

Rad21l Cas9-CKO Strategy

Designer: Yanhua Shen
Reviewer: Xueting Zhang
Design Date: 2019-08-29

Project Overview

Project Name

Rad21l

Project type

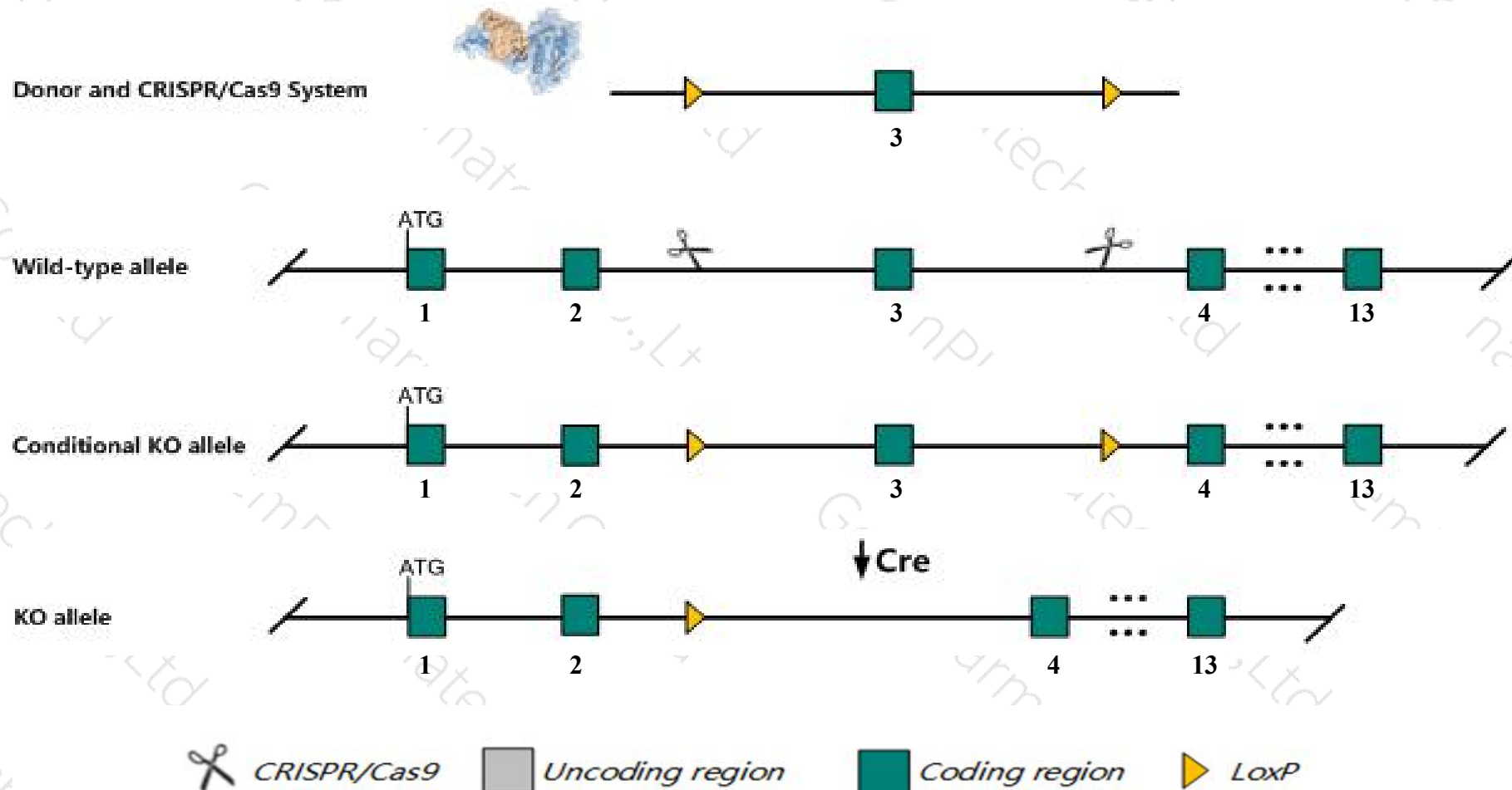
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Rad21l* gene. The schematic diagram is as follows:



- The *Rad21l* gene has 2 transcripts. According to the structure of *Rad21l* gene, exon3 of *Rad21l-202* (ENSMUST00000180195.7) 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 *Rad21l* 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, Mice homozygous for a knock-out allele exhibit male infertility and reduced female fertility associated with abnormal meiosis and synaptonemal complex.
- Some amino acids will remain at the N-terminus and some functions may be retained.
- The *Rad21l* 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)

Rad21l RAD21-like (S. pombe) [*Mus musculus* (house mouse)]

Gene ID: 668929, updated on 12-Aug-2019

Summary

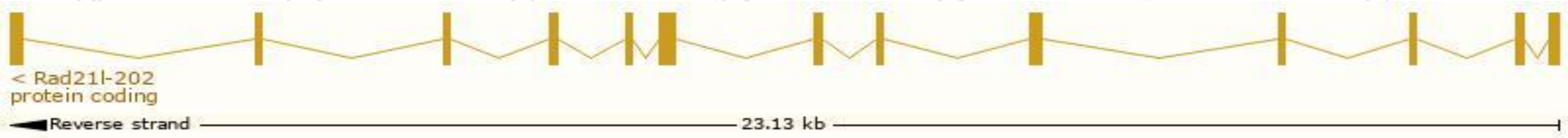
Official Symbol	Rad21l provided by MGI
Official Full Name	RAD21-like (S. pombe) provided by MGI
Primary source	MGI:MGI:3652039
See related	Ensembl:ENSMUSG00000074704
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Gm14160; Rad21l1; MeiRAD21L
Expression	Low expression observed in reference dataset See more
Orthologs	human all

Transcript information (Ensembl)

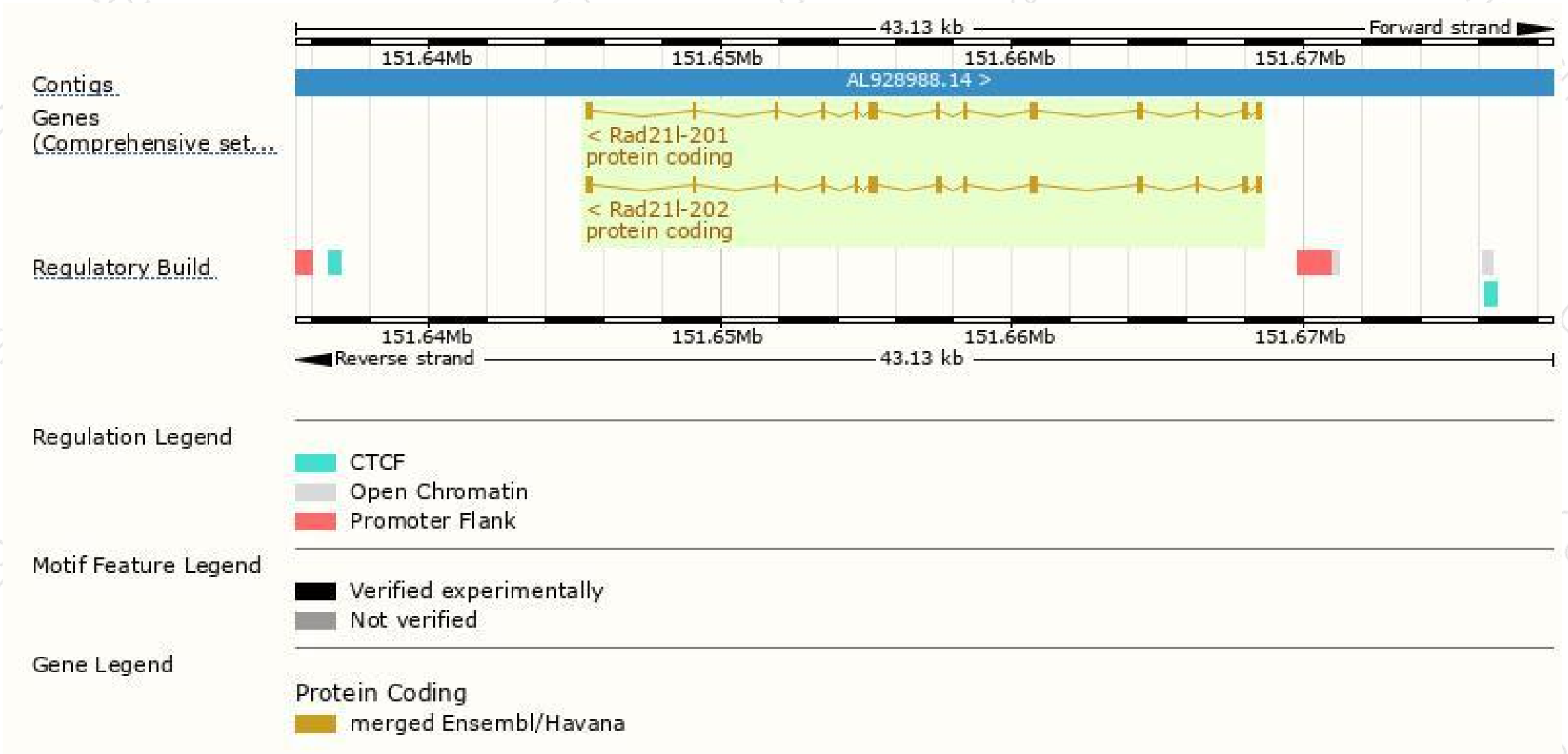
The gene has 2 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Rad21l-202	ENSMUST00000180195.7	1659	552aa	Protein coding	CCDS50747	A2AU37	TSL:1 GENCODE basic APPRIS P2
Rad21l-201	ENSMUST00000096439.3	1650	549aa	Protein coding	-	R4GML2	TSL:5 GENCODE basic APPRIS ALT2

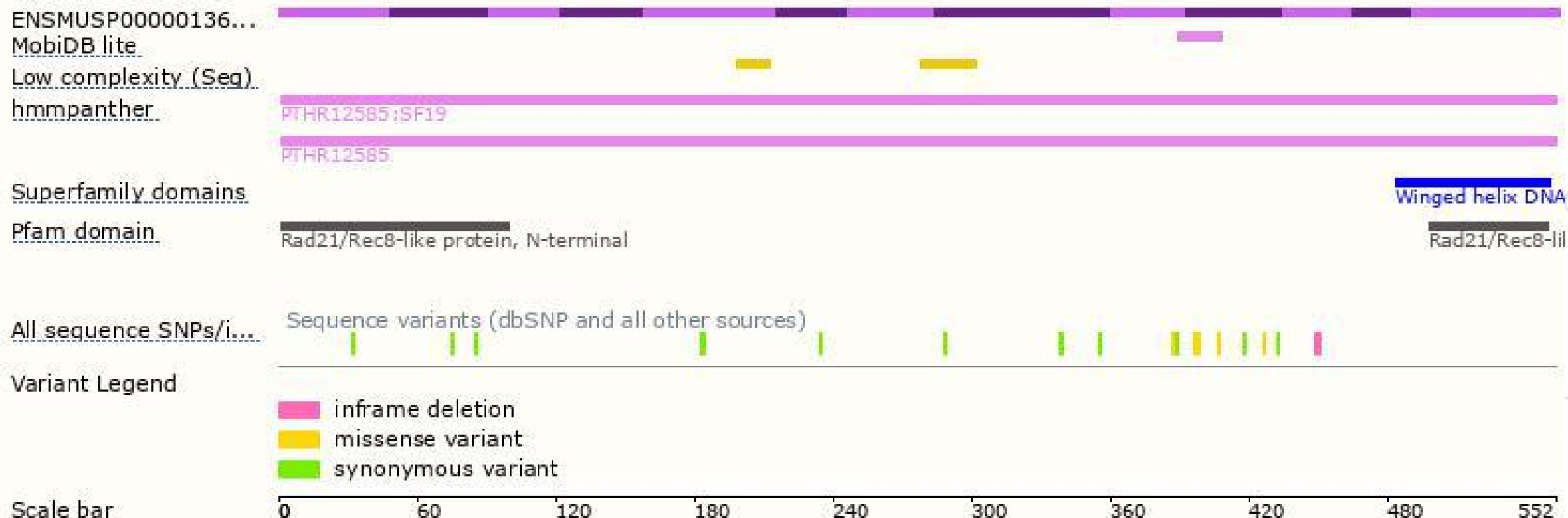
The strategy is based on the design of *Rad21l-202* transcript,The transcription is shown below



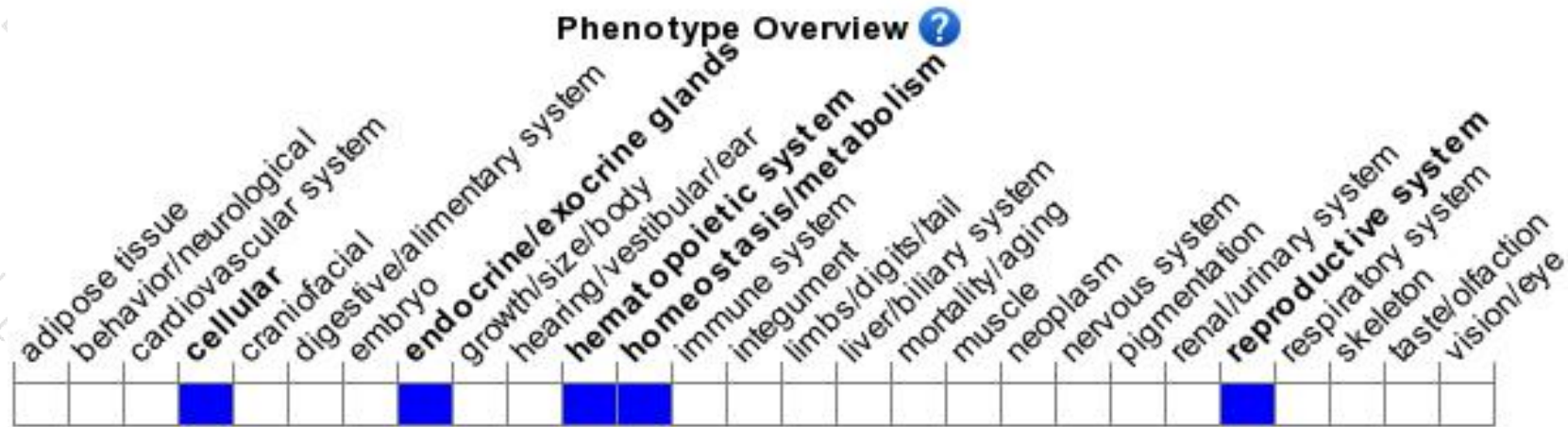
Genomic location distribution



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 a knock-out allele exhibit male infertility and reduced female fertility associated with abnormal meiosis and synaptonemal complex.

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

Tel: 400-9660890

