Atxn2 Cas9-CKO Strategy

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Design Date: 2019-9-19
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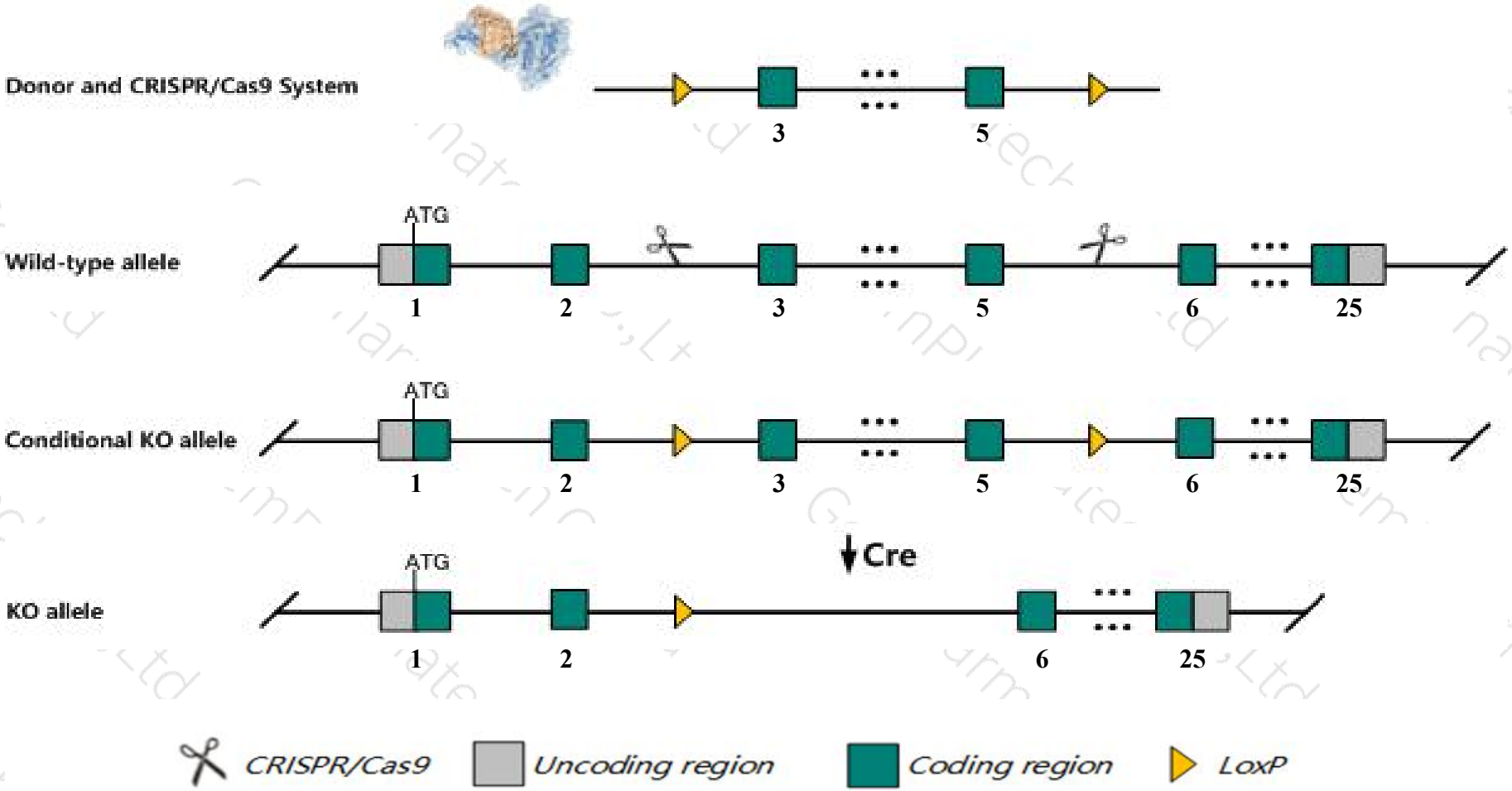
Project Overview

Project Name	***Atxn2***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Atxn2* gene. The schematic diagram is as follows:



Technical routes

- The *Atxn2* gene has 20 transcripts. According to the structure of *Atxn2* gene, exon3-exon5 of *Atxn2-201* (ENSMUST00000051950.13) transcript is recommended as the knockout region.The region contains 283bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Atxn2* 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.

Notice

- According to the existing MGI data,Homozygous mice exhibit an enlarged fat pad, hepatic steatosis and enlarged seminal vesicles. A mild defect in motor learning is seen, but no other notable behavioral or neurological defects are detectable.

- The *Atxn2* 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）

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Atxn2 ataxin 2 [Mus musculus (house mouse)]

Gene ID: 20239, updated on 31-Jan-2019

Summary

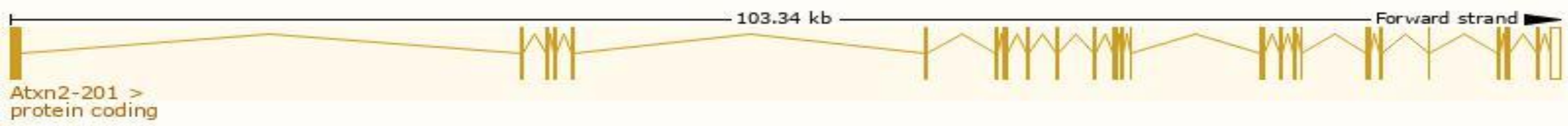
Official Symbol	Atxn2 provided by MGI
Official Full Name	ataxin 2 provided by MGI
Primary source	MGI:MGI:1277223
See related	Ensembl:ENSMUSG00000042605
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	9630045M23Rik, ATX2, AW544490, Sca2
Expression	Ubiquitous expression in adrenal adult (RPKM 15.1), testis adult (RPKM 13.0) and 28 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

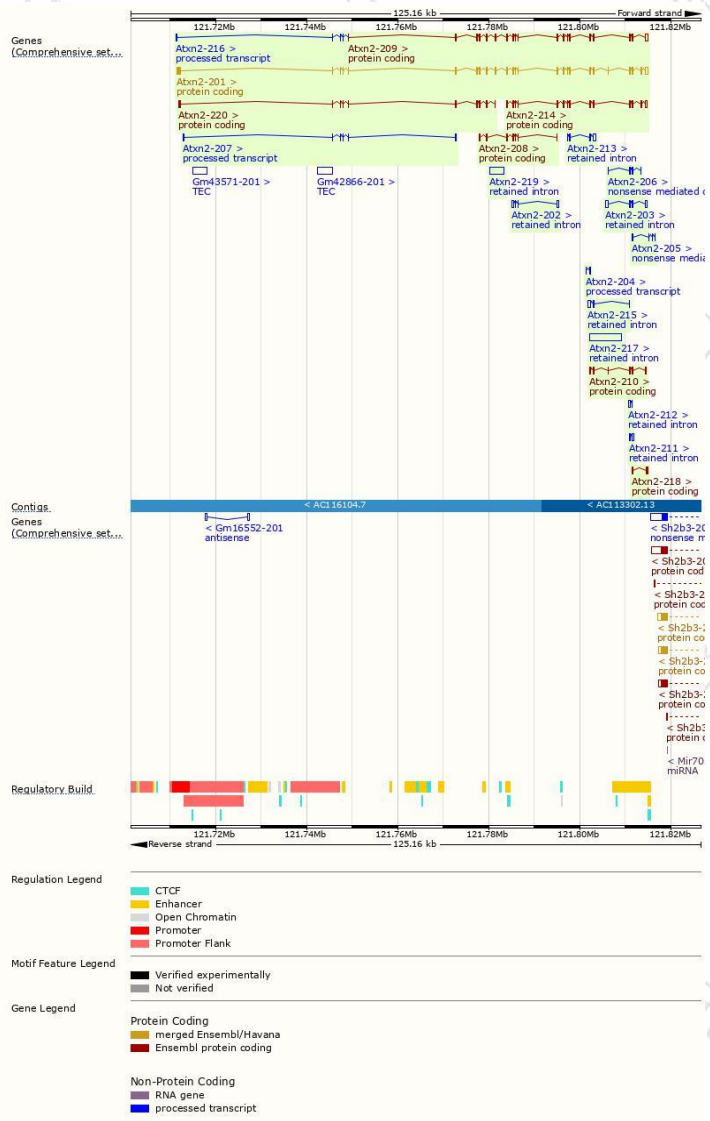
The gene has 20 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Atxn2-201	ENSMUST00000051950.13	4472	1286aa	Protein coding	CCDS39250	E9QM77	TSL:1 GENCODE basic APPRIS P1
Atxn2-209	ENSMUST00000161064.7	3294	929aa	Protein coding	-	F6U2C2	CDS 5' incomplete TSL:5
Atxn2-214	ENSMUST00000162327.7	2343	662aa	Protein coding	-	F6V8M6	CDS 5' incomplete TSL:5
Atxn2-220	ENSMUST00000225761.1	1434	402aa	Protein coding	-	A0A286YDU2	CDS 3' incomplete
Atxn2-208	ENSMUST00000160821.5	990	330aa	Protein coding	-	F7B6X4	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
Atxn2-210	ENSMUST00000161159.7	891	234aa	Protein coding	-	F6UTV7	CDS 5' incomplete TSL:3
Atxn2-218	ENSMUST00000199864.1	412	64aa	Protein coding	-	A0A0G2JF15	CDS 5' incomplete TSL:3
Atxn2-206	ENSMUST00000160462.1	397	65aa	Nonsense mediated decay	-	F6U209	CDS 5' incomplete TSL:5
Atxn2-205	ENSMUST00000160220.1	388	96aa	Nonsense mediated decay	-	F6U2Q5	CDS 5' incomplete TSL:3
Atxn2-207	ENSMUST00000160813.1	497	No protein	Processed transcript	-	-	TSL:3
Atxn2-216	ENSMUST00000162611.7	461	No protein	Processed transcript	-	-	TSL:3
Atxn2-204	ENSMUST00000160093.1	240	No protein	Processed transcript	-	-	TSL:3
Atxn2-217	ENSMUST00000199451.1	6946	No protein	Retained intron	-	-	TSL:NA
Atxn2-219	ENSMUST00000200499.1	3131	No protein	Retained intron	-	-	TSL:NA
Atxn2-203	ENSMUST00000159928.1	1468	No protein	Retained intron	-	-	TSL:5
Atxn2-202	ENSMUST00000159828.1	1003	No protein	Retained intron	-	-	TSL:2
Atxn2-213	ENSMUST00000161872.7	755	No protein	Retained intron	-	-	TSL:5
Atxn2-215	ENSMUST00000162459.1	754	No protein	Retained intron	-	-	TSL:3
Atxn2-211	ENSMUST00000161433.1	578	No protein	Retained intron	-	-	TSL:2
Atxn2-212	ENSMUST00000161836.1	482	No protein	Retained intron	-	-	TSL:2

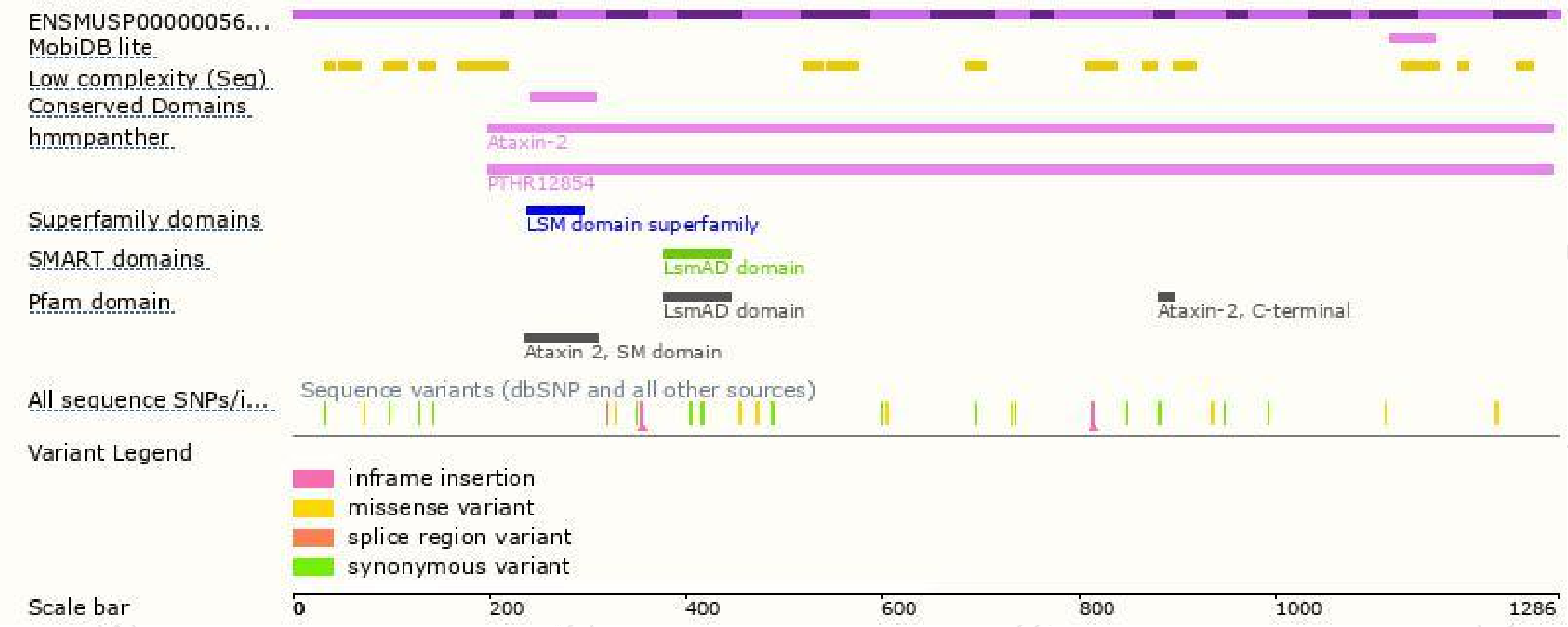
The strategy is based on the design of *Atxn2-201* transcript,The transcription is shown below



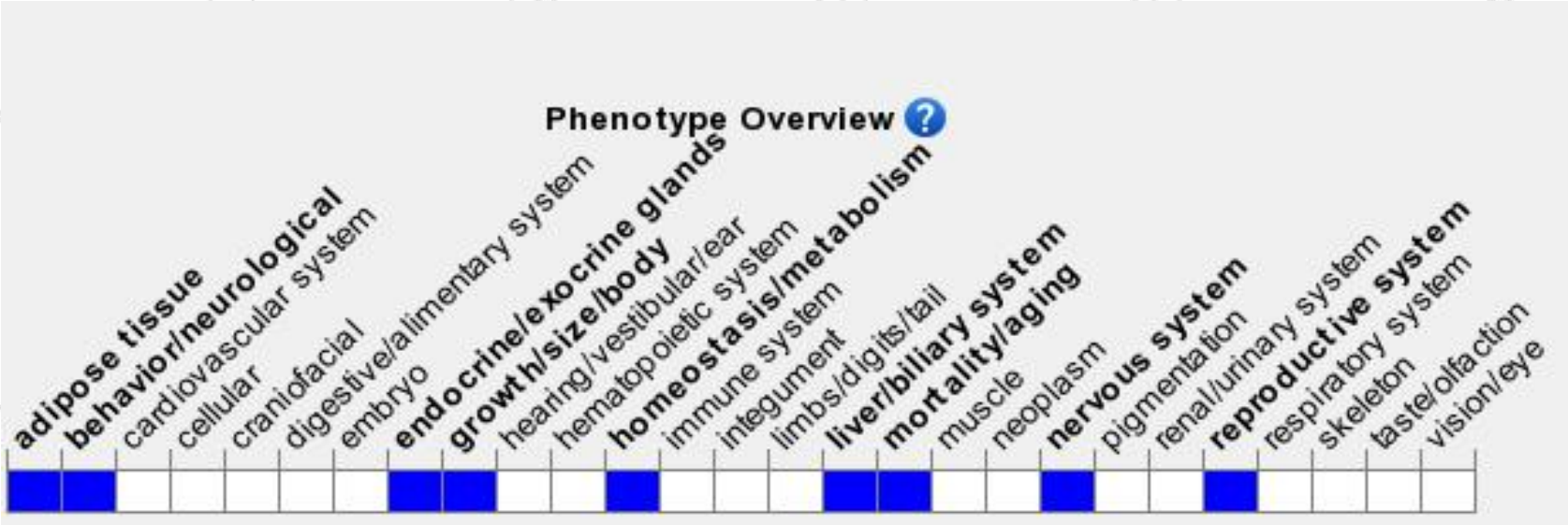
Genomic location distribution



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/).

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

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