

Isl2 Cas9-KO Strategy

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Project Overview

Project Name

Isl2

Project type

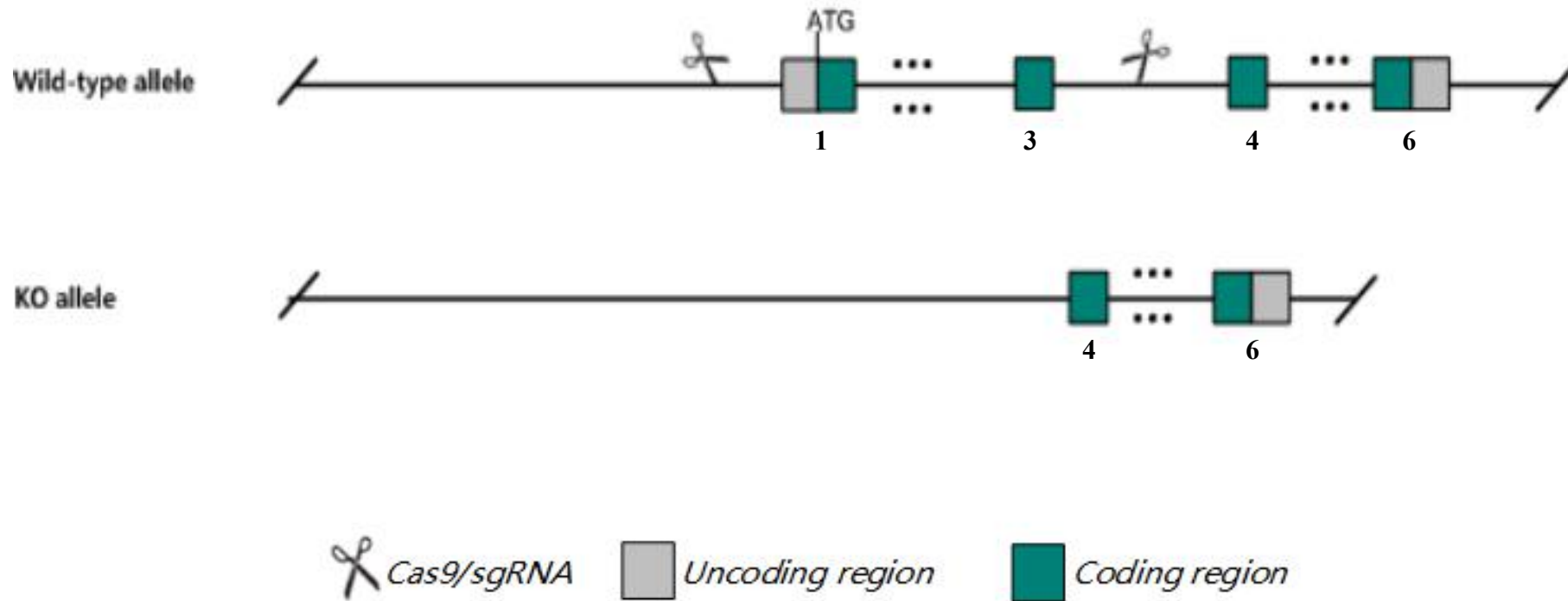
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Isl2* gene. The schematic diagram is as follows:



The *Isl2* gene has 5 transcripts. According to the structure of *Isl2* gene, exon1-exon3 of *Isl2*-201(ENSMUST00000034869.11) transcript is recommended as the knockout region. The region contains start codon ATG. Knock out the region will result in disruption of protein function.

In this project we use CRISPR/Cas9 technology to modify *Isl2* gene. The brief process is as follows: sgRNA was transcribed in vitro. Cas9 and sgRNA 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.

According to the existing MGI data, mutations of this gene result in neonatal lethality, motor neuron migration defects and impaired visceral motor neuron differentiation.

The *Isl2* gene is located on the Chr9. 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 the gene knockout on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

Isl2 insulin related protein 2 (islet 2) [Mus musculus (house mouse)]

Gene ID: 104360, updated on 12-Jan-2021

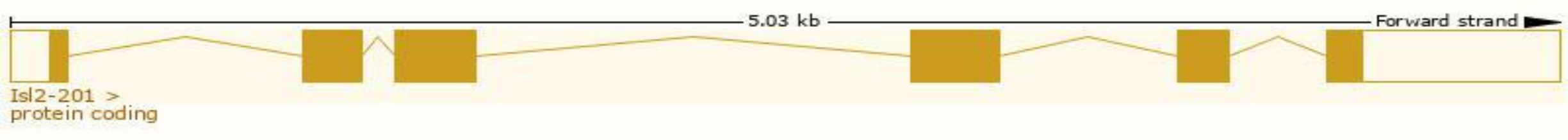
Summary**Official Symbol** Isl2 provided by [MGI](#)**Official Full Name** insulin related protein 2 (islet 2) provided by [MGI](#)**Primary source** [MGI:MGI:109156](#)**See related** [Ensembl:ENSMUSG00000032318](#)**Gene type** protein coding**RefSeq status** VALIDATED**Organism** [Mus musculus](#)**Lineage** Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus**Also known as** 3110001N10Rik, isle**Expression** Biased expression in CNS E11.5 (RPKM 2.3), colon adult (RPKM 1.4) and 11 other tissues [See more](#)**Orthologs** [human](#) [all](#)

Transcript information Ensembl

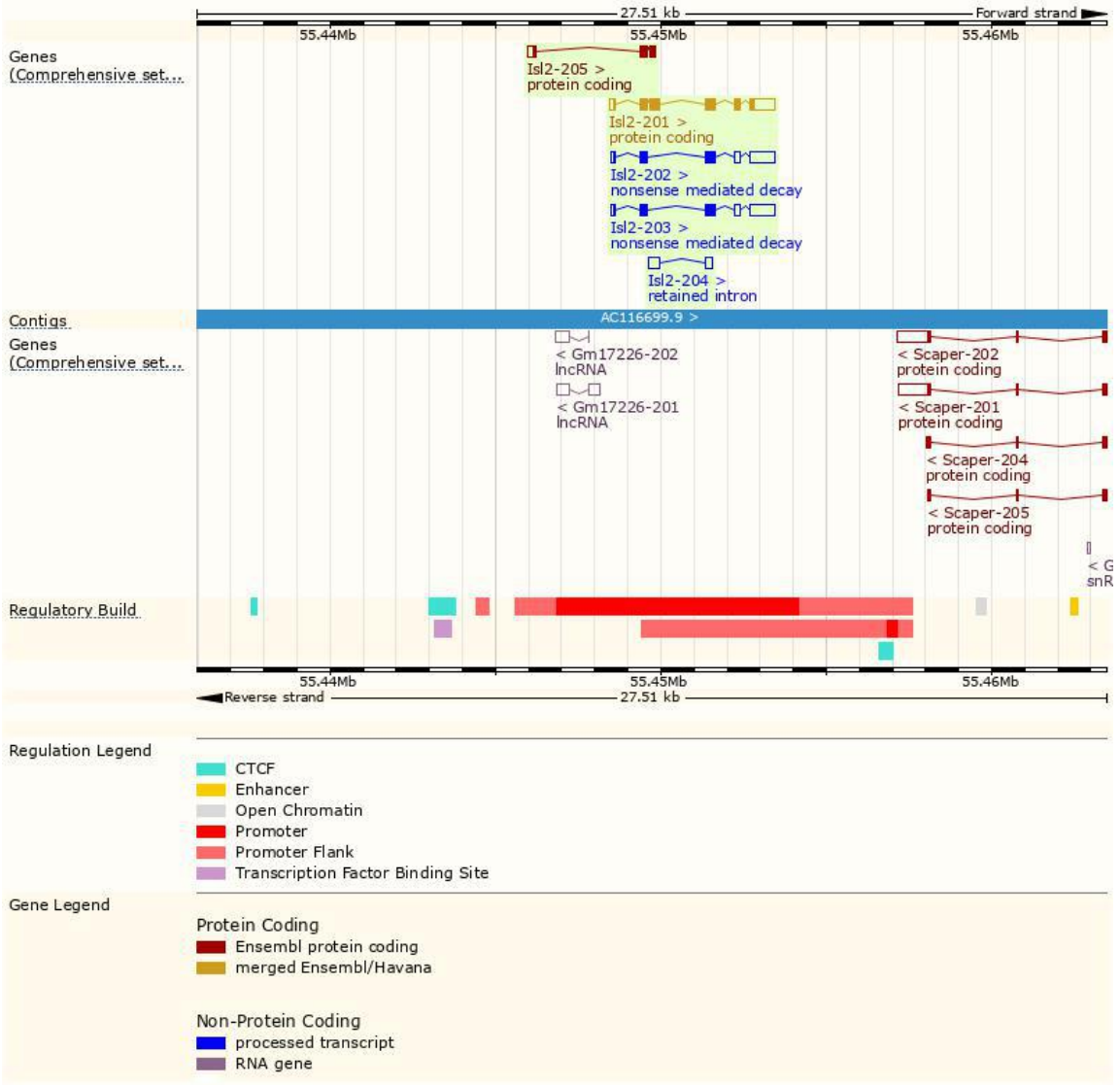
The gene has 5 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Isl2-201	ENSMUST00000034869.11	1854	359aa	Protein coding	CCDS23205		TSL:1 , GENCODE basic , APPRIS P1 ,
Isl2-205	ENSMUST00000175950.8	637	151aa	Protein coding	-		CDS 3' incomplete , TSL:3 ,
Isl2-203	ENSMUST00000164373.8	1535	174aa	Nonsense mediated decay	-		TSL:1 ,
Isl2-202	ENSMUST00000114290.4	1532	174aa	Nonsense mediated decay	-		TSL:1 ,
Isl2-204	ENSMUST00000165302.2	529	No protein	Retained intron	-		TSL:3 ,

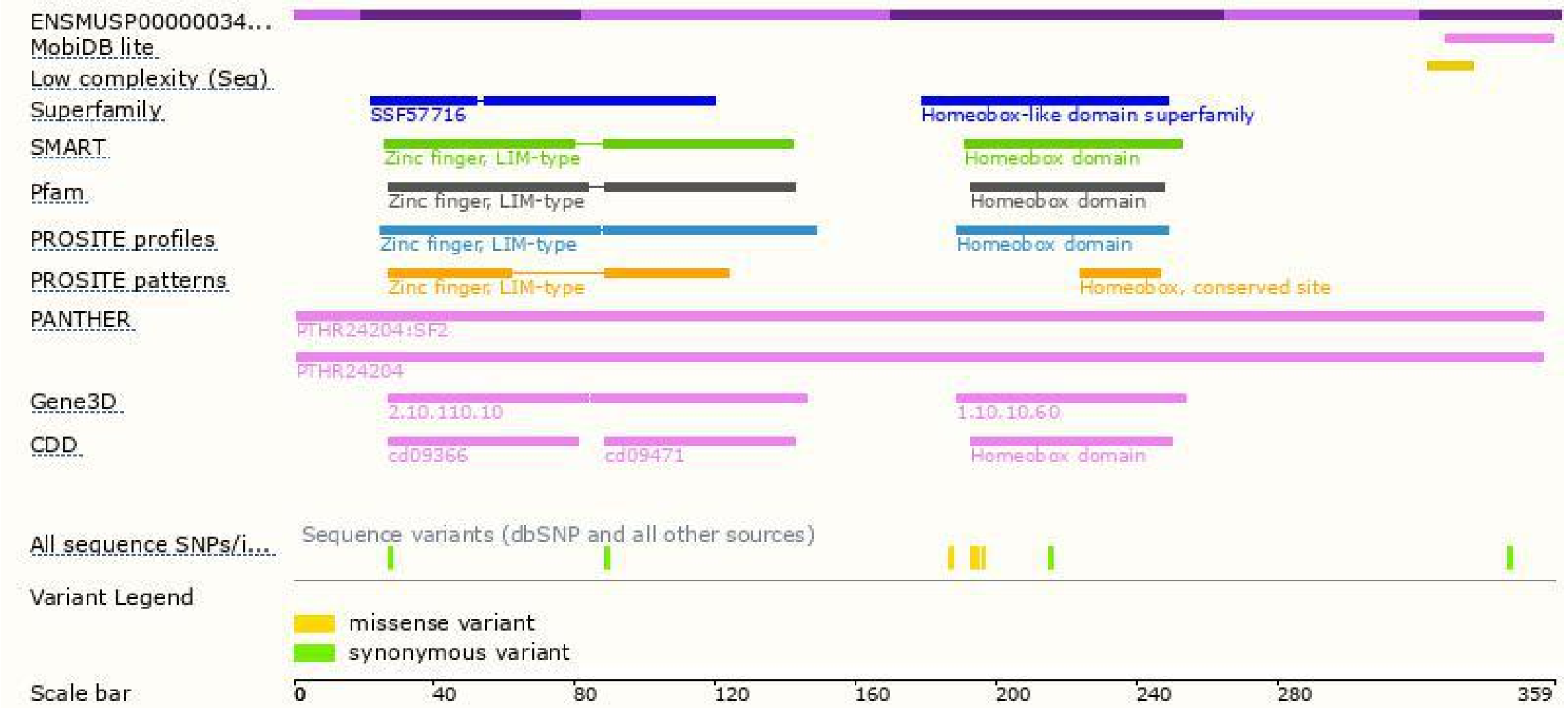
The strategy is based on the design of *Isl2-201* transcript,the transcription is shown below:



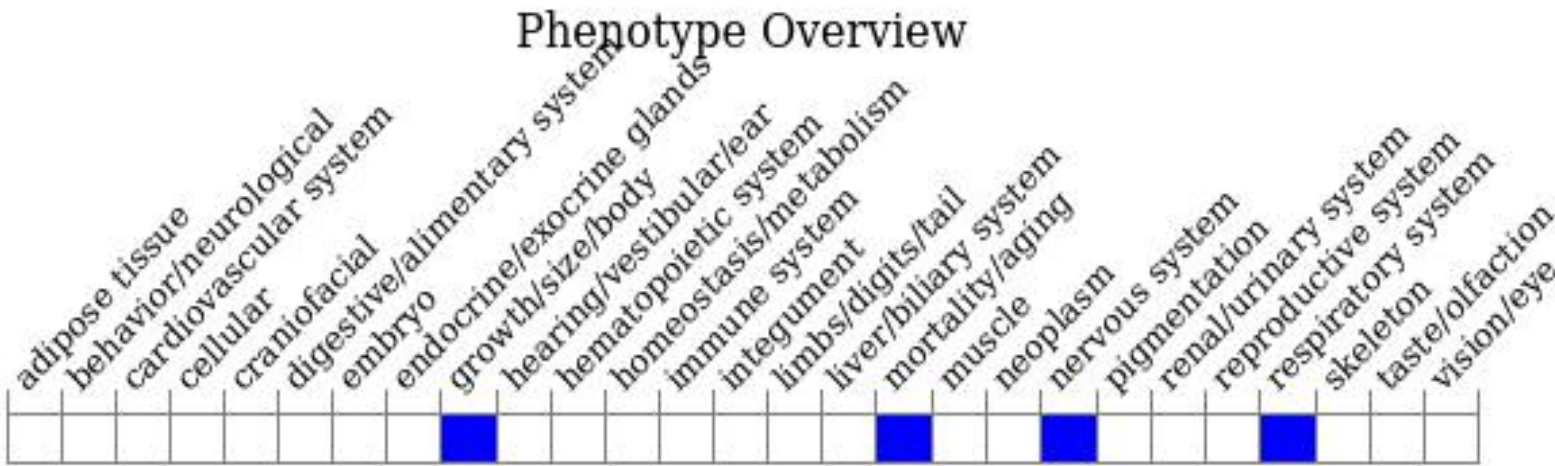
Genomic location distribution



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, mutations of this gene result in neonatal lethality, motor neuron migration defects and impaired visceral motor neuron differentiation.

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

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