

Bnc2 Cas9-CKO Strategy

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Reviewer:

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Project Overview

Project Name

Bnc2

Project type

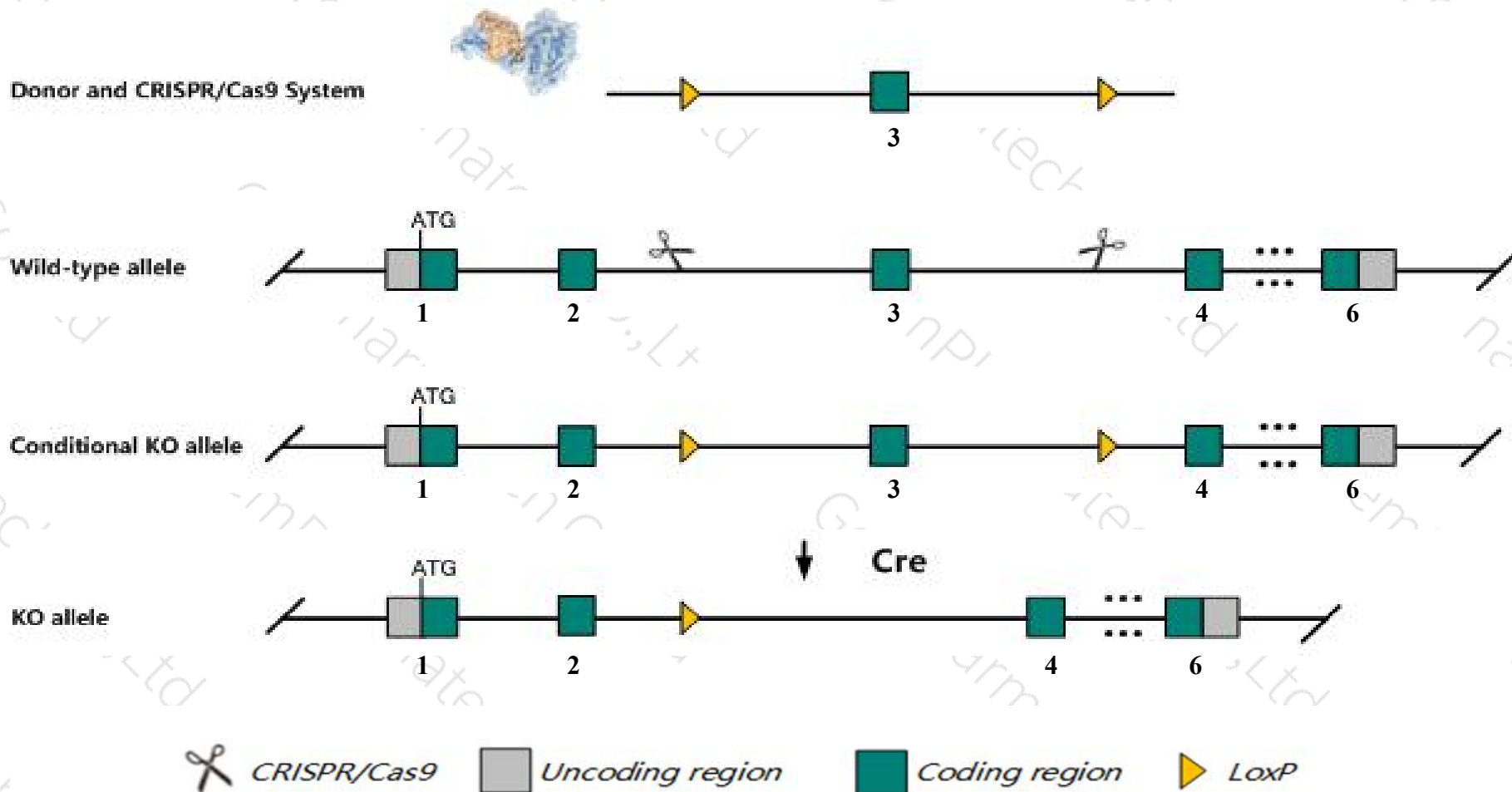
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Bnc2* gene. The schematic diagram is as follows:



- The *Bnc2* gene has 22 transcripts. According to the structure of *Bnc2* gene, exon3 of *Bnc2-215* (ENSMUST00000176691.7) transcript is recommended as the knockout region. The region contains 103bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Bnc2* 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 gene trap insertion die within 24 hrs of birth and display cleft palate, an overall size reduction of the head and tongue, and abnormal craniofacial bone development due to impaired multiplication of embryonic craniofacial mesenchymal cells.
- The *Bnc2* gene is located on the Chr4. 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)

Bnc2 basonuclein 2 [Mus musculus (house mouse)]

Gene ID: 242509, updated on 20-Mar-2019

Summary



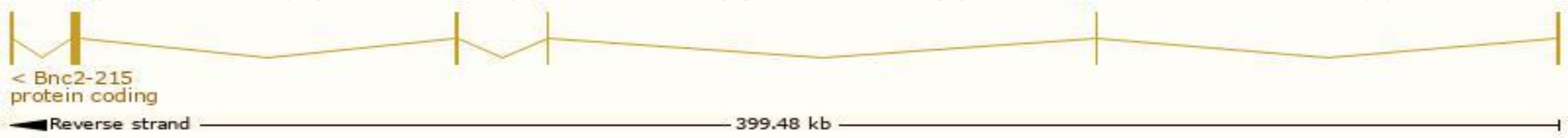
Official Symbol	Bnc2 provided by MGI
Official Full Name	basonuclein 2 provided by MGI
Primary source	MGI:MGI:2443805
See related	Ensembl:ENSMUSG000000028487
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	5031434M05Rik, 8430420F16Rik
Expression	Biased expression in limb E14.5 (RPKM 4.5), bladder adult (RPKM 2.8) and 13 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

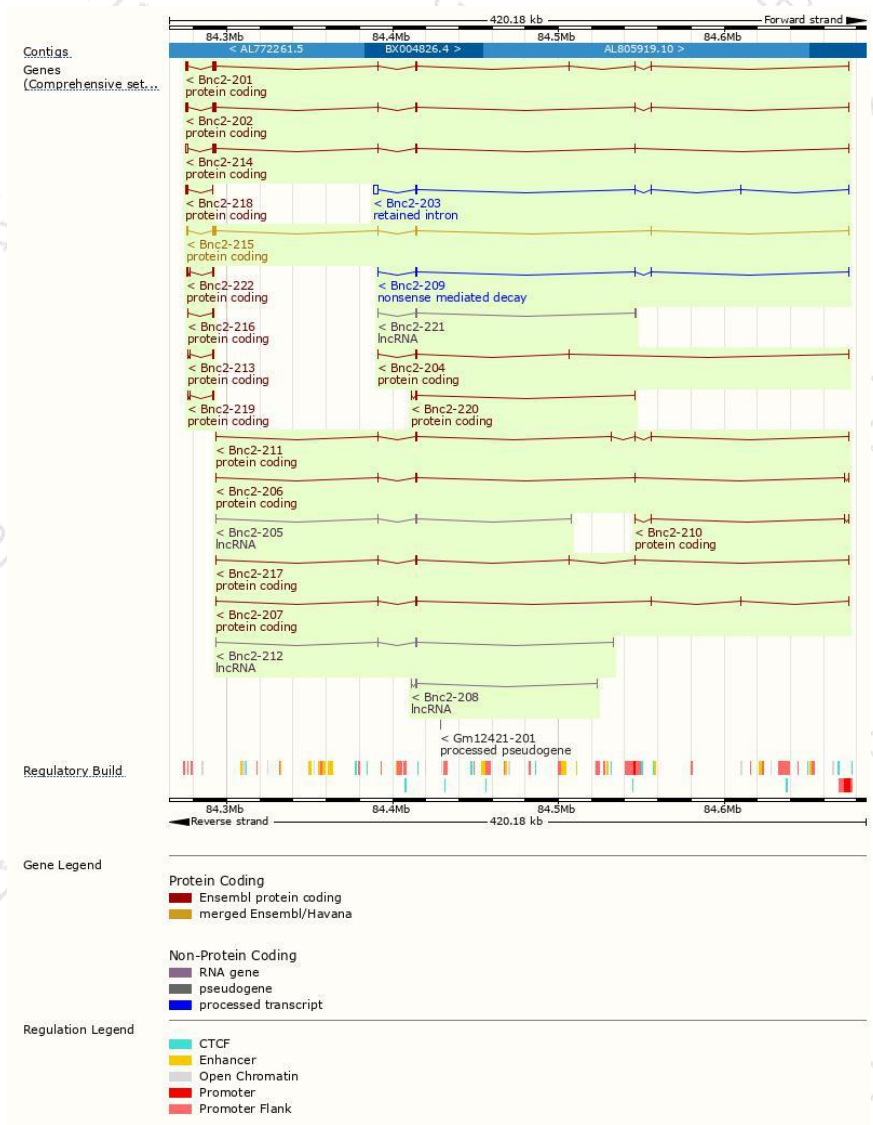
The gene has 22 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Bnc2-215	ENSMUST00000176691.7	3385	1032aa	Protein coding	CCDS1830.1	Q8BMO3	TSL:1 GENCODE basic APPRIS P2
Bnc2-201	ENSMUST00000102820.8	4133	1127aa	Protein coding	-	Q8BMO3	TSL:5 GENCODE basic APPRIS ALT2
Bnc2-214	ENSMUST00000176612.7	3963	961aa	Protein coding	-	H3BLG6	TSL:5 GENCODE basic
Bnc2-202	ENSMUST00000107198.6	3948	1099aa	Protein coding	-	H3BIU2	TSL:5 GENCODE basic APPRIS ALT2
Bnc2-211	ENSMUST00000176418.7	1236	405aa	Protein coding	-	H3BKX5	CDS 3' incomplete TSL:5
Bnc2-206	ENSMUST00000175800.7	1232	294aa	Protein coding	-	H3BJ03	CDS 3' incomplete TSL:5
Bnc2-218	ENSMUST00000176971.1	1127	239aa	Protein coding	-	H3BL10	CDS 5' incomplete TSL:5
Bnc2-217	ENSMUST00000176947.7	763	237aa	Protein coding	-	H3BKJ2	CDS 3' incomplete TSL:5
Bnc2-216	ENSMUST00000176702.7	723	241aa	Protein coding	-	H3BIY6	5' and 3' truncations in transcript evidence prevent annotation of the start and the end of the CDS. CDS 5' and 3' incomplete TSL:5
Bnc2-207	ENSMUST00000175969.7	636	181aa	Protein coding	-	H3BL54	CDS 3' incomplete TSL:5
Bnc2-220	ENSMUST00000177040.1	626	126aa	Protein coding	-	H3BJR1	CDS 5' incomplete TSL:5
Bnc2-210	ENSMUST00000176370.1	566	29aa	Protein coding	-	H3BJE5	CDS 3' incomplete TSL:5
Bnc2-222	ENSMUST00000177277.7	561	85aa	Protein coding	-	H3BKY6	CDS 5' incomplete TSL:5
Bnc2-204	ENSMUST00000175756.7	364	87aa	Protein coding	-	H3BKR9	CDS 3' incomplete TSL:5
Bnc2-213	ENSMUST00000176601.1	280	86aa	Protein coding	-	H3BKQ4	CDS 5' incomplete TSL:5
Bnc2-219	ENSMUST00000176998.7	276	82aa	Protein coding	-	H3BK78	CDS 5' incomplete TSL:5
Bnc2-209	ENSMUST00000176346.7	692	64aa	Nonsense mediated decay	-	H3BJD5	TSL:3
Bnc2-203	ENSMUST00000123276.7	2986	No protein	Retained intron	-	-	TSL:2
Bnc2-208	ENSMUST00000176264.1	845	No protein	lncRNA	-	-	TSL:5
Bnc2-205	ENSMUST00000175757.7	792	No protein	lncRNA	-	-	TSL:3
Bnc2-221	ENSMUST00000177256.7	545	No protein	lncRNA	-	-	TSL:5
Bnc2-212	ENSMUST00000176476.7	541	No protein	lncRNA	-	-	TSL:5

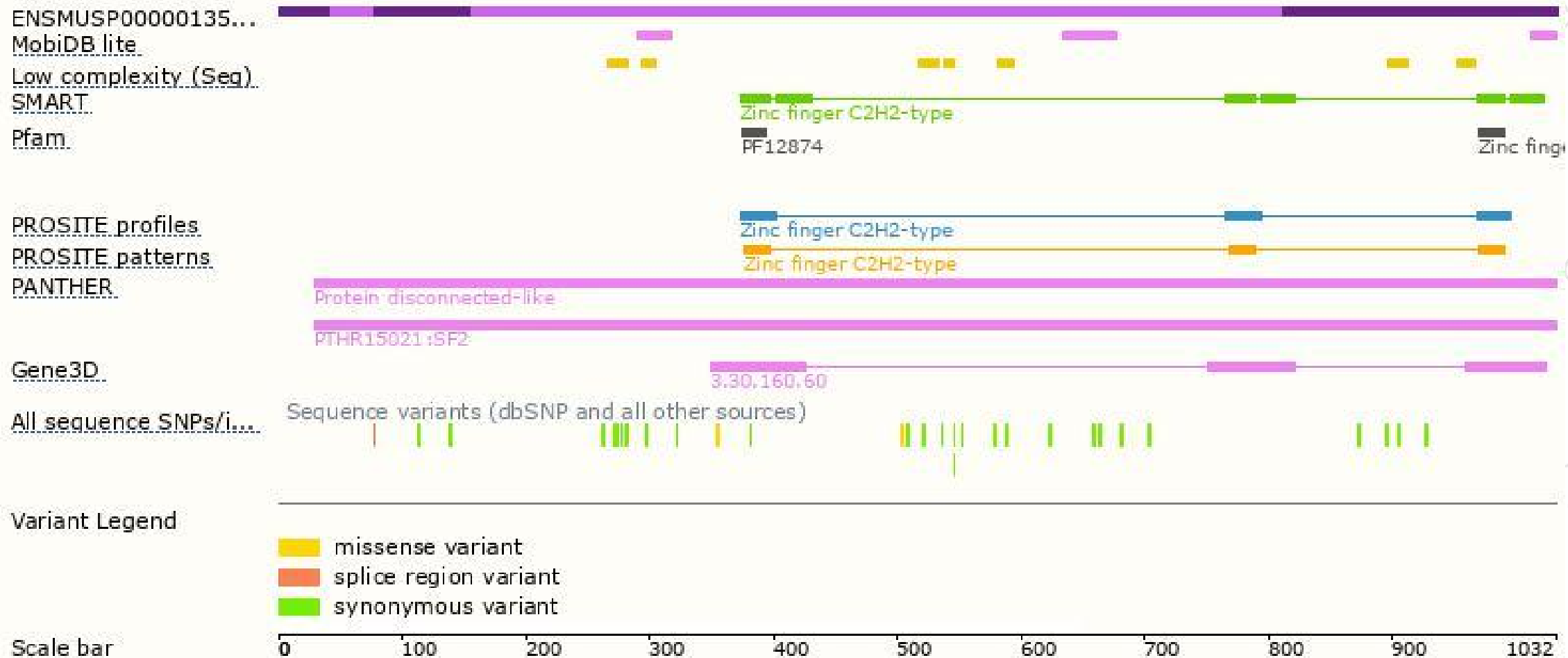
The strategy is based on the design of *Bnc2-215* transcript,The transcription is shown below



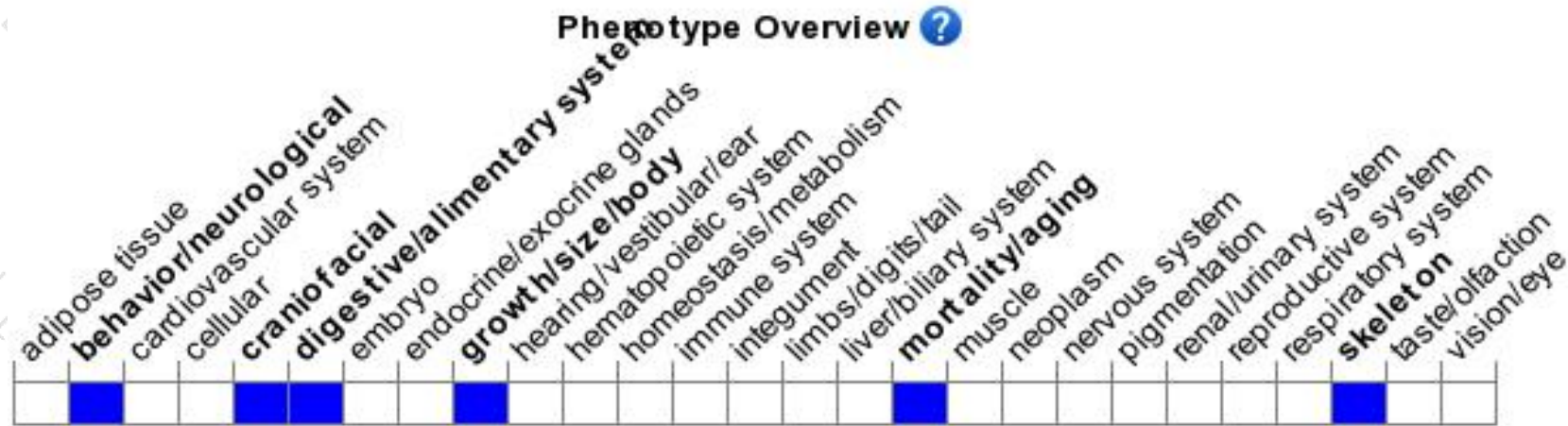
Genomic location distribution



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 gene trap insertion die within 24 hrs of birth and display cleft palate, an overall size reduction of the head and tongue, and abnormal craniofacial bone development due to impaired multiplication of embryonic craniofacial mesenchymal cells.

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

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