

Id2 Cas9-CKO Strategy

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Reviewer:

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Project Overview

Project Name

Id2

Project type

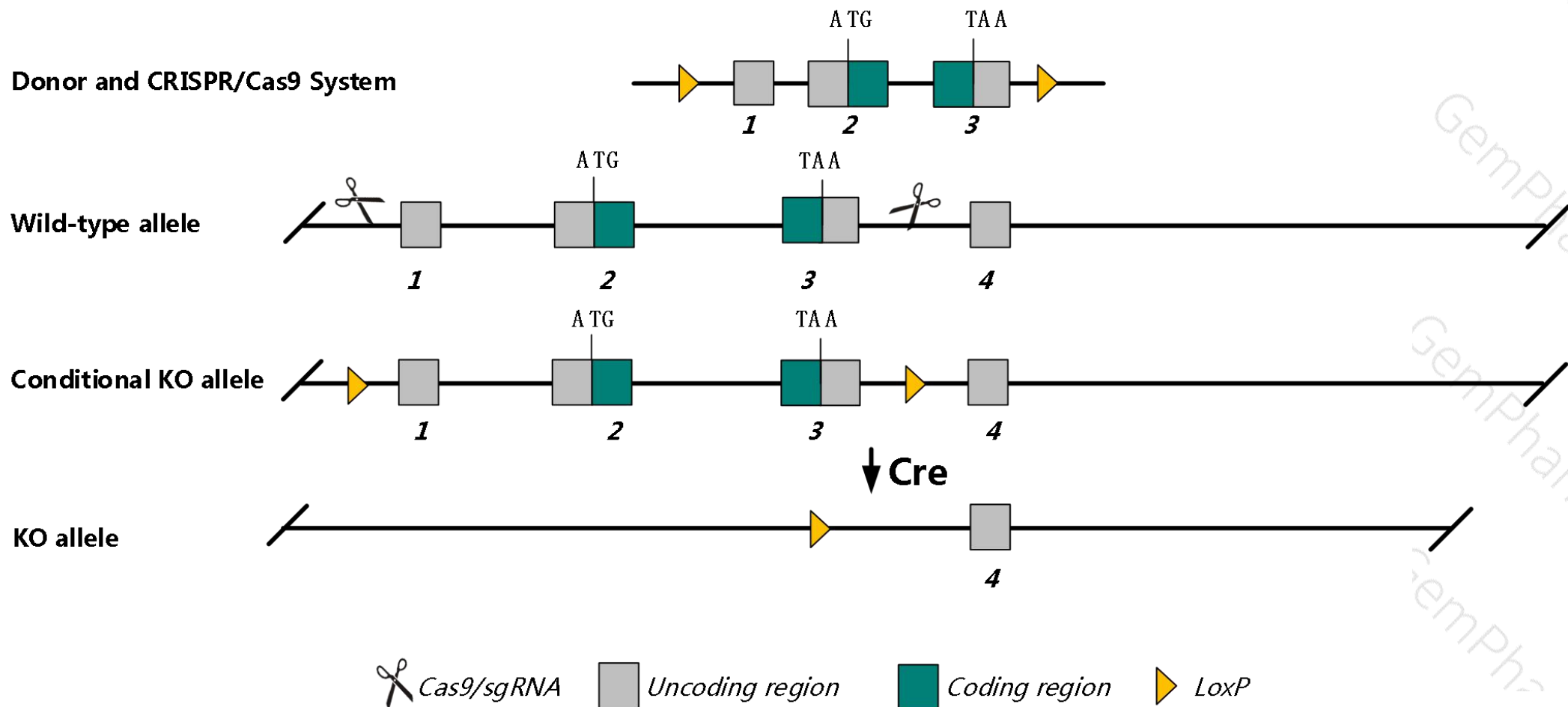
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Id2* gene. The schematic diagram is as follows:



- The *Id2* gene has 3 transcripts. According to the structure of *Id2* gene, exon1-exon3 of *Id2-202* (ENSMUST00000221761.1) 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 *Id2* 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 disruptions in this gene display postnatal lethality with immune system defects. Homozygotes may also have defects in the digestive tract, kidneys, adipose tissue and in mammary gland development.
- The *Id2* 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 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)

Id2 inhibitor of DNA binding 2 [Mus musculus (house mouse)]

Gene ID: 15902, updated on 13-Mar-2020

Summary

Official Symbol Id2 provided by [MGI](#)

Official Full Name inhibitor of DNA binding 2 provided by [MGI](#)

Primary source [MGI:MGI:96397](#)

See related [Ensembl:ENSMUSG00000020644](#)

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 AI255428, C78922, Idb2, bHLHb26

Expression Ubiquitous expression in kidney adult (RPKM 169.1), adrenal adult (RPKM 168.8) and 26 other tissues [See more](#)

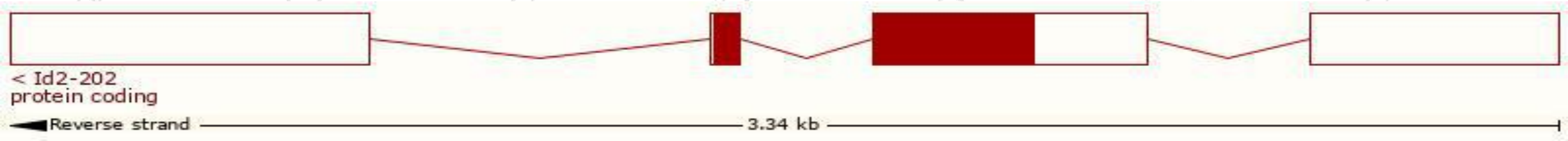
Orthologs [human](#) [all](#)

Transcript information (Ensembl)

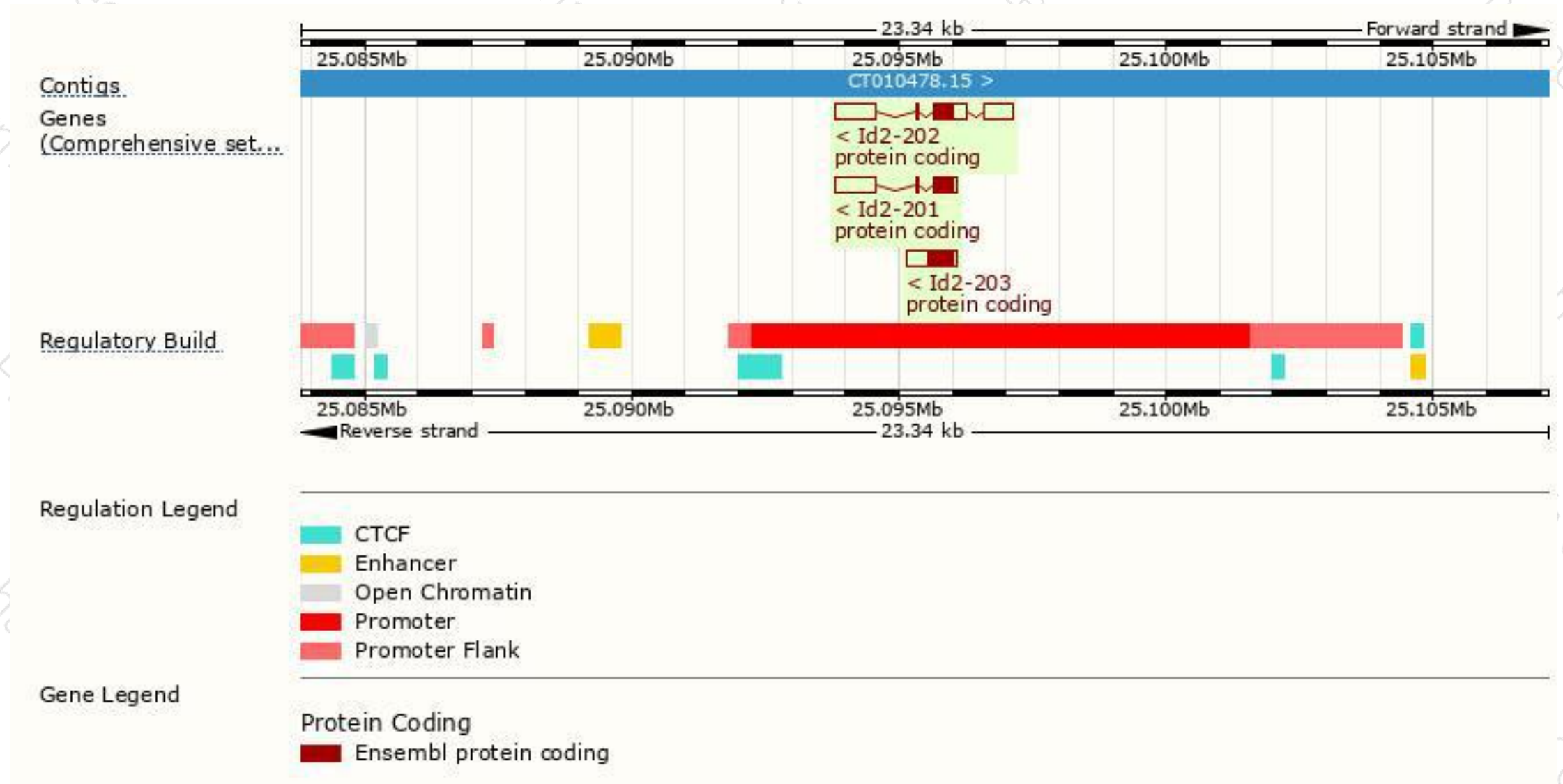
The gene has 3 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Id2-202	ENSMUST00000221761.1	1969	134aa	Protein coding	CCDS25846	P41136 Q545T4	TSL:5 GENCODE basic APPRIS is a system to annotate alternatively spliced transcripts based on a range of computational methods to identify the most functionally important transcript(s) of a gene. APPRIS P1
Id2-201	ENSMUST0000020974.6	1270	134aa	Protein coding	CCDS25846	P41136 Q545T4	TSL:1 GENCODE basic APPRIS is a system to annotate alternatively spliced transcripts based on a range of computational methods to identify the most functionally important transcript(s) of a gene. APPRIS P1
Id2-203	ENSMUST00000222667.1	958	155aa	Protein coding	-	A0A1Y7VMT3	TSL:NA GENCODE basic

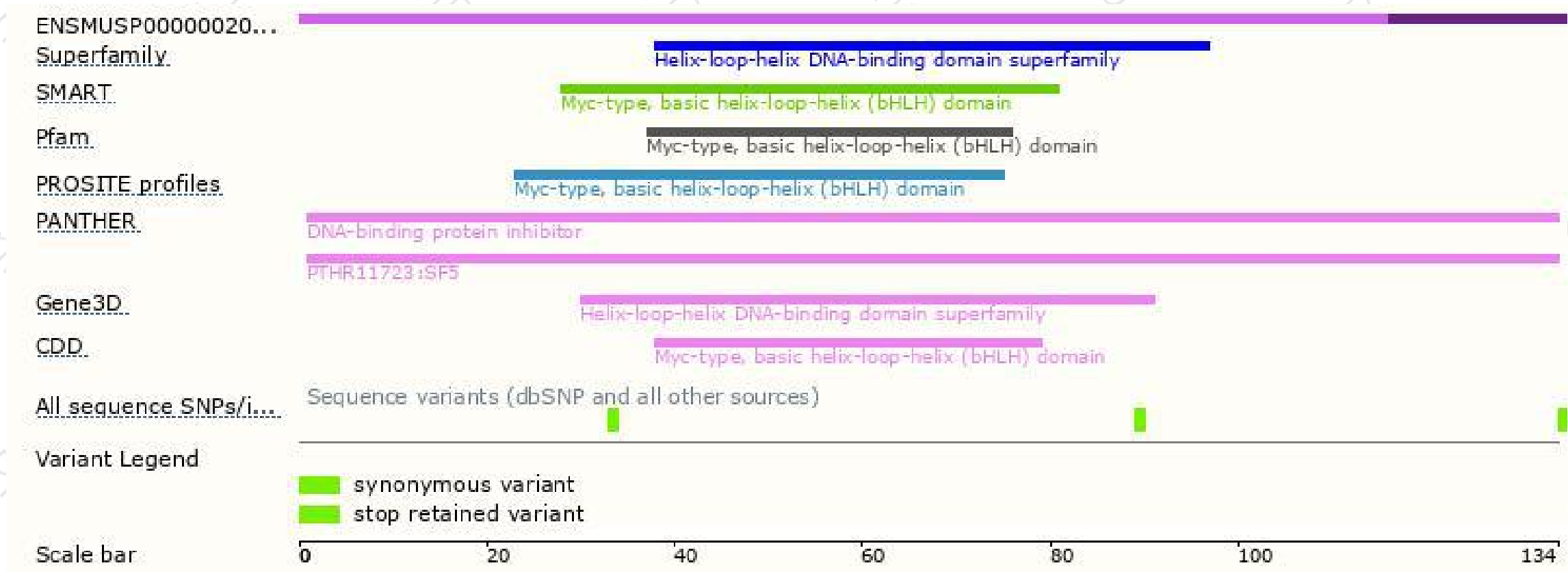
The strategy is based on the design of *Id2-202* transcript,The transcription is shown below



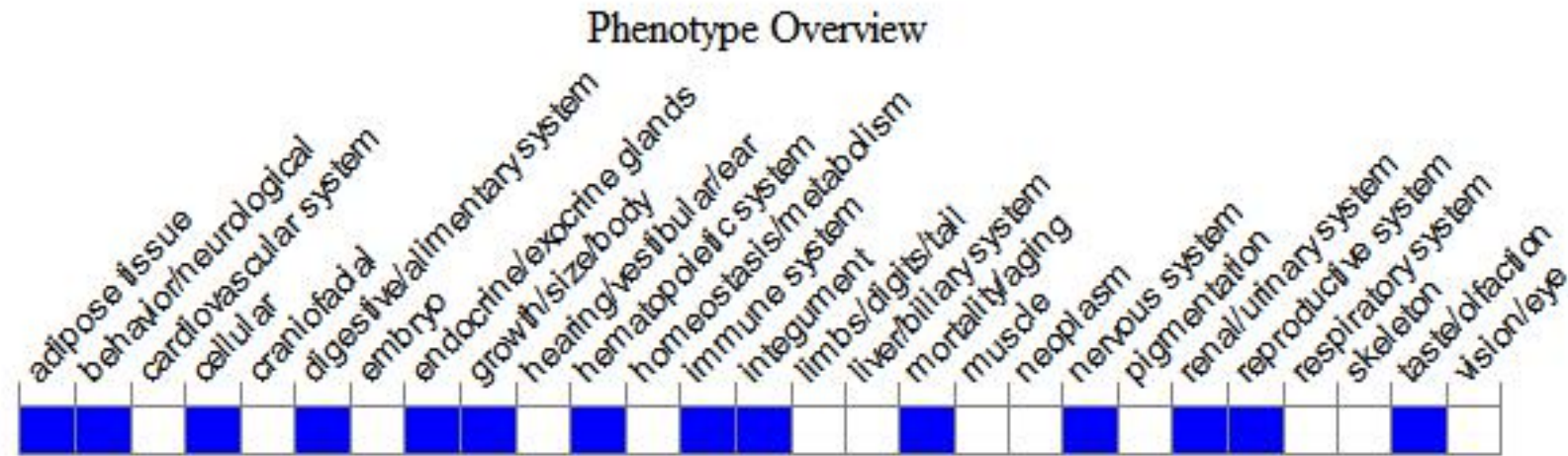
Genomic location distribution



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 disruptions in this gene display postnatal lethality with immune system defects. Homozygotes may also have defects in the digestive tract, kidneys, adipose tissue and in mammary gland development.

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

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