

Sars Cas9-CKO Strategy

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Reviewer:

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Project Overview

Project Name

Sars

Project type

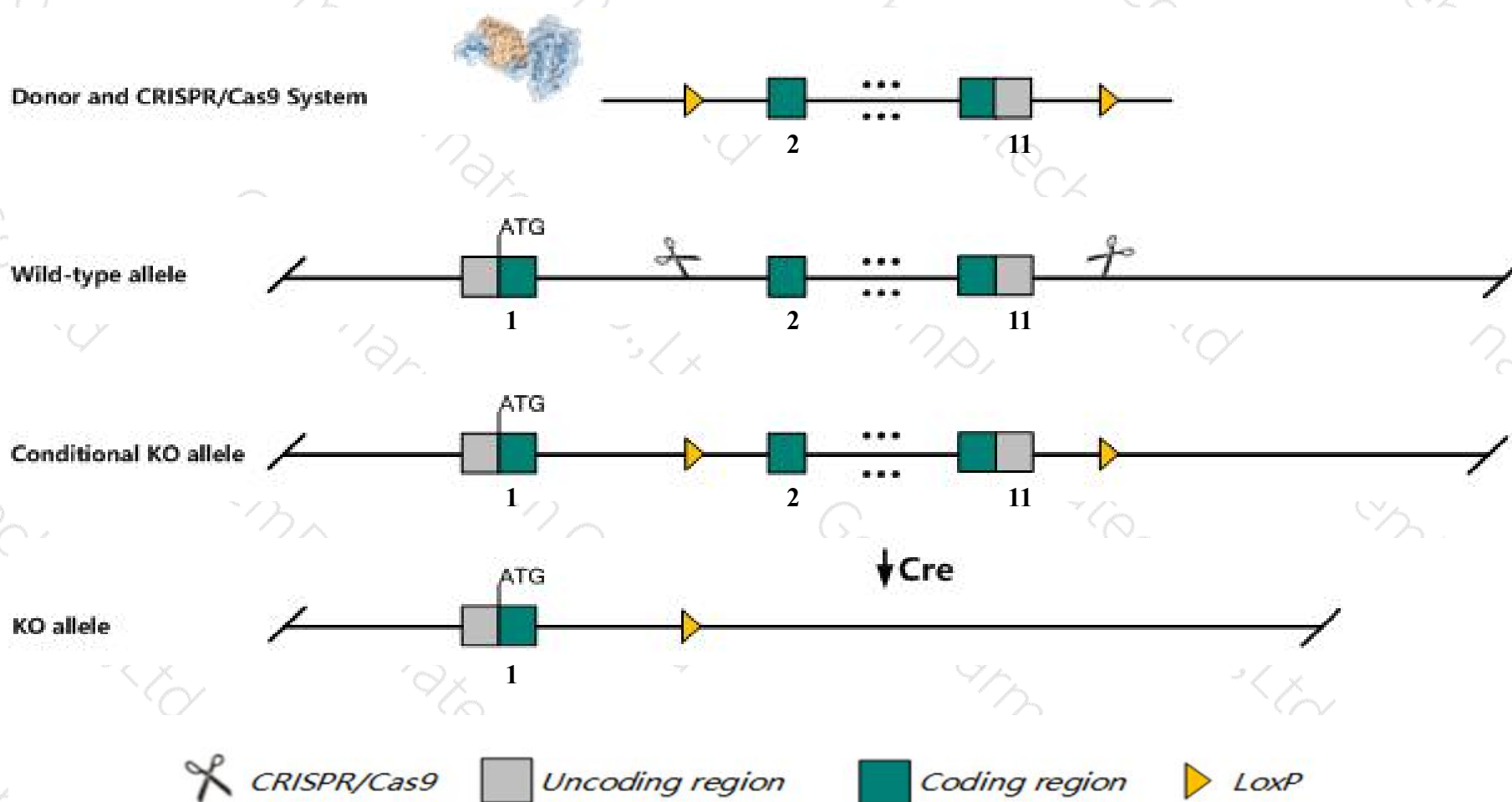
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

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



- The *Sars* gene has 5 transcripts. According to the structure of *Sars* gene, exon2-exon11 of *Sars-201* (ENSMUST00000090553.11) transcript is recommended as the knockout region. The region contains 1403bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Sars* 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 show complete embryonic lethality before implantation associated with abnormal morula morphology, increased cell death, and failure of blastocyst formation.
- The *Sars* gene is located on the Chr3. 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)

Sars seryl-aminoacyl-tRNA synthetase [Mus musculus (house mouse)]

Gene ID: 20226, updated on 31-Jan-2019

Summary



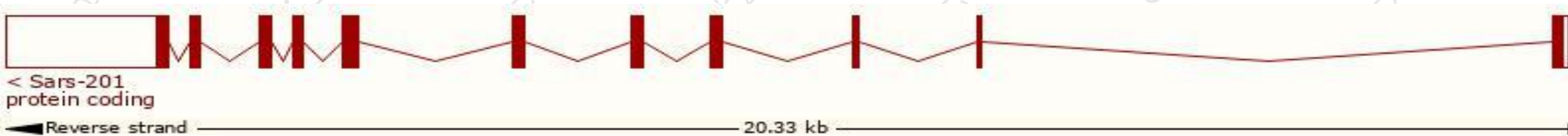
Official Symbol	Sars provided by MGI
Official Full Name	seryl-aminoacyl-tRNA synthetase provided by MGI
Primary source	MGI:MGI:102809
See related	Ensembl:ENSMUSG00000068739
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Sars1, Strs, serRS
Expression	Ubiquitous expression in CNS E14 (RPKM 31.6), CNS E11.5 (RPKM 30.2) and 28 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

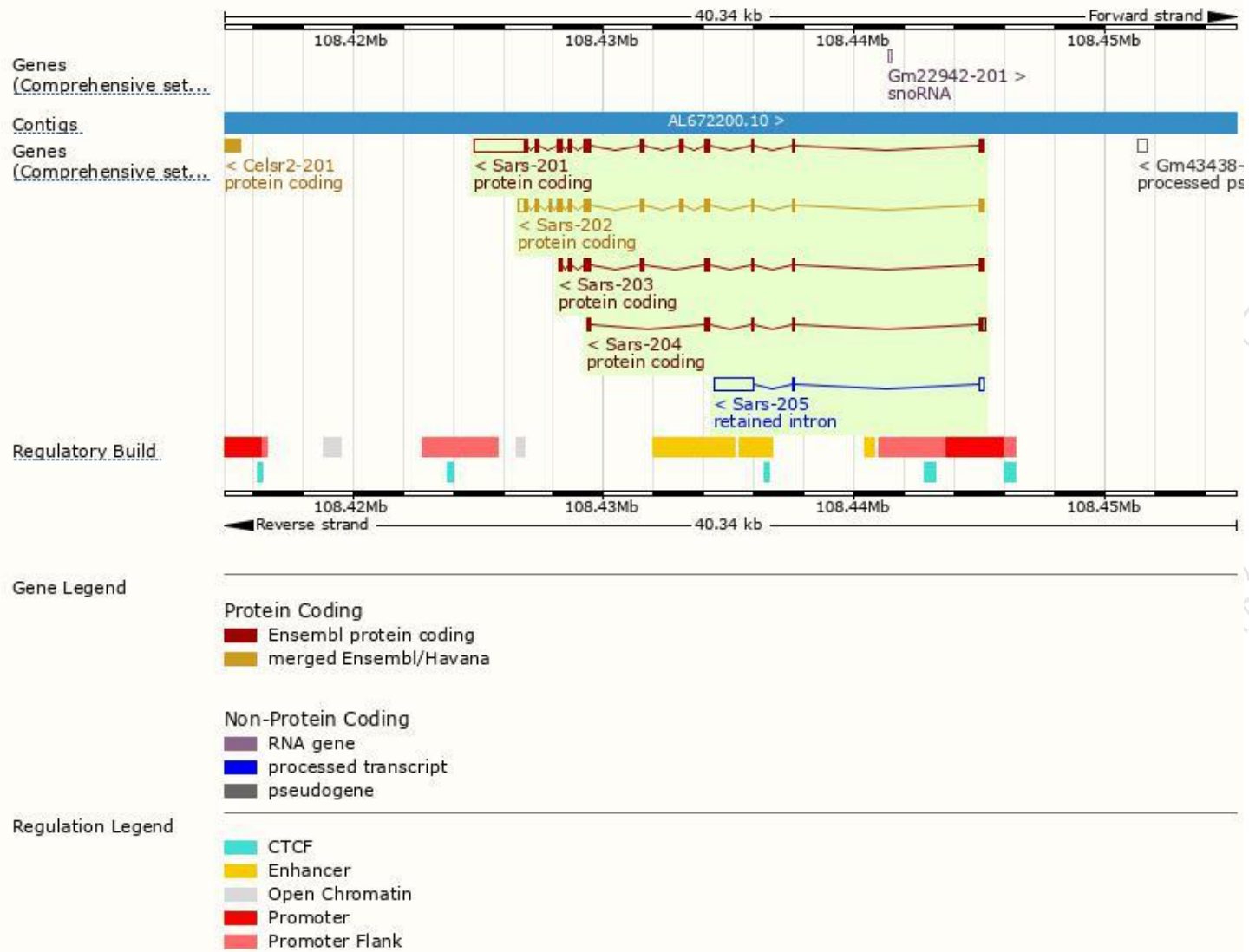
The gene has 5 transcripts, all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Sars-201	ENSMUST00000090553.11	3570	512aa	Protein coding	CCDS57254	P26638	TSL:1 GENCODE basic APPRIS P1
Sars-202	ENSMUST00000102625.10	1866	536aa	Protein coding	CCDS17760	Q8C483	TSL:1 GENCODE basic
Sars-203	ENSMUST00000132467.7	1067	352aa	Protein coding	-	A2AFS0	CDS 3' incomplete TSL:5
Sars-204	ENSMUST00000153499.1	637	186aa	Protein coding	-	A2AFS1	CDS 3' incomplete TSL:5
Sars-205	ENSMUST00000197647.1	1801	No protein	Retained intron	-	-	TSL:1

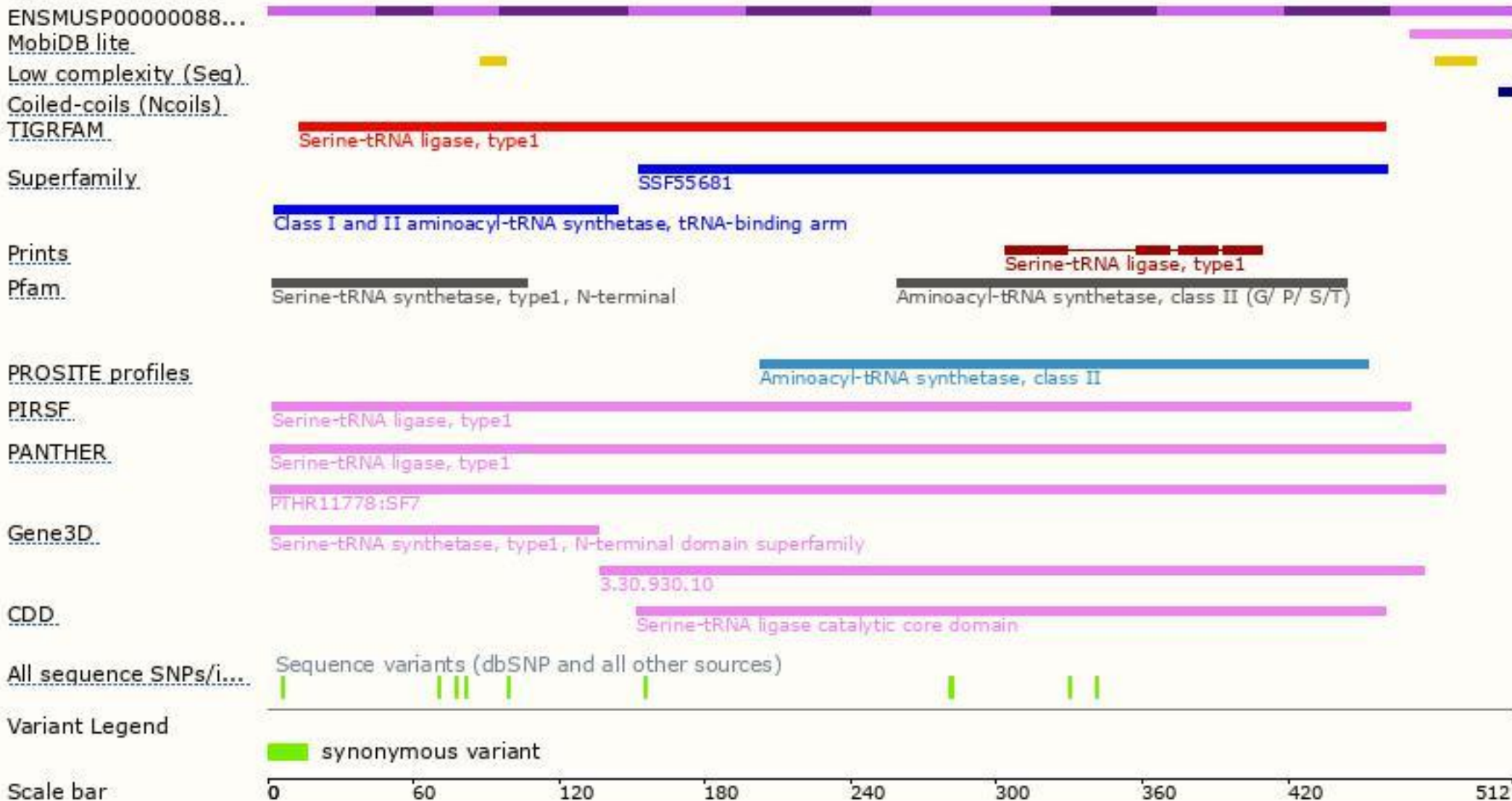
The strategy is based on the design of *Sars-201* transcript, The transcription is shown below



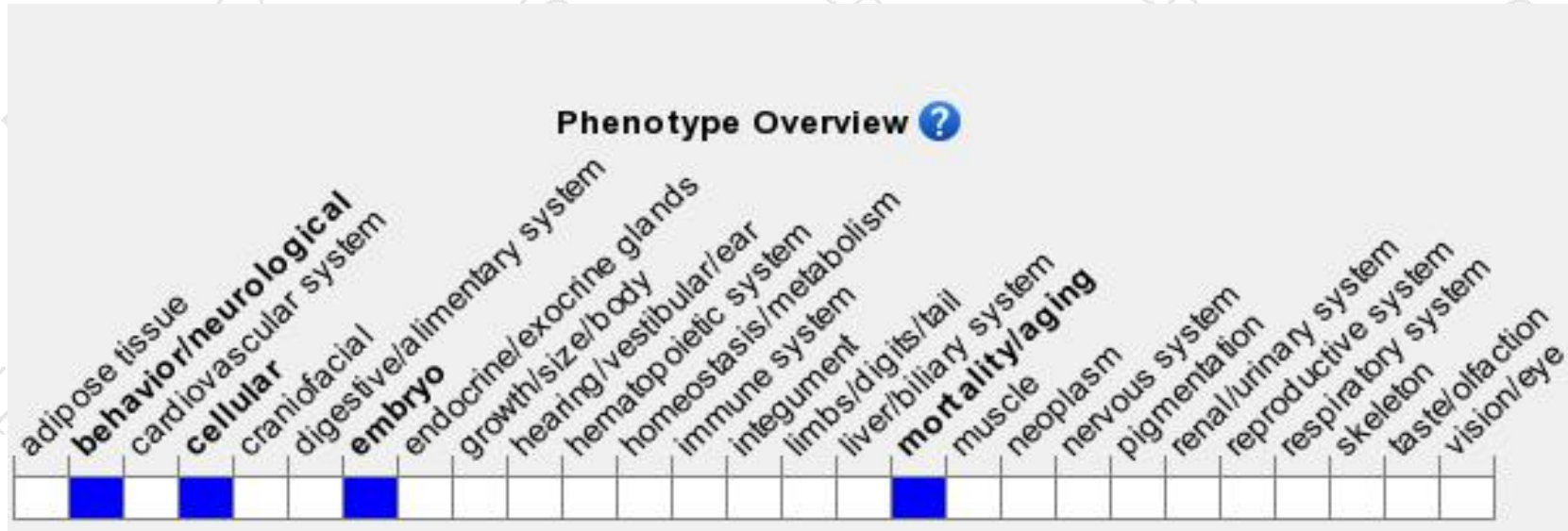
Genomic location distribution



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 a knock-out allele show complete embryonic lethality before implantation associated with abnormal morula morphology, increased cell death, and failure of blastocyst formation.

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

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