Atm Cas9-CKO Strategy

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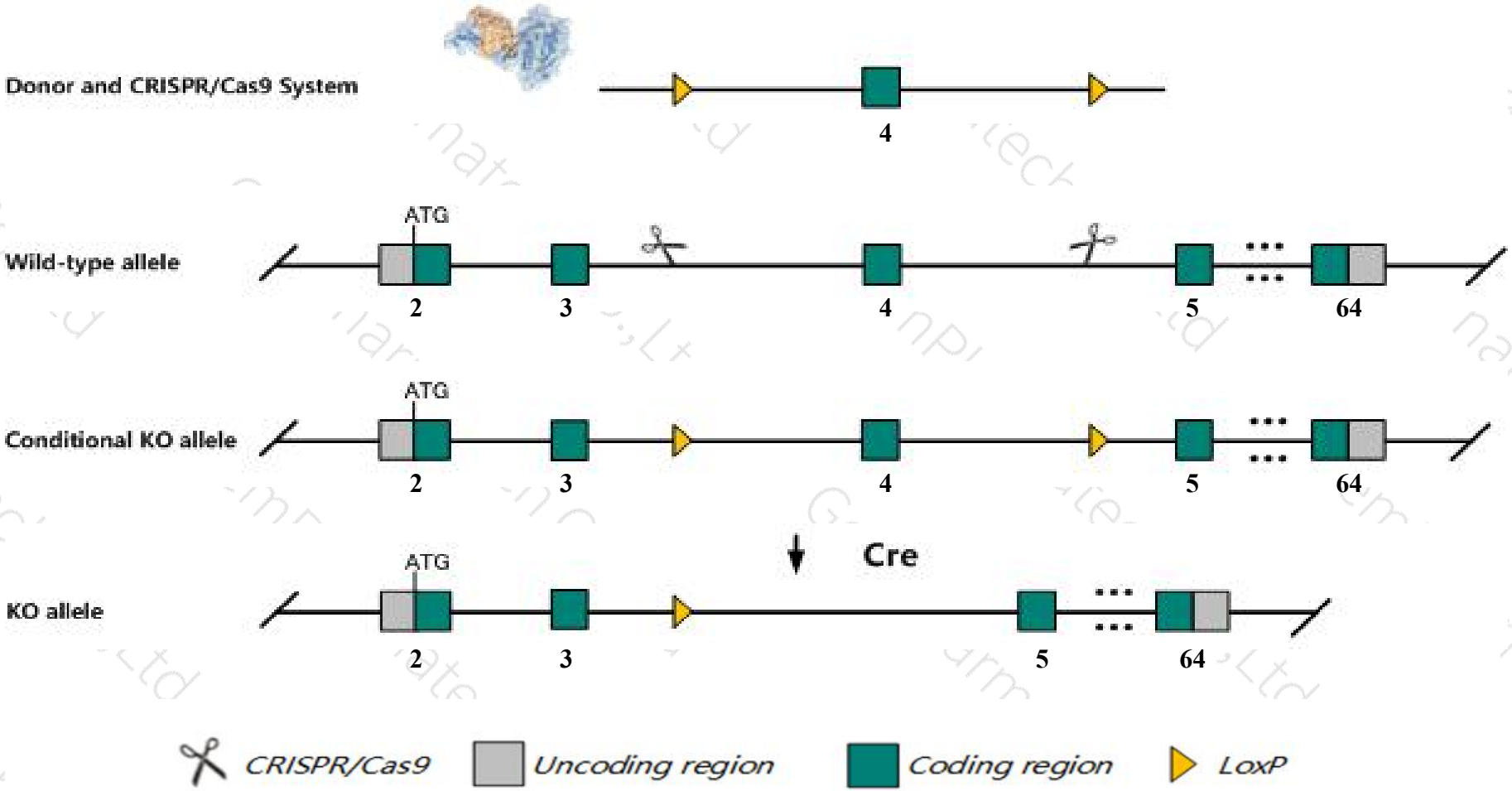
Design Date: 2019-8-6

Project Overview

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

Conditional Knockout strategy

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



Technical routes

- The *Atm* gene has 6 transcripts. According to the structure of *Atm* gene, exon4 of *Atm-206* (ENSMUST00000232179.1) transcript is recommended as the knockout region.The region contains 146bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Atm* 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,Homozygotes for null mutations may exhibit locomotor abnormalities, motor learning deficits, growth retardation, sterility due to meiotic arrest, and susceptibility to thymic lymphomas. Mice homozygous for a kinase dead allele exhibit early embryonic lethality associated with genetic instability.

- The *Atm* gene is located on the Chr9. 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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Atm ataxia telangiectasia mutated [Mus musculus (house mouse)]

Gene ID: 11920, updated on 2-Apr-2019

Summary

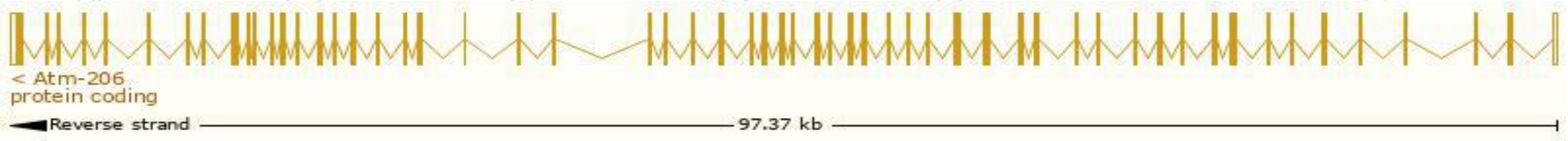
Official Symbol	Atm provided by MGI
Official Full Name	ataxia telangiectasia mutated provided byMGI
Primary source	MGI:MGI:107202
See related	Ensembl:ENSMUSG00000034218
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	AI256621, C030026E19Rik
Expression	Ubiquitous expression in CNS E11.5 (RPKM 3.8), CNS E14 (RPKM 2.7) and 24 other tissuesSee more
Orthologs	human all

Transcript information（Ensembl）

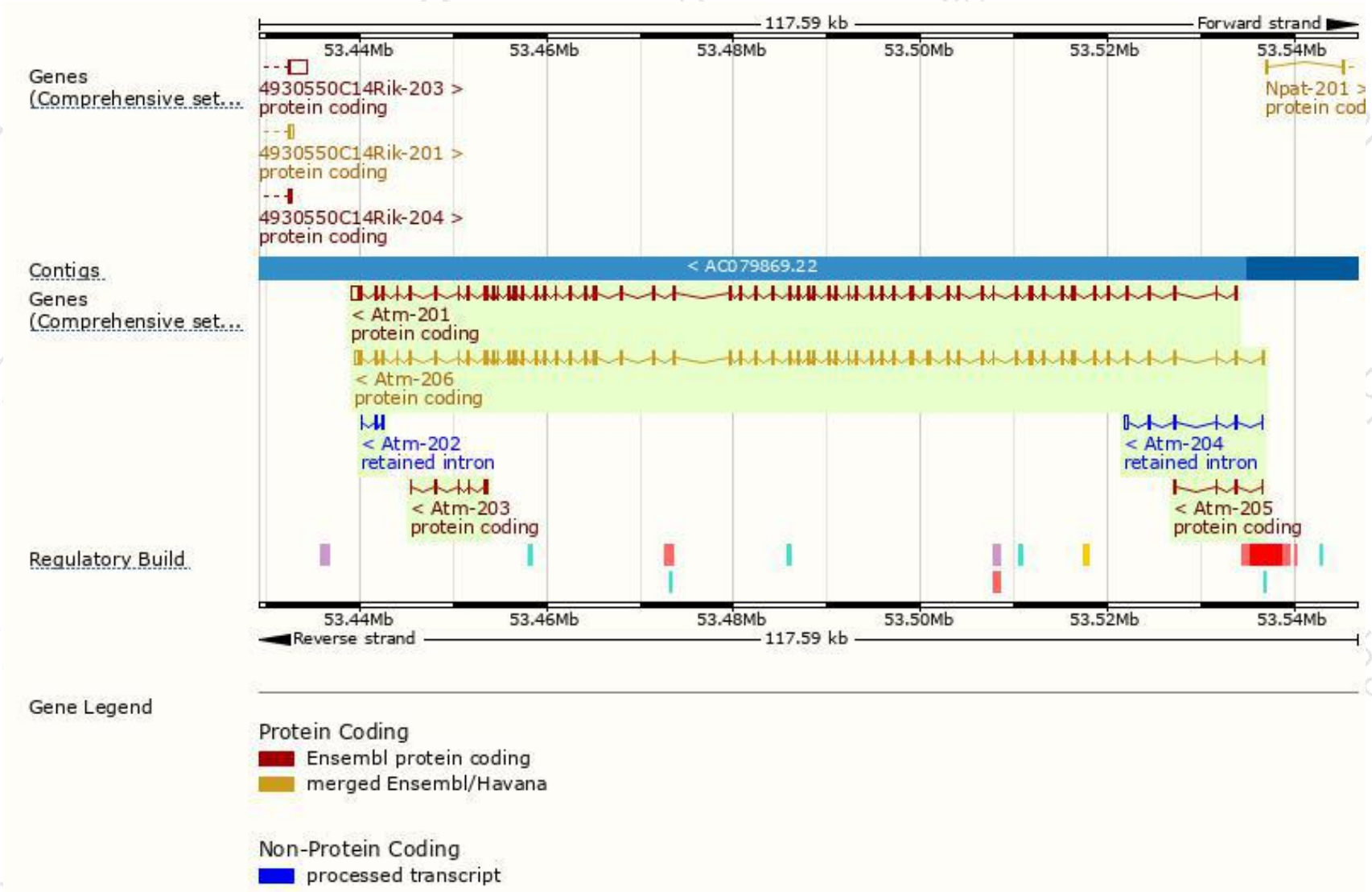
The gene has 6 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Atm-206	ENSMUST00000232179.1	9787	3066aa	Protein coding	CCDS40636	Q62388	GENCODE basic APPRIS P2
Atm-201	ENSMUST00000118282.8	9819	3063aa	Protein coding	-	B9EHX4	TSL:5 GENCODE basic APPRIS ALT2
Atm-205	ENSMUST00000150244.1	643	140aa	Protein coding	-	D3Z0Q2	CDS 3' incomplete TSL:5
Atm-203	ENSMUST00000132249.1	602	201aa	Protein coding	-	F6UXV2	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
Atm-204	ENSMUST00000132403.1	1243	No protein	Retained intron	-	-	TSL:1
Atm-202	ENSMUST00000126598.1	281	No protein	Retained intron	-	-	TSL:3

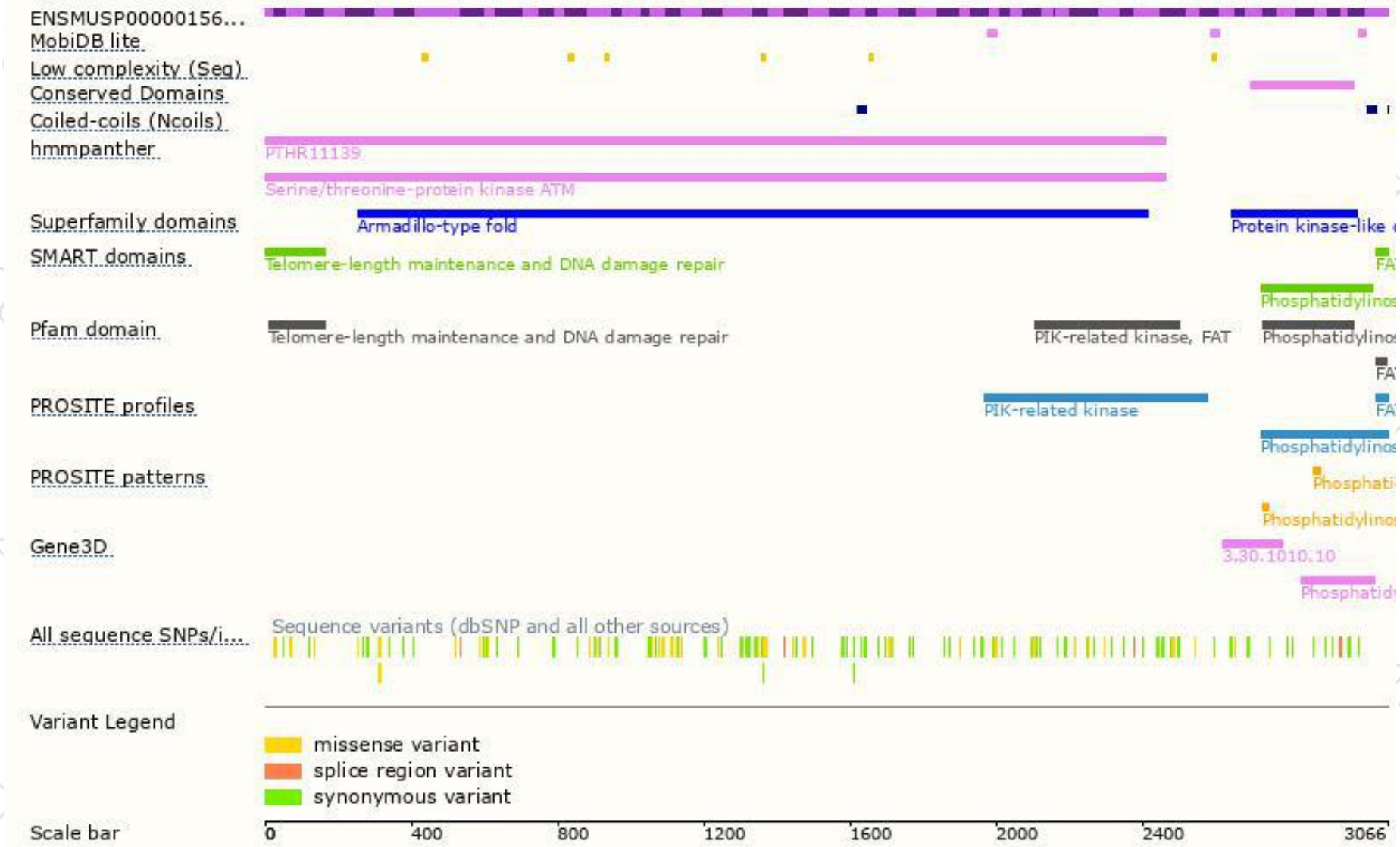
The strategy is based on the design of *Atm-206* transcript,The transcription is shown below



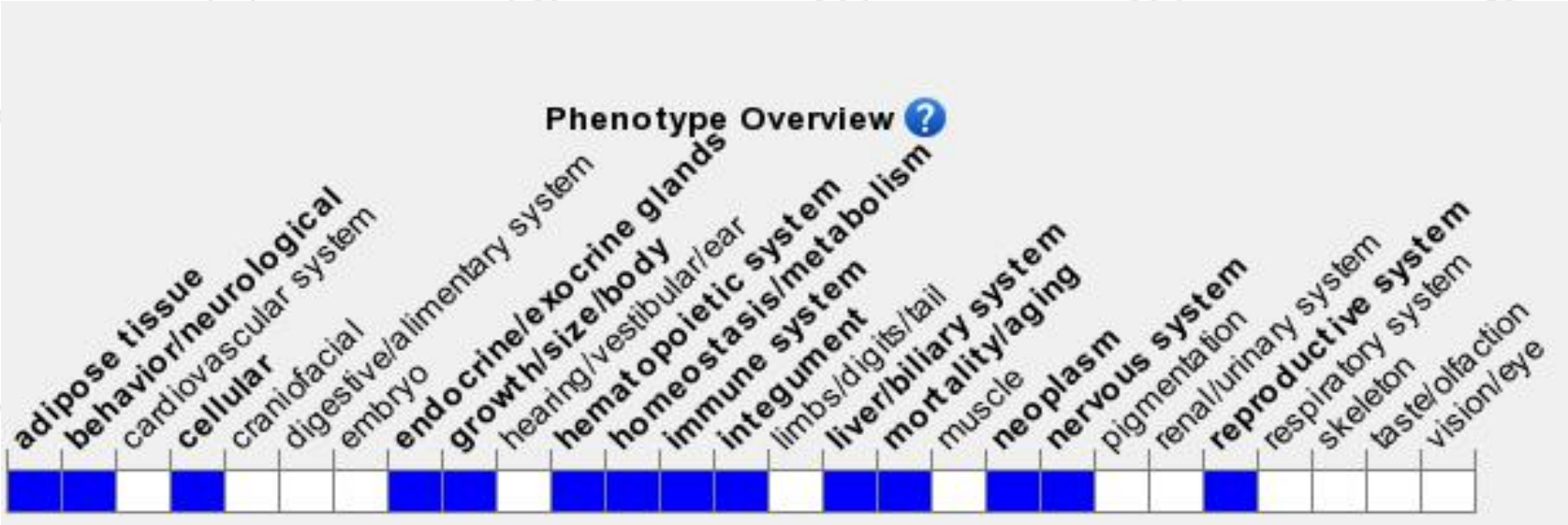
Genomic location distribution



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/).

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

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