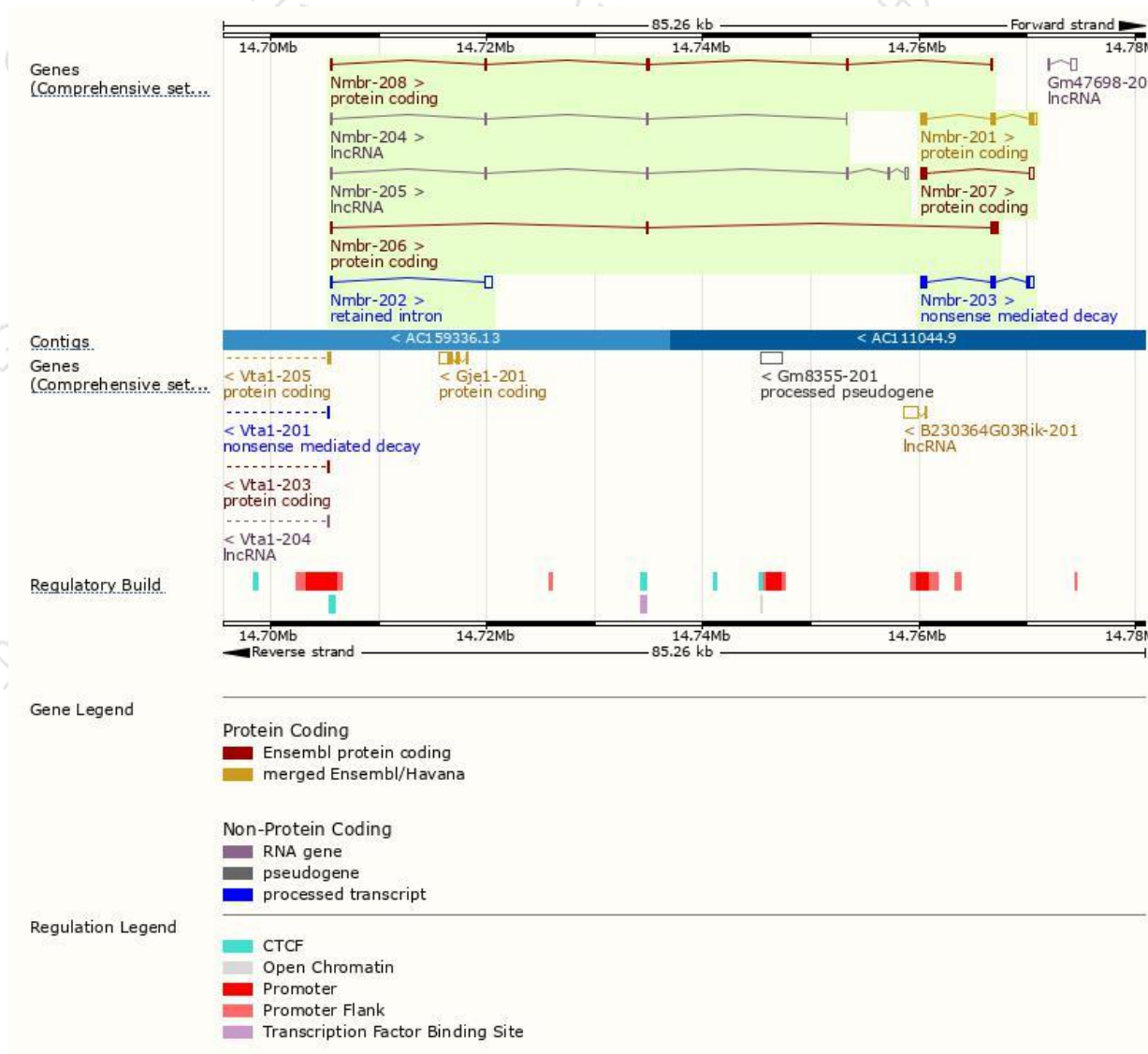
The gene has 8 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Nmbr-201	ENSMUST00000020015.9	1599	390aa	Protein coding	CCDS23707	Q54799 Q0VEH1	TSL:1 GENCODE basic APPRIS P1
Nmbr-207	ENSMUST00000190751.1	921	179aa	Protein coding	-	A0A087WQJ7	TSL:1 GENCODE basic
Nmbr-206	ENSMUST00000190114.1	662	141aa	Protein coding	-	A0A087WRS7	TSL:3 GENCODE basic
Nmbr-208	ENSMUST00000191238.6	640	24aa	Protein coding	-	A0A087WPA3	CDS 3' incomplete TSL:3
Nmbr-203	ENSMUST00000186382.6	1354	257aa	Nonsense mediated decay	-	A0A087WP36	TSL:1
Nmbr-202	ENSMUST00000186175.1	672	No protein	Retained intron	-	-	TSL:3
Nmbr-205	ENSMUST00000188021.6	910	No protein	lncRNA	-	-	TSL:1
Nmbr-204	ENSMUST00000187449.6	447	No protein	lncRNA	-	-	TSL:3

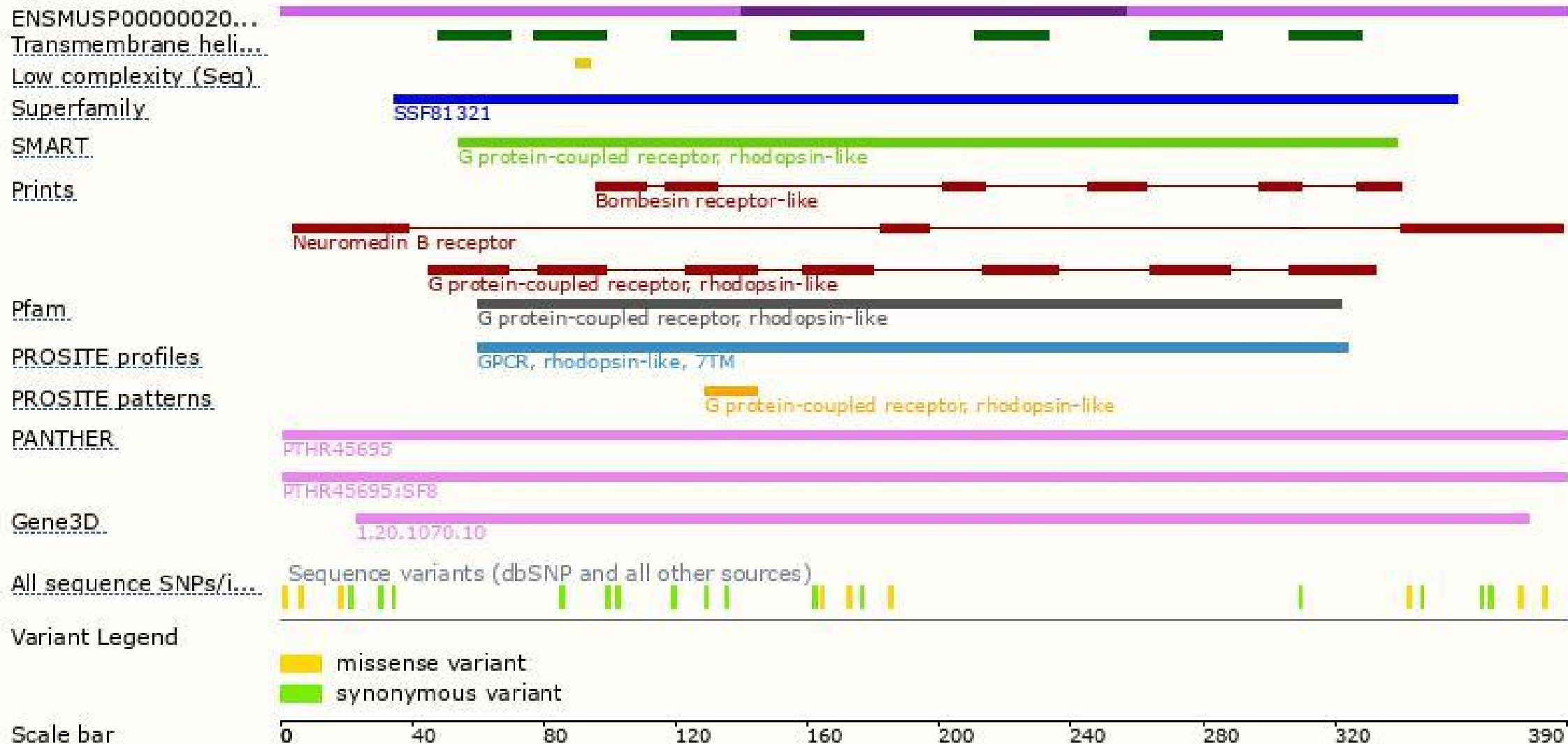
The strategy is based on the design of *Nmbr-201* transcript,The transcription is shown below



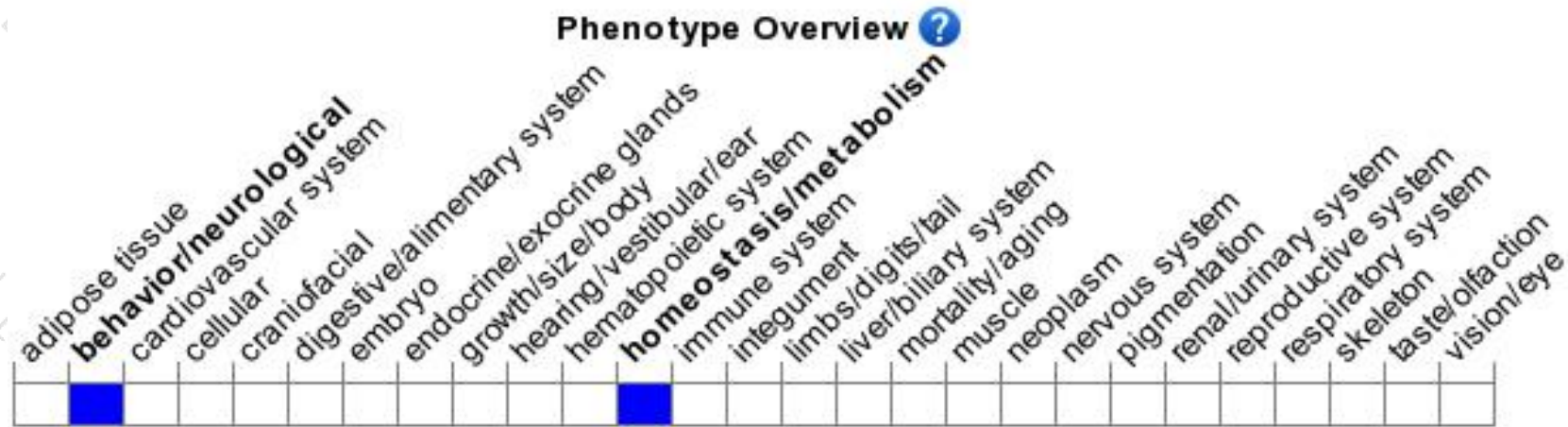
Genomic location distribution



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 show a 50% reduction in the thermoregulatory response to neuromedin B as well as impaired maternal behavior in response to restraint-induced stress.

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

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