

Esco2 Cas9-CKO Strategy

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Reviewer:

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Project Overview

Project Name

Esco2

Project type

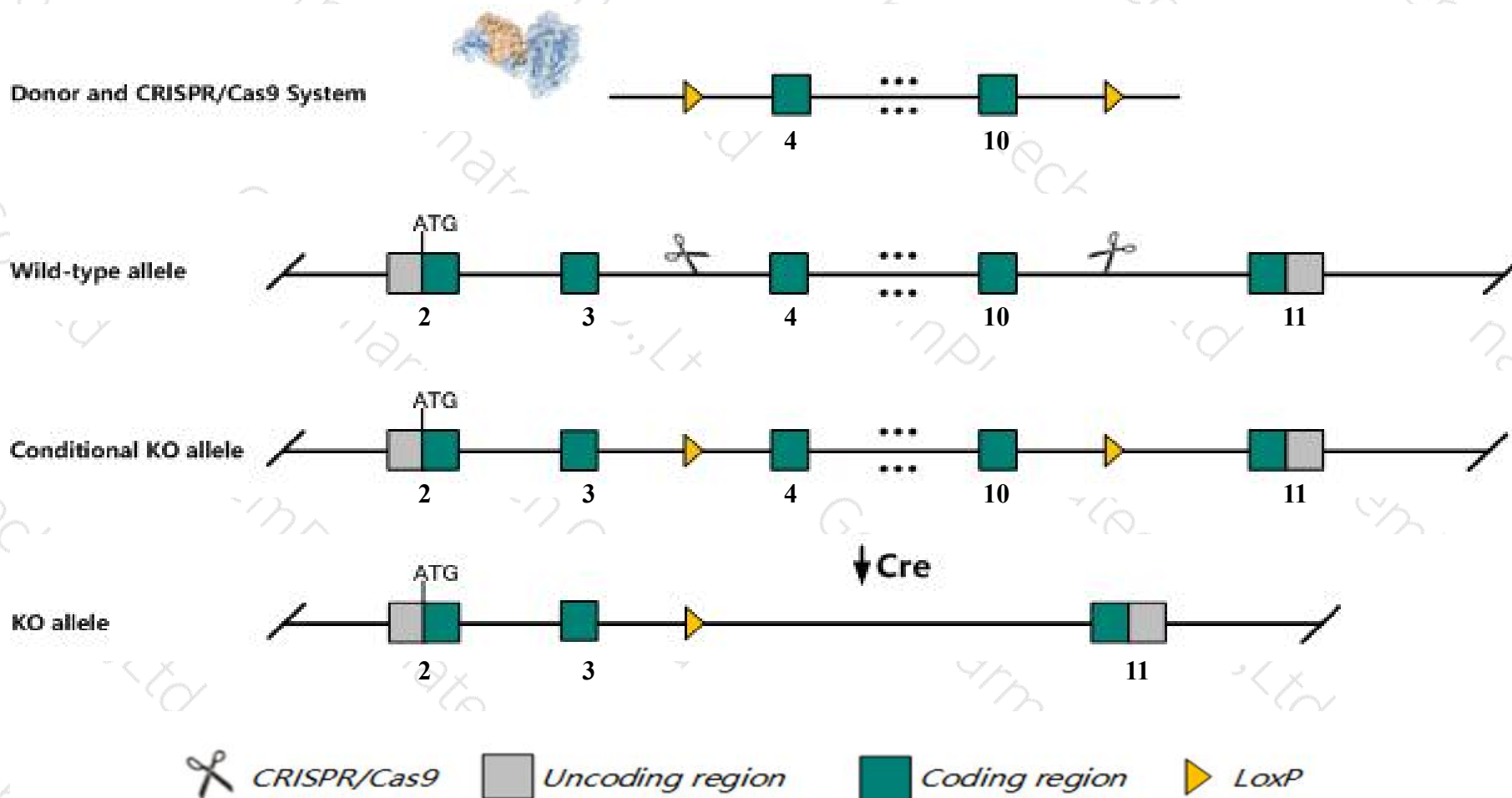
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Esco2* gene. The schematic diagram is as follows:



- The *Esco2* gene has 5 transcripts. According to the structure of *Esco2* gene, exon4-exon10 of *Esco2-201* (ENSMUST00000022613.9) transcript is recommended as the knockout region. The region contains 791bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Esco2* 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 complete embryonic lethality before implantation associated with impaired chromosome cohesion and abnormal mitosis.
- The *Esco2* gene is located on the Chr14. 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)

Esco2 establishment of sister chromatid cohesion N-acetyltransferase 2 [Mus musculus (house mouse)]

Gene ID: 71988, updated on 31-Jan-2019

Summary



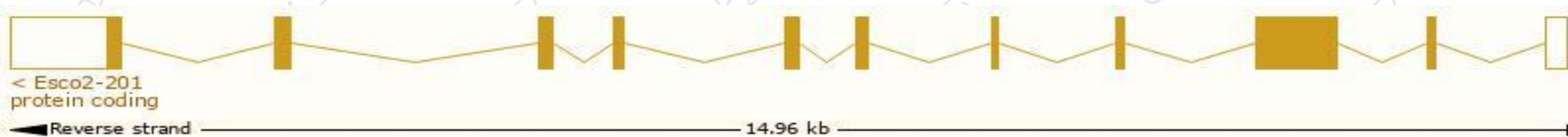
Official Symbol	Esco2 provided by MGI
Official Full Name	establishment of sister chromatid cohesion N-acetyltransferase 2 provided by MGI
Primary source	MGI:MGI:1919238
See related	Ensembl:ENSMUSG00000022034
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	2410004I17Rik, D030072L07Rik
Expression	Biased expression in liver E14 (RPKM 10.1), liver E14.5 (RPKM 7.6) and 10 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

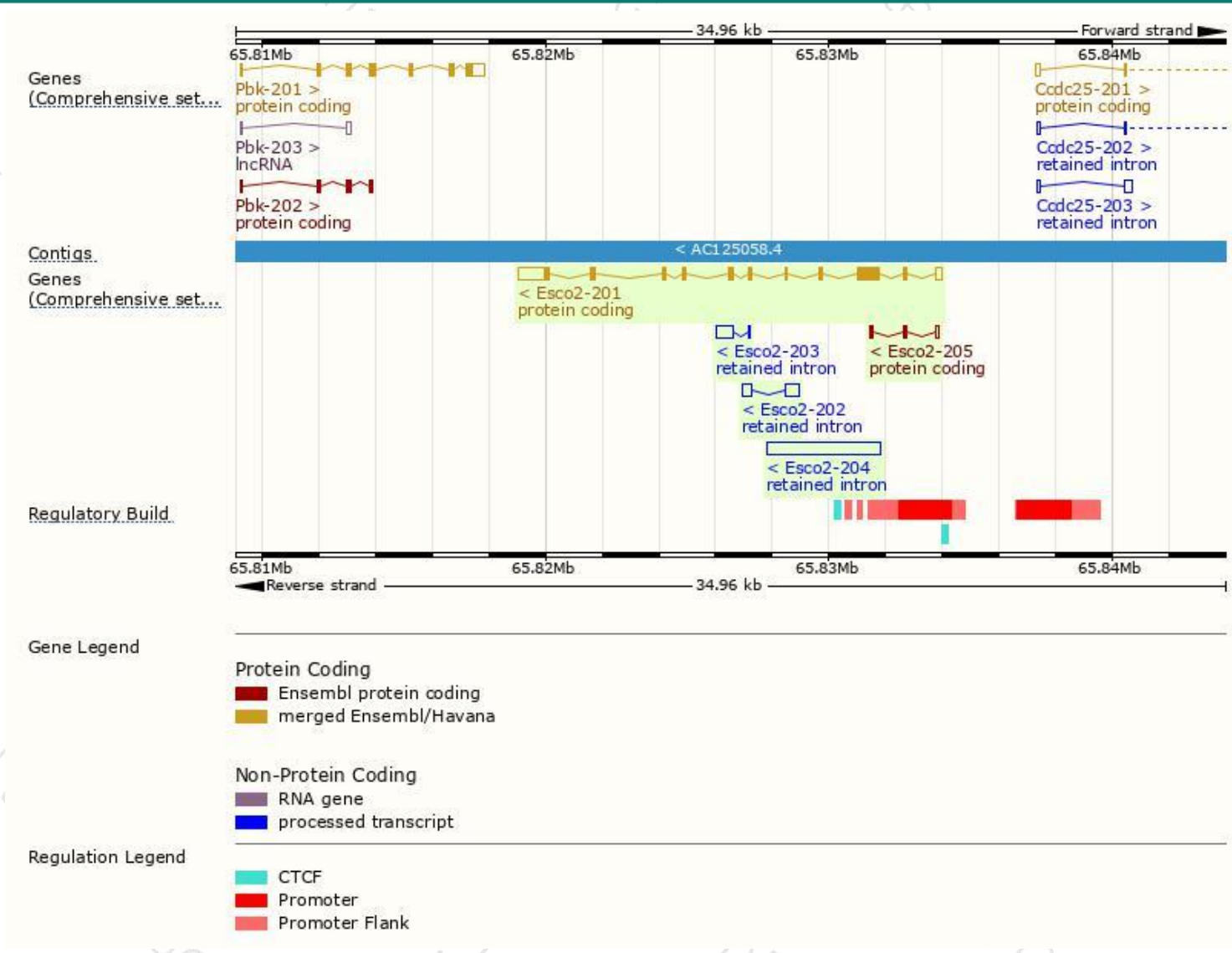
The gene has 5 transcripts, all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Esco2-201	ENSMUST0000022613.9	2913	592aa	Protein coding	CCDS27216	Q8CIB9	TSL:1 GENCODE basic APPRIS P1
Esco2-205	ENSMUST00000225853.1	326	68aa	Protein coding	-	A0A286YD00	CDS 3' incomplete
Esco2-204	ENSMUST00000224162.1	3996	No protein	Retained intron	-	-	
Esco2-202	ENSMUST00000131729.1	805	No protein	Retained intron	-	-	TSL:2
Esco2-203	ENSMUST00000136920.1	640	No protein	Retained intron	-	-	TSL:3

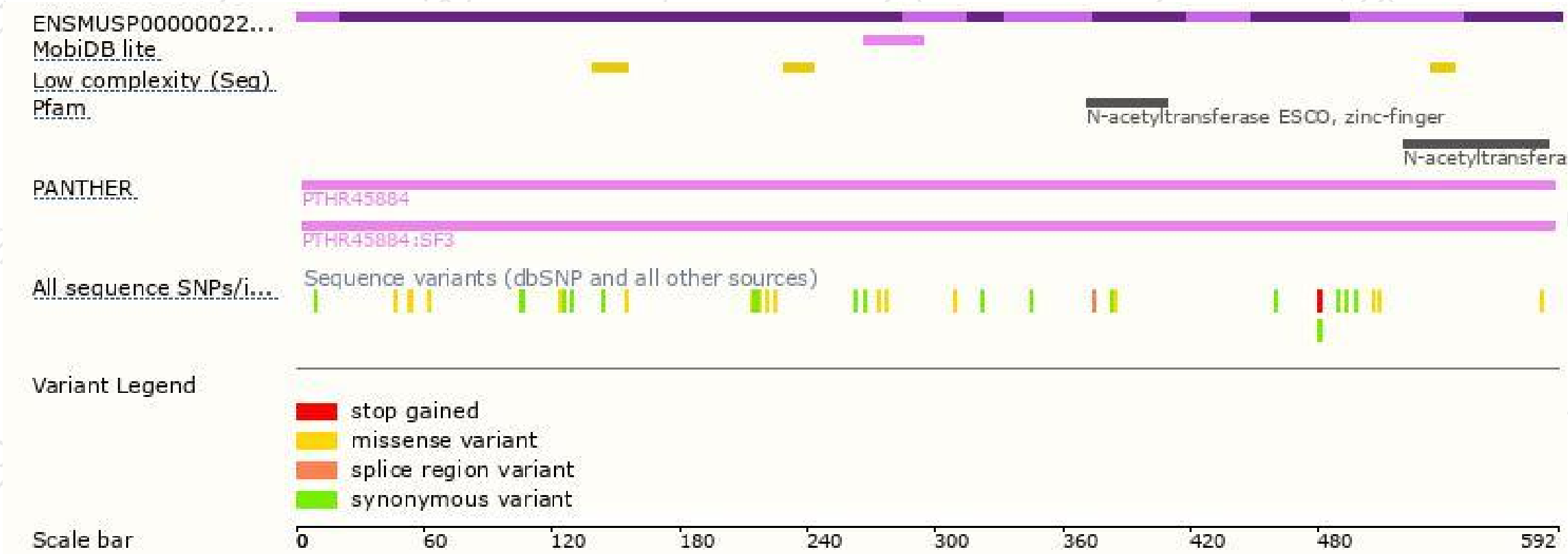
The strategy is based on the design of *Esco2-201* transcript, The transcription is shown below



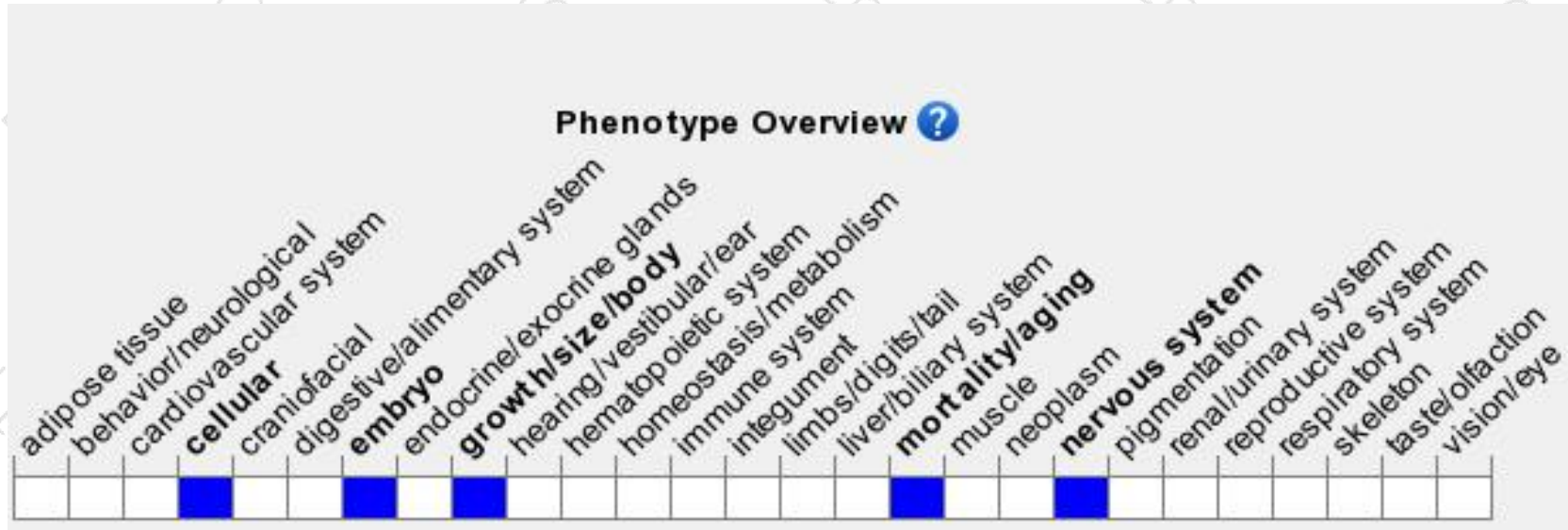
Genomic location distribution



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 exhibit complete embryonic lethality before implantation associated with impaired chromosome cohesion and abnormal mitosis.

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

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