

Itga3 Cas9-CKO Strategy

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Project Overview

Project Name

Itga3

Project type

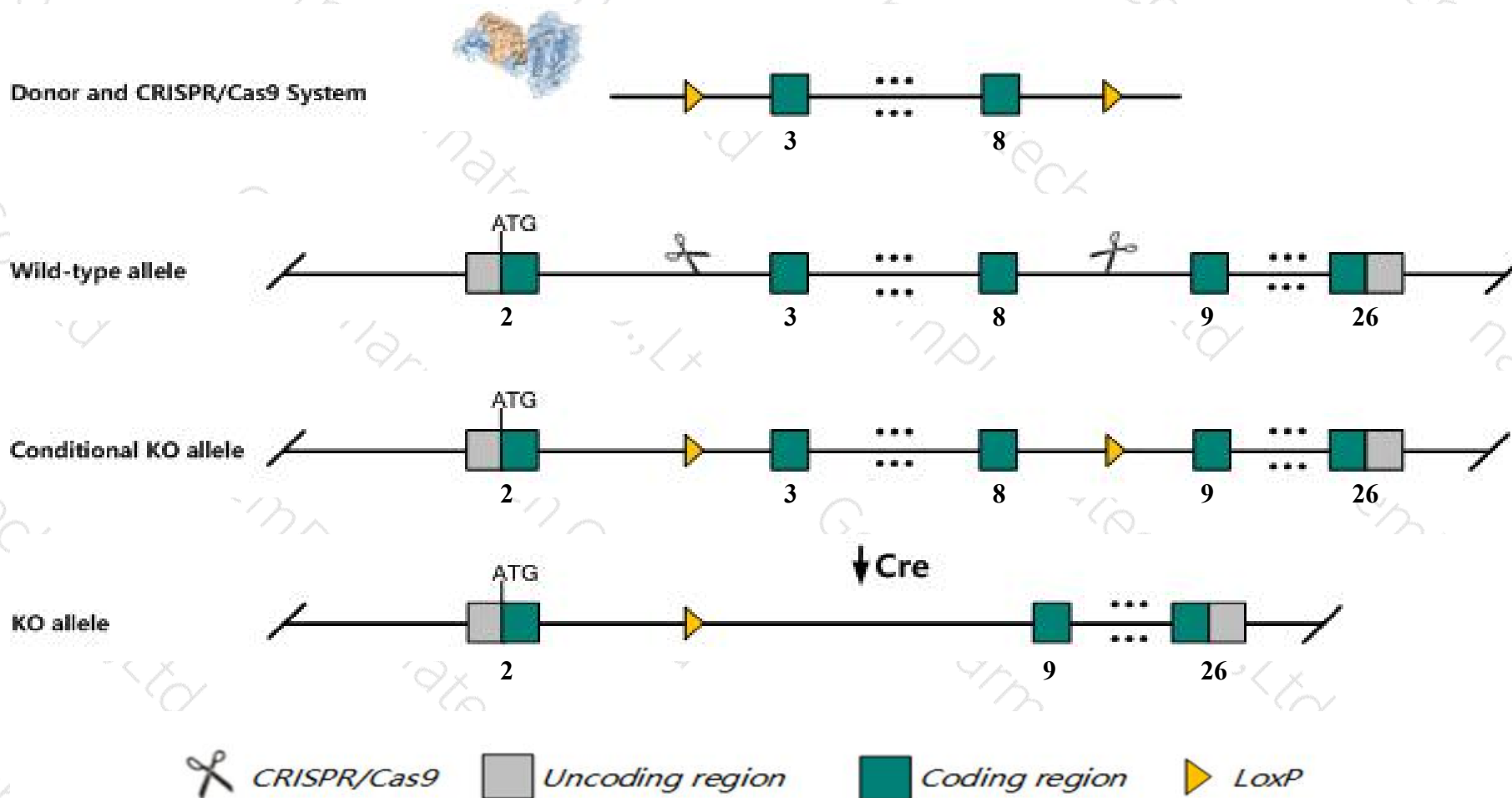
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Itga3* gene. The schematic diagram is as follows:



- The *Itga3* gene has 6 transcripts. According to the structure of *Itga3* gene, exon3-exon8 of *Itga3-203* (ENSMUST00000120375.7) transcript is recommended as the knockout region. The region contains 953bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Itga3* 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, Homozygotes for a targeted null mutation exhibit defects of the kidney and submandibular gland, decreased bronchial branching of the lungs, skin blisters at the dermal-epidermal junction, abnormal layering of the cerebral cortex and perinatal lethality.
- The *Itga3* gene is located on the Chr11. 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)

Itga3 integrin alpha 3 [*Mus musculus* (house mouse)]

Gene ID: 16400, updated on 12-Aug-2019

Summary

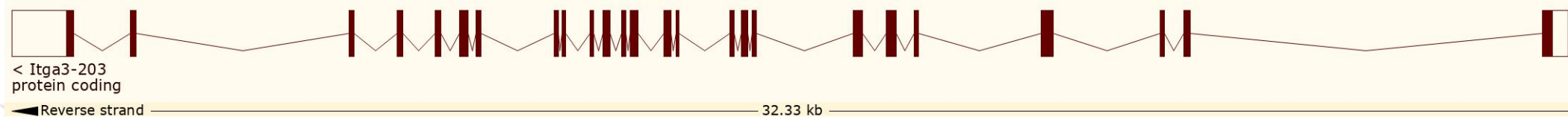
Official Symbol	Itga3 provided by MGI
Official Full Name	integrin alpha 3 provided by MGI
Primary source	MGI:MGI:96602
See related	Ensembl:ENSMUSG000000001507
Gene type	protein coding
RefSeq status	REVIEWED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	CD49C; GAPB3; AA407068
Summary	This gene encodes a subunit of integrin family of cell surface proteins. The encoded protein undergoes post-translational processing to form a disulfide bond-linked dimer comprised of heavy and light chains. At the cell surface, the encoded protein non-covalently associates with the integrin beta-1 subunit to form a heterodimer that interacts with many extracellular matrix proteins including fibronectin and laminin. Mice lacking the encoded protein die during the first day after birth due to severe abnormalities in kidneys. Mice lacking the encoded protein specifically in the basal layer of epidermis display several skin defects and accelerated wound healing. Alternative splicing results in multiple transcript variants encoding different isoforms. [provided by RefSeq, Apr 2015]
Expression	Broad expression in lung adult (RPKM 73.3), duodenum adult (RPKM 44.4) and 20 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

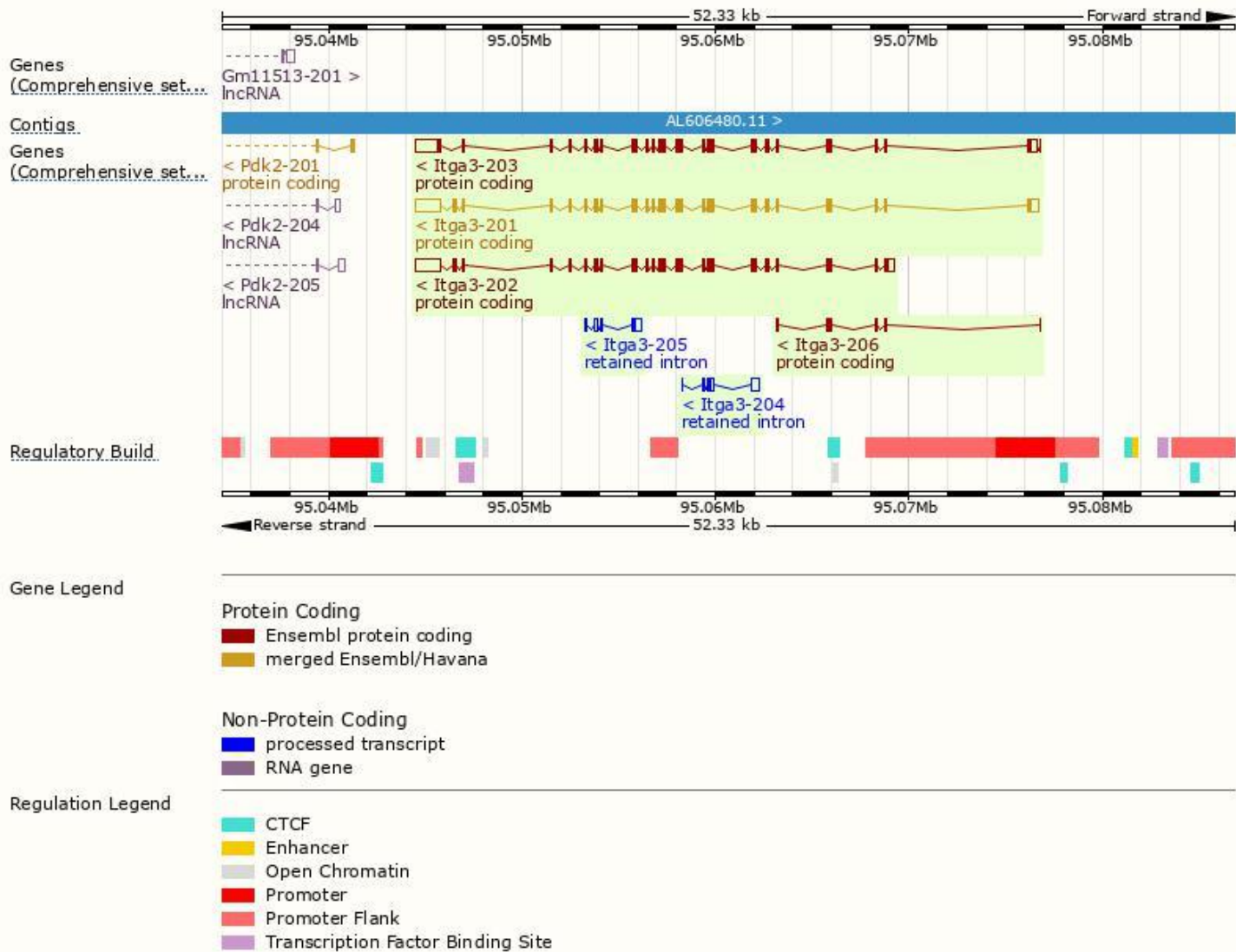
The gene has 6 transcripts, all transcripts are shown below:

Name ▲	Transcript ID ▲	bp ▲	Protein ▲	Biotype ▲	CCDS ▲	UniProt ▲	Flags ▲
Itga3-201	ENSMUST00000001548.13	4861	1053aa	Protein coding	CCDS25271	Q62470	TSL:1 Gencode basic APPRIS P3
Itga3-202	ENSMUST00000107739.7	4636	1022aa	Protein coding	CCDS83877	Q62470	TSL:1 Gencode basic APPRIS ALT2
Itga3-203	ENSMUST00000120375.7	4697	1068aa	Protein coding	CCDS83878	Q62470	TSL:1 Gencode basic APPRIS ALT2
Itga3-204	ENSMUST00000140342.1	722	No protein	Retained intron	-	-	TSL:5
Itga3-205	ENSMUST00000141693.1	826	No protein	Retained intron	-	-	TSL:3
Itga3-206	ENSMUST00000145671.1	549	183aa	Protein coding	-	F6UD16	CDS 5' and 3' incomplete TSL:3

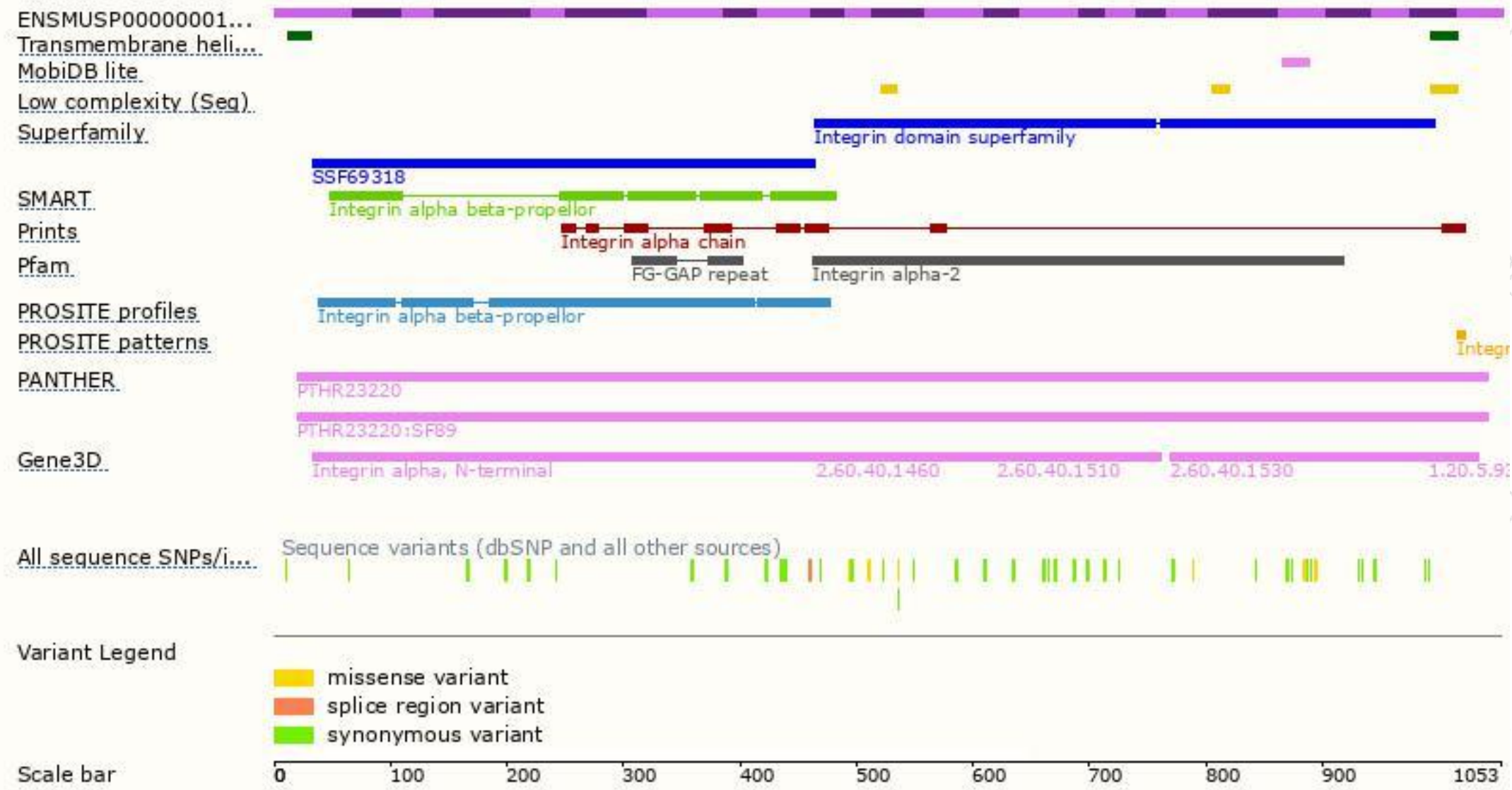
The strategy is based on the design of *Itga3-203* transcript, The transcription is shown below



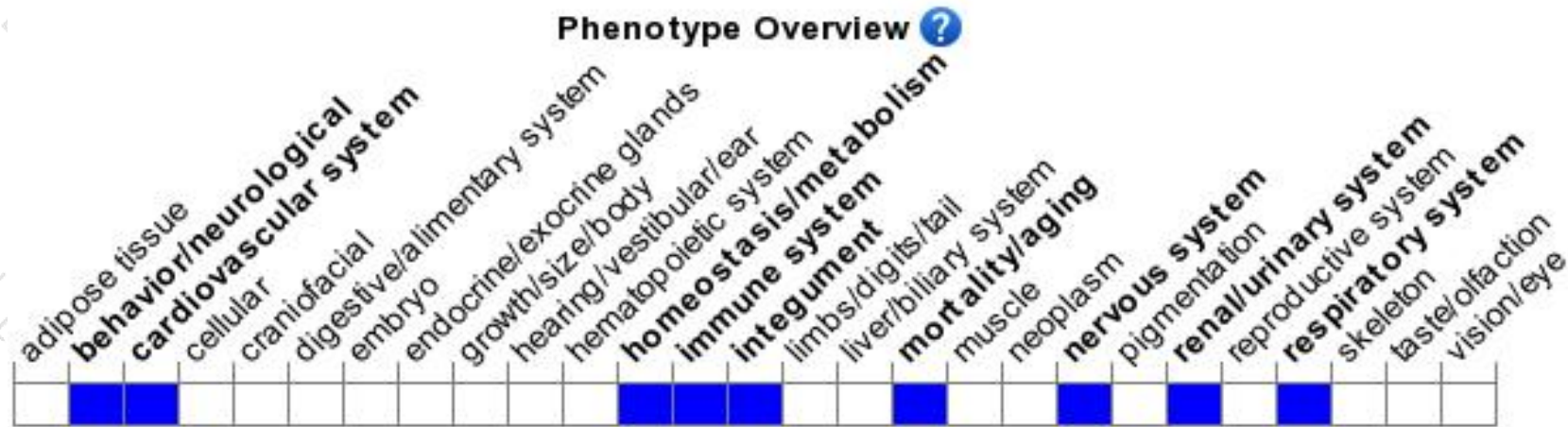
Genomic location distribution



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, Homozygotes for a targeted null mutation exhibit defects of the kidney and submandibular gland, decreased bronchial branching of the lungs, skin blisters at the dermal-epidermal junction, abnormal layering of the cerebral cortex and perinatal lethality.

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

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