

Abca2 Cas9-CKO Strategy

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Reviewer:

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Project Overview

Project Name

Abca2

Project type

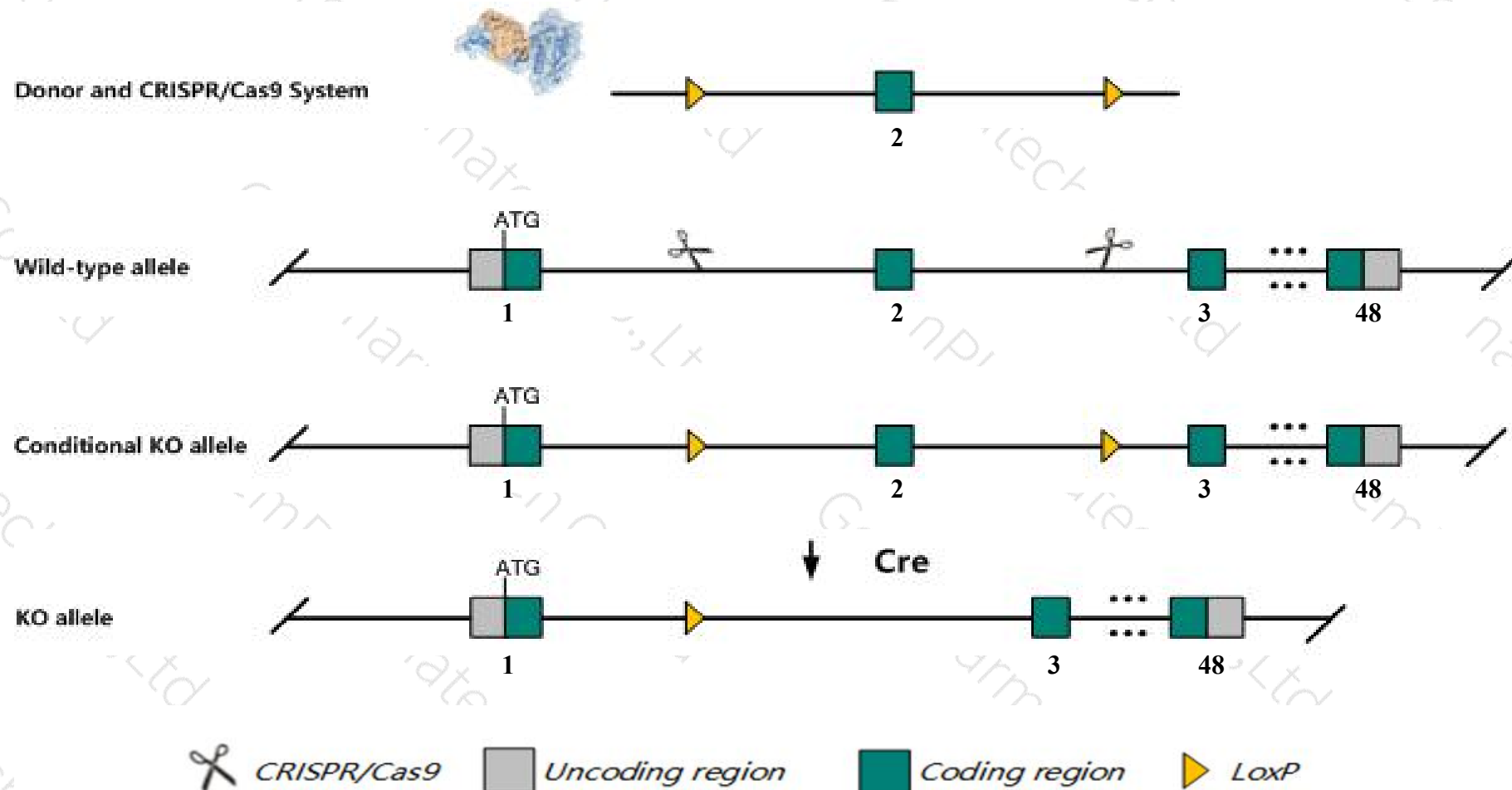
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Abca2* gene. The schematic diagram is as follows:



Technical routes

- The *Abca2* gene has 7 transcripts. According to the structure of *Abca2* gene, exon2 of *Abca2-201* (ENSMUST00000102919.3) transcript is recommended as the knockout region. The region contains 94bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Abca2* 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, Null mice show tremors, hyperactivity, abnormal coordination, and alterations in CNS myelin sheath ultrastructure,
- The *Abca2* gene is located on the Chr2. 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)

Abca2 ATP-binding cassette, sub-family A (ABC1), member 2 [Mus musculus (house mouse)]

Gene ID: 11305, updated on 14-Feb-2019

Summary



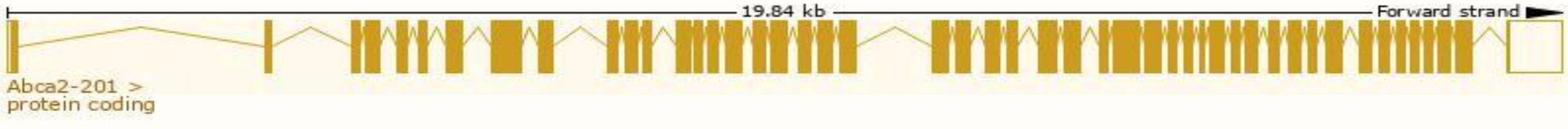
Official Symbol	Abca2 provided by MGI
Official Full Name	ATP-binding cassette, sub-family A (ABC1), member 2 provided by MGI
Primary source	MGI:MGI:99606
See related	Ensembl:ENSMUSG00000026944
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	AI413825, Abc2, D2H0S1474E, mKIAA1062
Expression	Broad expression in genital fat pad adult (RPKM 51.2), cerebellum adult (RPKM 40.0) and 22 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

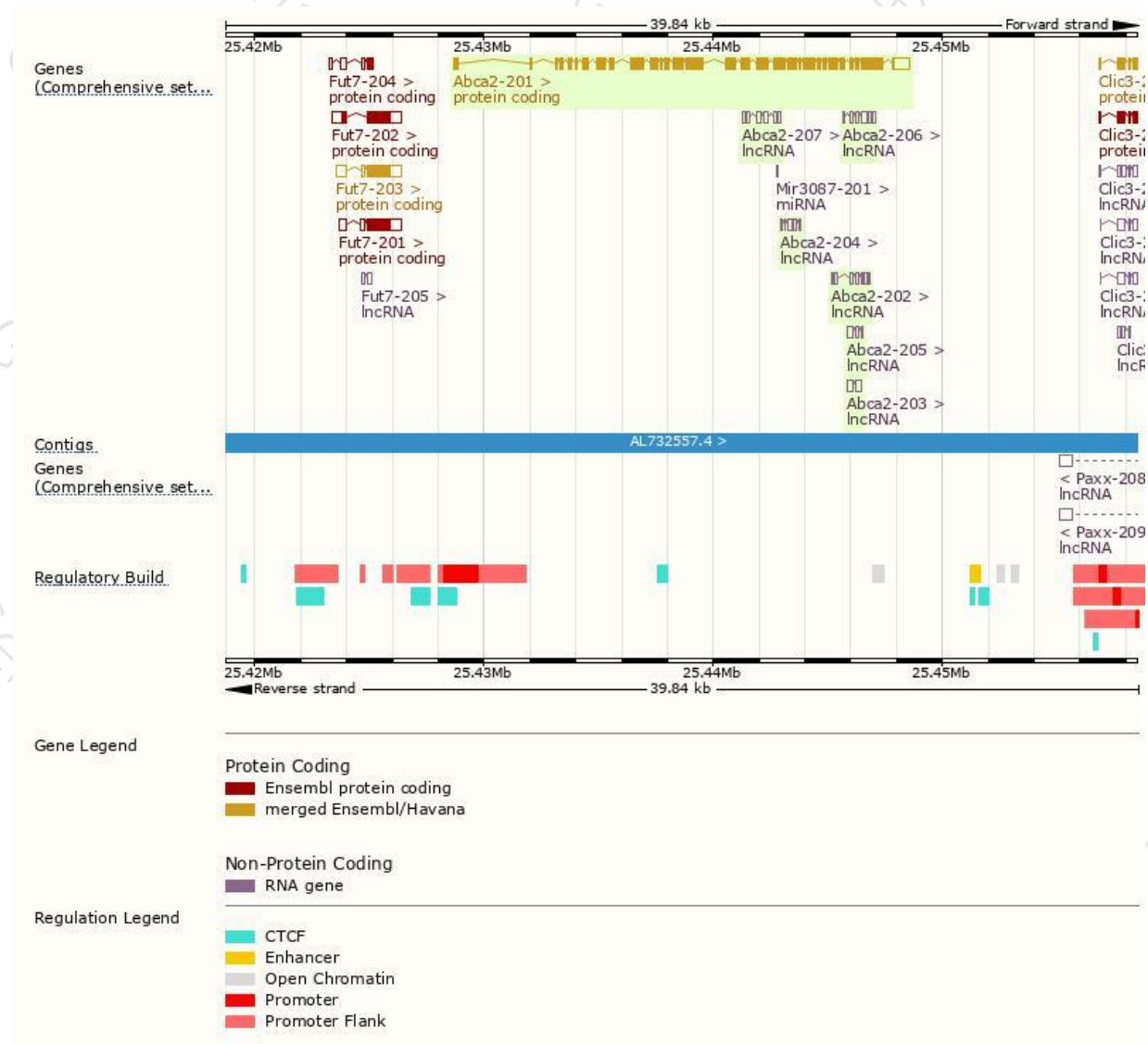
The gene has 7 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Abca2-201	ENSMUST00000102919.3	8033	2433aa	Protein coding	CCDS15773	A2AJ26	TSL:1 GENCODE basic APPRIS P1
Abca2-206	ENSMUST00000149385.7	804	No protein	lncRNA	-	-	TSL:5
Abca2-207	ENSMUST00000150550.1	759	No protein	lncRNA	-	-	TSL:3
Abca2-202	ENSMUST00000125520.7	710	No protein	lncRNA	-	-	TSL:5
Abca2-203	ENSMUST00000141065.1	535	No protein	lncRNA	-	-	TSL:2
Abca2-205	ENSMUST00000144560.1	530	No protein	lncRNA	-	-	TSL:2
Abca2-204	ENSMUST00000143075.1	519	No protein	lncRNA	-	-	TSL:3

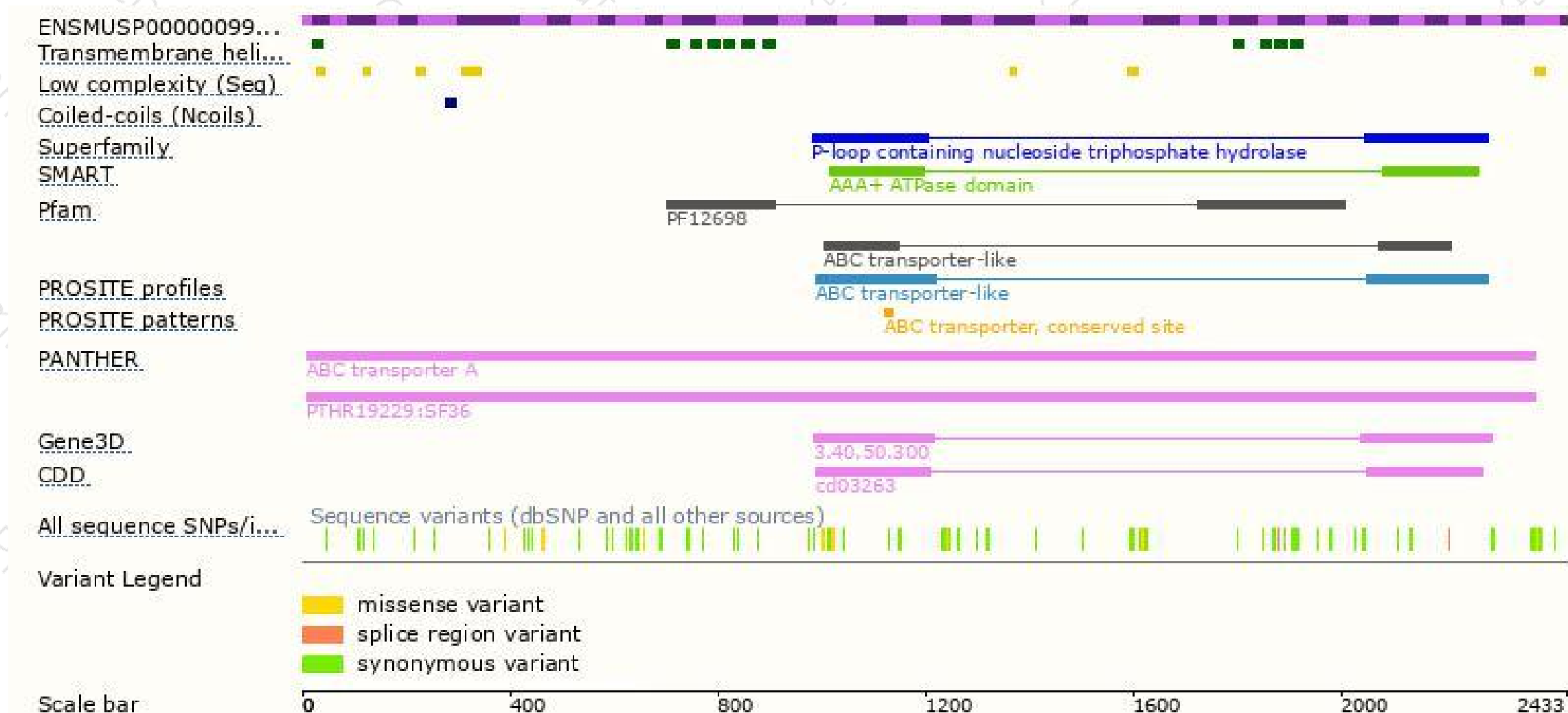
The strategy is based on the design of *Abca2-201* transcript,The transcription is shown below



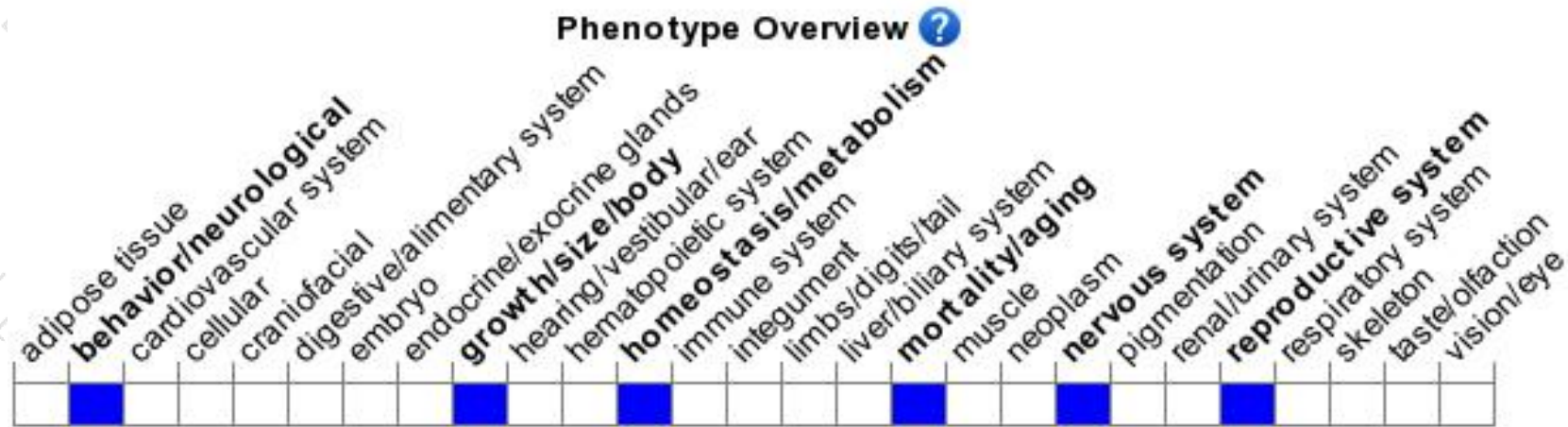
Genomic location distribution



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, Null mice show tremors, hyperactivity, abnormal coordination, and alterations in CNS myelin sheath ultrastructure,

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

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