Hectd1 Cas9-CKO Strategy

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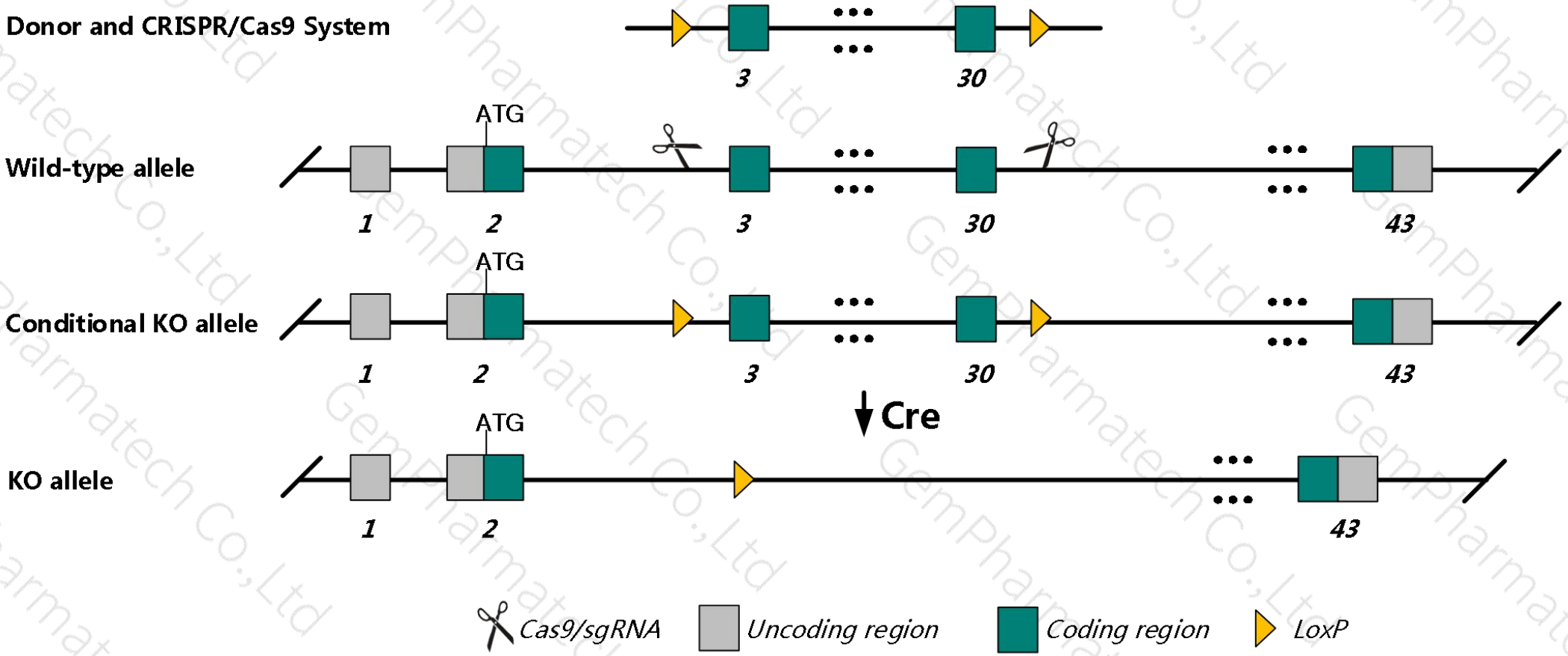
Project Overview

Project Name	***Hectd1***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Hectd1* gene. The schematic diagram is as follows:



Technical routes

- The *Hectd1* gene has 5 transcripts. According to the structure of *Hectd1* gene, exon3-exon30 of *Hectd1-201* (ENSMUST00000042052.8) transcript is recommended as the knockout region.The region contains most of the coding sequence.Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Hectd1* 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 that are homozygous for either a gene trapped or an ENU-induced allele exhibit exencephaly associated with impaired head mesenchyme development and neural tube closure, and show eye and cranial vault dysplasia. Homozygotes for another ENU-induced allele show congenital cardiovascular defects.

- The *Hectd1* gene is located on the Chr12. 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 gene transcription and translation processes, all risks cannot be predicted under existing information.

Gene information （NCBI）

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Hectd1 HECT domain E3 ubiquitin protein ligase 1 [Mus musculus (house mouse)]

Gene ID: 207304, updated on 26-Feb-2019

Summary

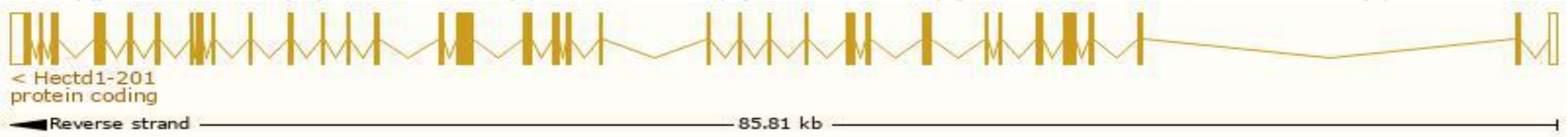
Official Symbol	Hectd1 provided by MGI
Official Full Name	HECT domain E3 ubiquitin protein ligase 1 provided by MGI
Primary source	MGI:MGI:2384768
See related	Ensembl:ENSMUSG00000035247
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	A630086P08Rik, AI844876, b2b327Clo, opm
Expression	Ubiquitous expression in bladder adult (RPKM 17.4), liver E14 (RPKM 15.1) and 28 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

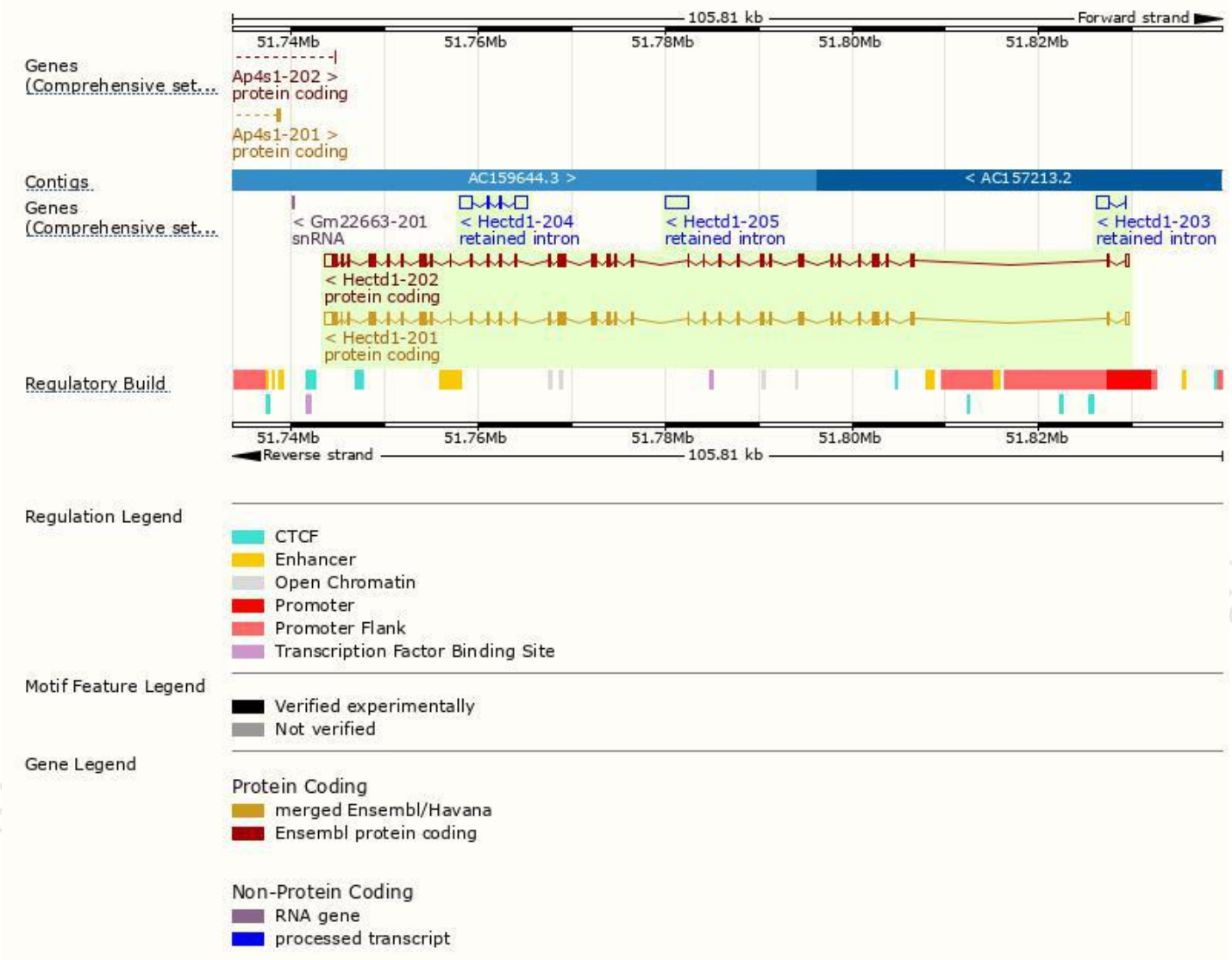
The gene has 5 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Hectd1-201	ENSMUST00000042052.8	8988	2610aa	Protein coding	CCDS49064	F8WIE5	TSL:5 GENCODE basic APPRIS P1
Hectd1-202	ENSMUST00000179265.7	9012	2618aa	Protein coding	-	Q69ZR2	TSL:5 GENCODE basic
Hectd1-204	ENSMUST00000218626.1	2895	No protein	Retained intron	-	-	TSL:1
Hectd1-205	ENSMUST00000220098.1	2575	No protein	Retained intron	-	-	TSL:NA
Hectd1-203	ENSMUST00000217804.1	1447	No protein	Retained intron	-	-	TSL:1

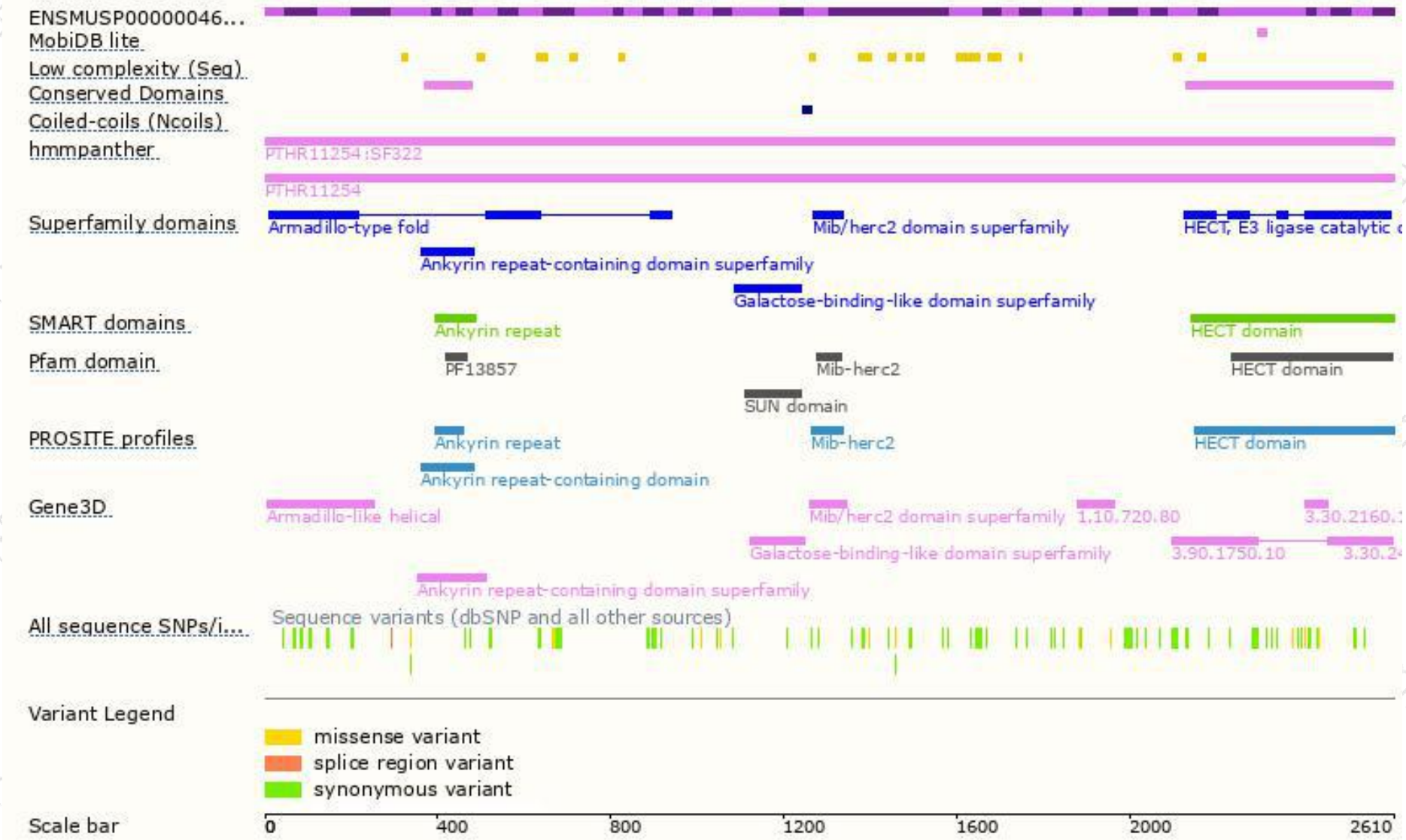
The strategy is based on the design of *Hectd1-201* transcript,The transcription is shown below



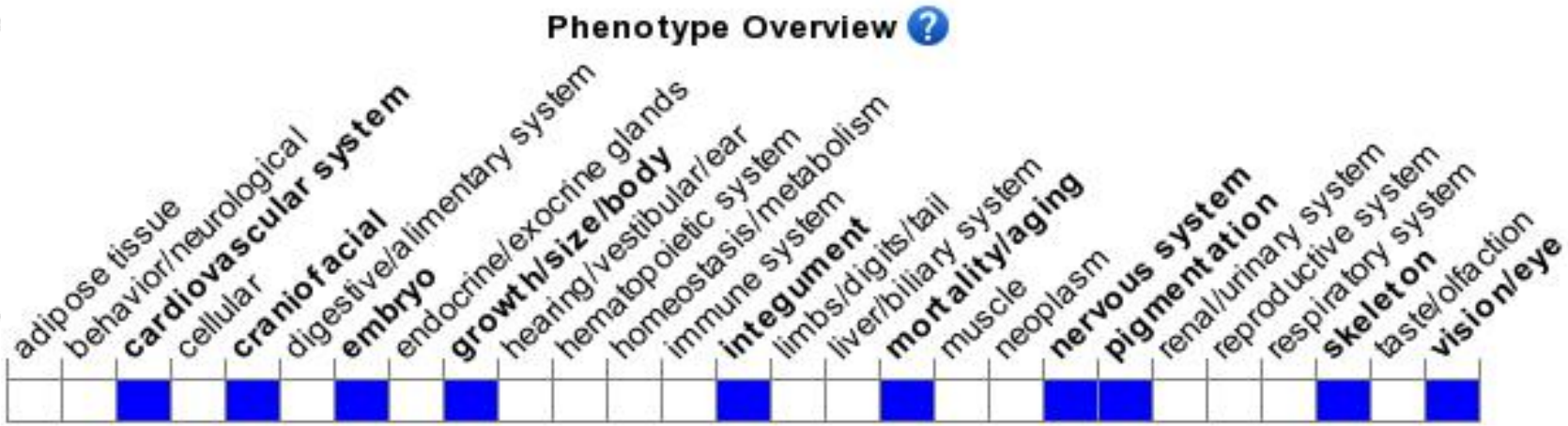
Genomic location distribution



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 that are homozygous for either a gene trapped or an ENU-induced allele exhibit exencephaly associated with impaired head mesenchyme development and neural tube closure, and show eye and cran vault dysplasia. Homozygotes for another ENU-induced allele show congenital cardiovascular defects.

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

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