Abcb1b Cas9-CKO Strategy

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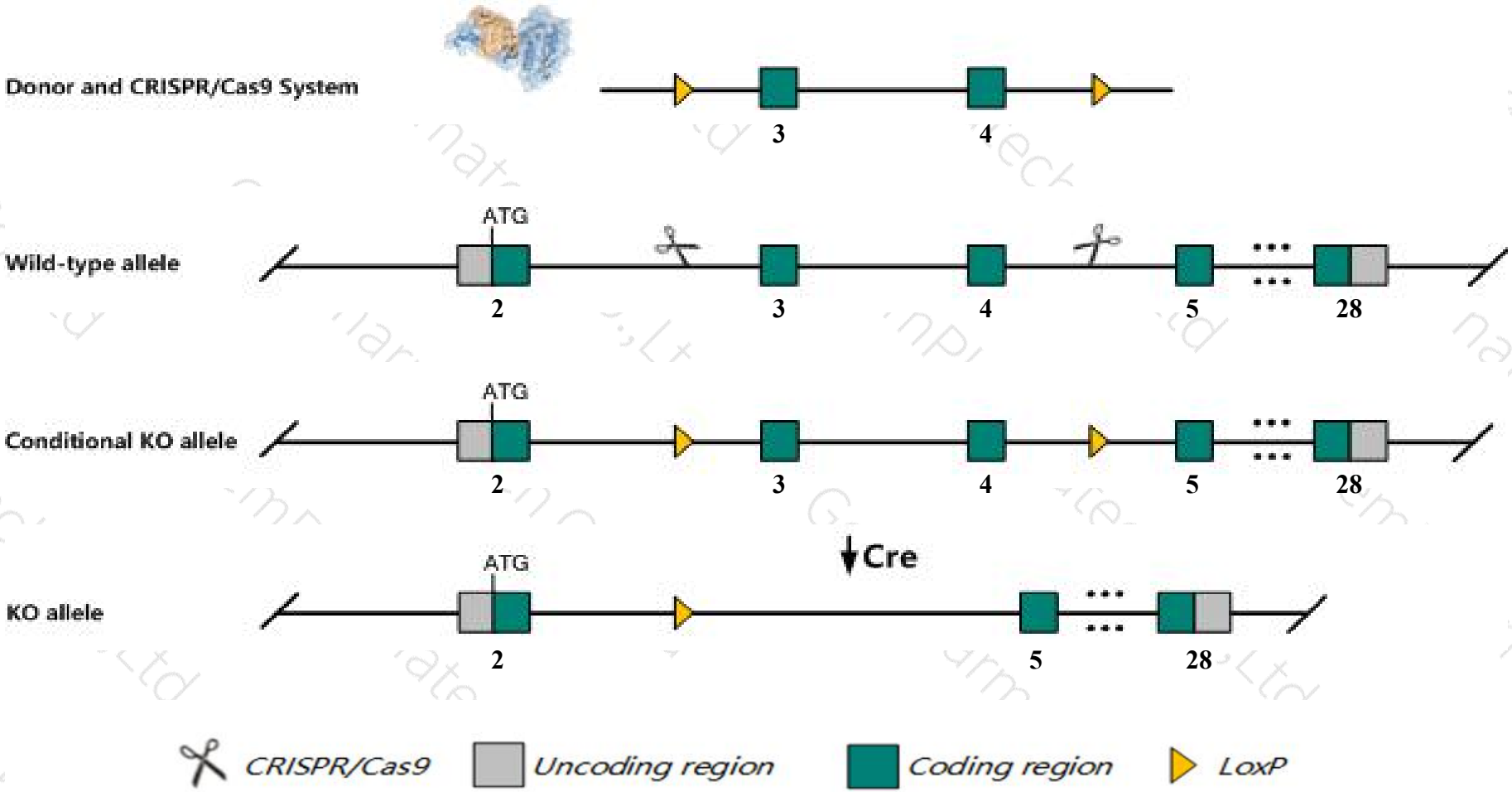
Project Overview

Project Name	***Abcb1b***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Abcb1b* gene. The schematic diagram is as follows:



Technical routes

- The *Abcb1b* gene has 9 transcripts. According to the structure of *Abcb1b* gene, exon3-exon4 of *Abcb1b-201* (ENSMUST00000009058.9) transcript is recommended as the knockout region.The region contains 212bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Abcb1b* 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,Mice homozygous for targeted mutations that inactivate the gene are hypersensitive to effects of drugs transported by phosphoglycoproteins.

- The *Abcb1b* 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）

集萃药康 GemPharmatech

Abcb1b ATP-binding cassette, sub-family B (MDR/TAP), member 1B [Mus musculus (house mouse)]

Gene ID: 18669, updated on 2-Apr-2019

Summary

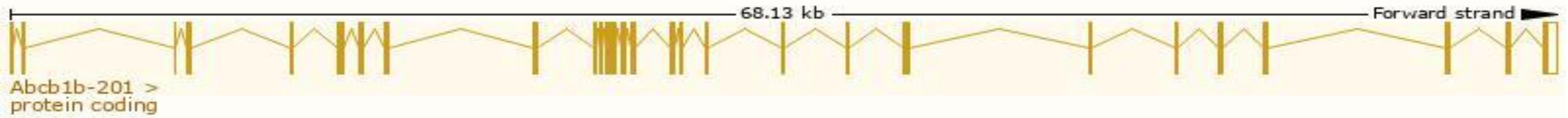
Official Symbol	Abcb1b provided by MGI
Official Full Name	ATP-binding cassette, sub-family B (MDR/TAP), member 1B provided by MGI
Primary source	MGI:MGI:97568
See related	Ensembl:ENSMUSG00000028970
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Abcb1, Mdr1, Mdr1b, Pgy-1, Pgy1, mdr
Summary	The membrane-associated protein encoded by this gene is a member of the superfamily of ATP-binding cassette (ABC) transporters. ABC proteins transport various molecules across extra- and intra-cellular membranes. ABC genes are divided into seven distinct subfamilies (ABC1, MDR/TAP, MRP, ALD, OABP, GCN20, White). This protein is a member of the MDR/TAP subfamily. Members of the MDR/TAP subfamily are involved in multidrug resistance. This gene encodes a membrane glycoprotein which confers a multidrug-resistance phenotype. The protein encoded by the human gene is an ATP-dependent drug efflux pump for xenobiotic compounds which is responsible for decreased drug accumulation in multidrug-resistant cells and mediates the development of resistance to anticancer drugs. [provided by RefSeq, Jul 2008]
Expression	Biased expression in adrenal adult (RPKM 39.4), placenta adult (RPKM 7.7) and 4 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

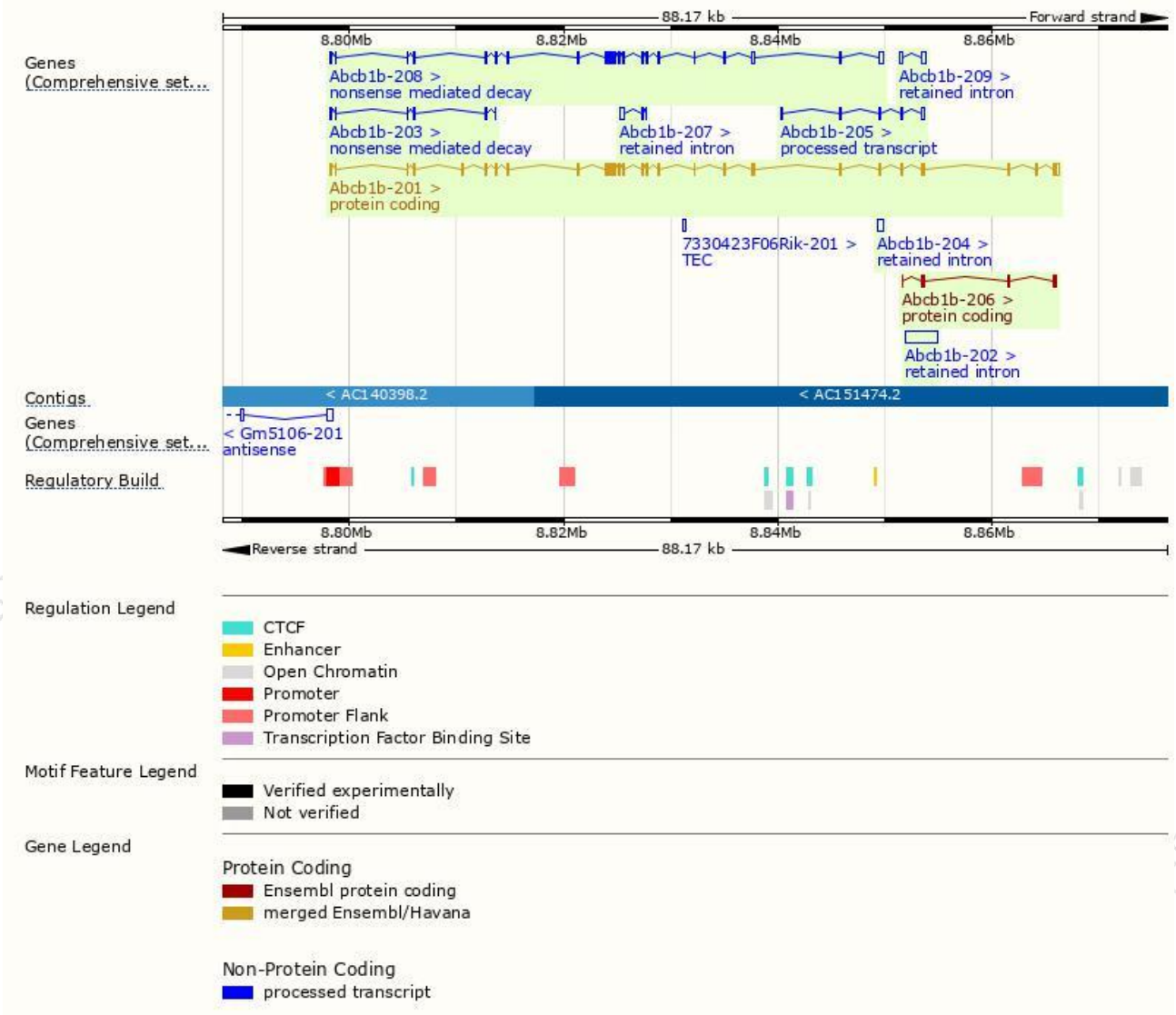
The gene has 9 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Abcb1b-201	ENSMUST00000009058.9	4306	1276aa	Protein coding	CCDS19085	B2RUR3 P06795	TSL:1 GENCODE basic APPRIS P1
Abcb1b-202	ENSMUST00000196048.1	3026	No protein	Retained intron	-	-	TSL:NA
Abcb1b-203	ENSMUST00000196580.4	690	106aa	Nonsense mediated decay	-	A0A0G2JGL4	TSL:3
Abcb1b-204	ENSMUST00000196819.1	489	No protein	Retained intron	-	-	TSL:NA
Abcb1b-205	ENSMUST00000197961.1	735	No protein	lncRNA	-	-	TSL:2
Abcb1b-206	ENSMUST00000198650.1	613	205aa	Protein coding	-	A0A0G2JF49	CDS 5' and 3' incomplete TSL:5
Abcb1b-207	ENSMUST00000199546.1	654	No protein	Retained intron	-	-	TSL:2
Abcb1b-208	ENSMUST00000199955.4	3181	106aa	Nonsense mediated decay	-	A0A0G2JGL4	TSL:1
Abcb1b-209	ENSMUST00000199994.1	584	No protein	Retained intron	-	-	TSL:2

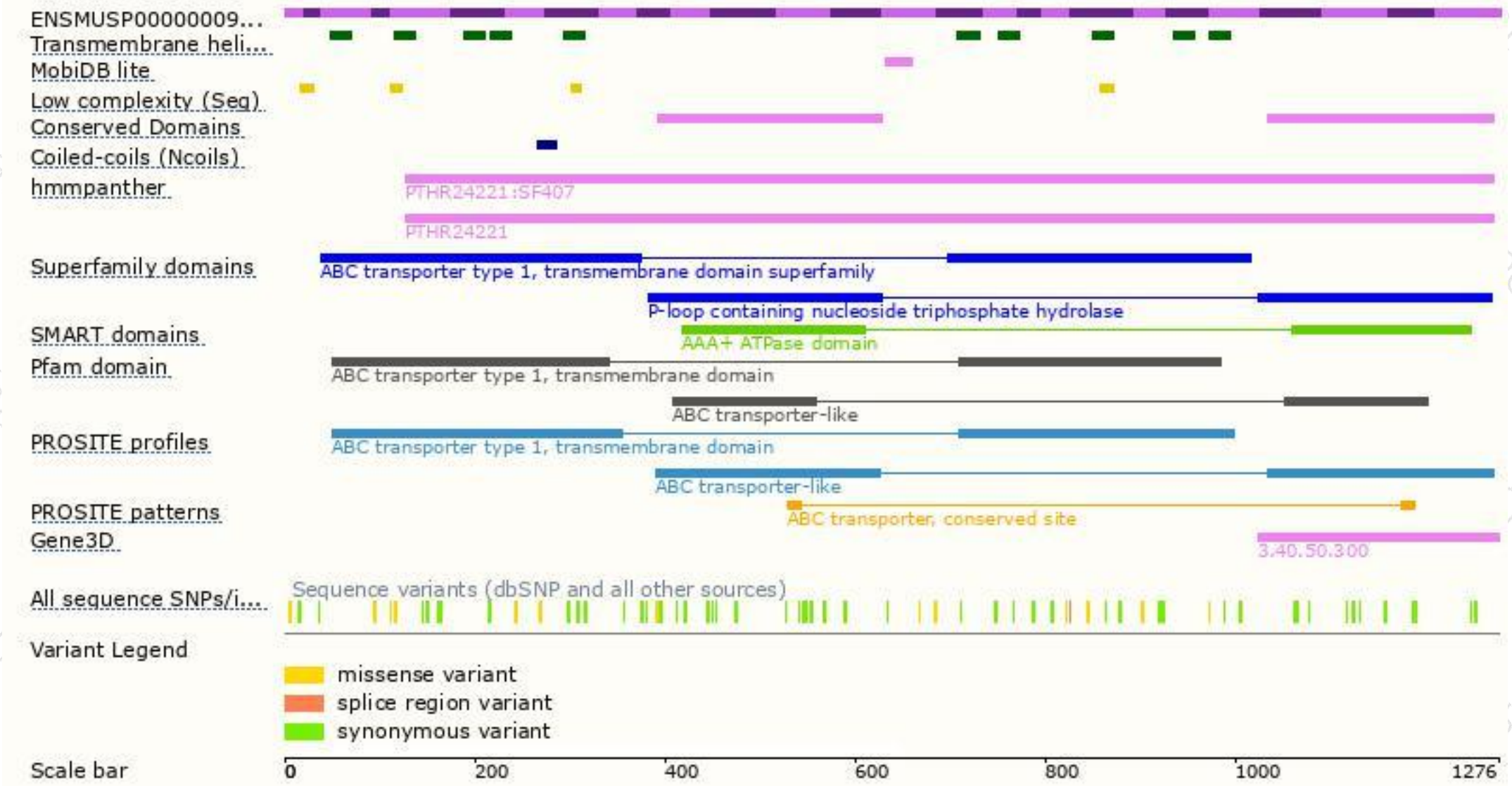
The strategy is based on the design of *Abcb1b-201* transcript,The transcription is shown below



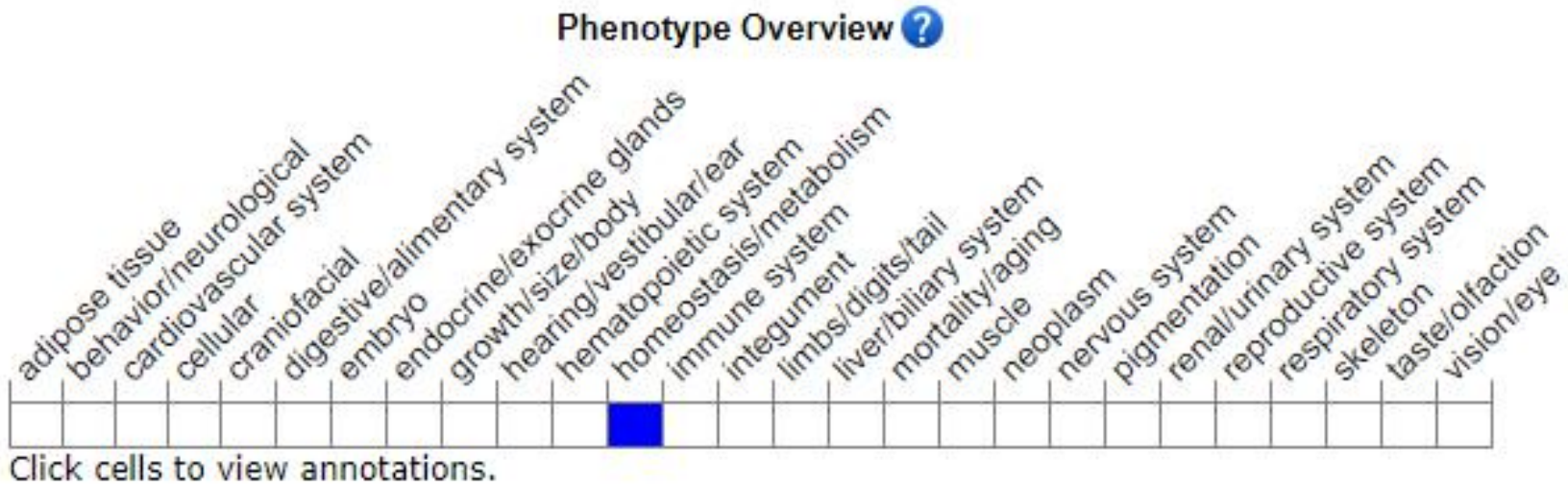
Genomic location distribution



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 targeted mutations that inactivate the gene are hypersensitive to effects of drugs transported by phosphoglycoproteins.

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

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