

Sdhb Cas9-CKO Strategy

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Reviewer:

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Project Overview

Project Name

Sdhb

Project type

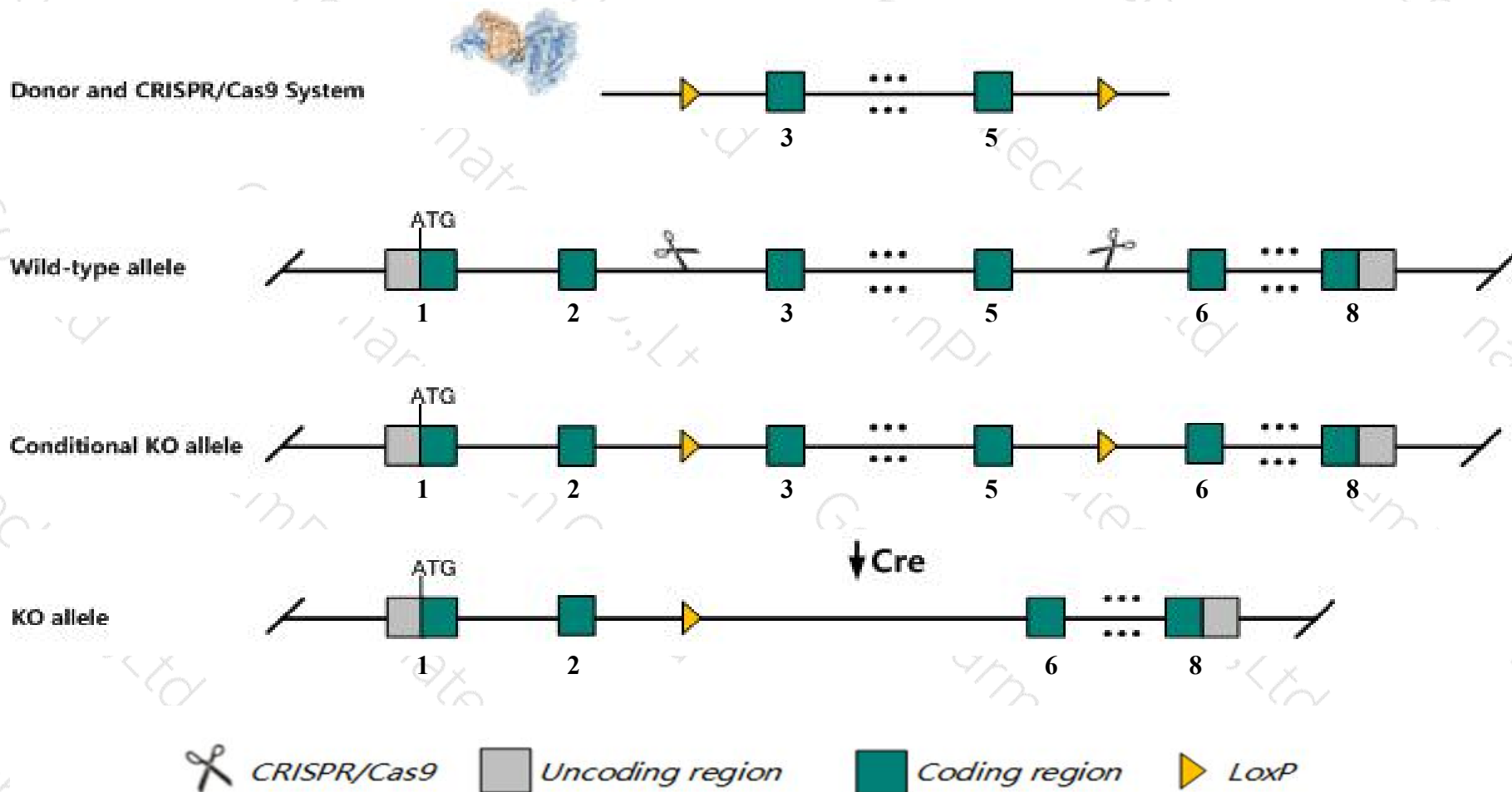
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

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



- The *Sdhb* gene has 3 transcripts. According to the structure of *Sdhb* gene, exon3-exon5 of *Sdhb-201* (ENSMUST00000010007.8) transcript is recommended as the knockout region. The region contains 340bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Sdhb* 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, The gene is involved in the hypoxia-induced RNA editing pathway in monocytes. Heterozygous compound KOs show reduced increase in blood hemoglobin under hypoxic conditions. Homozygous inactivation of this gene results in complete embryonic lethality.
- The *Sdhb* 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)

Sdhb succinate dehydrogenase complex, subunit B, iron sulfur (lp) [*Mus musculus* (house mouse)]

Gene ID: 67680, updated on 5-Jan-2020

Summary

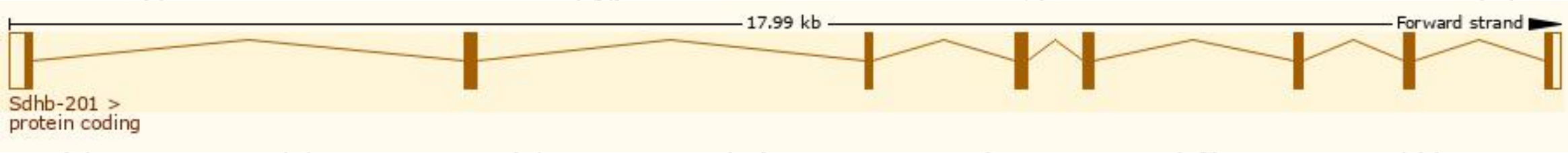
Official Symbol	Sdhb provided by MGI
Official Full Name	succinate dehydrogenase complex, subunit B, iron sulfur (lp) provided by MGI
Primary source	MGI:MGI:1914930
See related	Ensembl:ENSMUSG00000009863
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	0710008N11Rik
Expression	Ubiquitous expression in heart adult (RPKM 390.1), kidney adult (RPKM 243.7) and 28 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

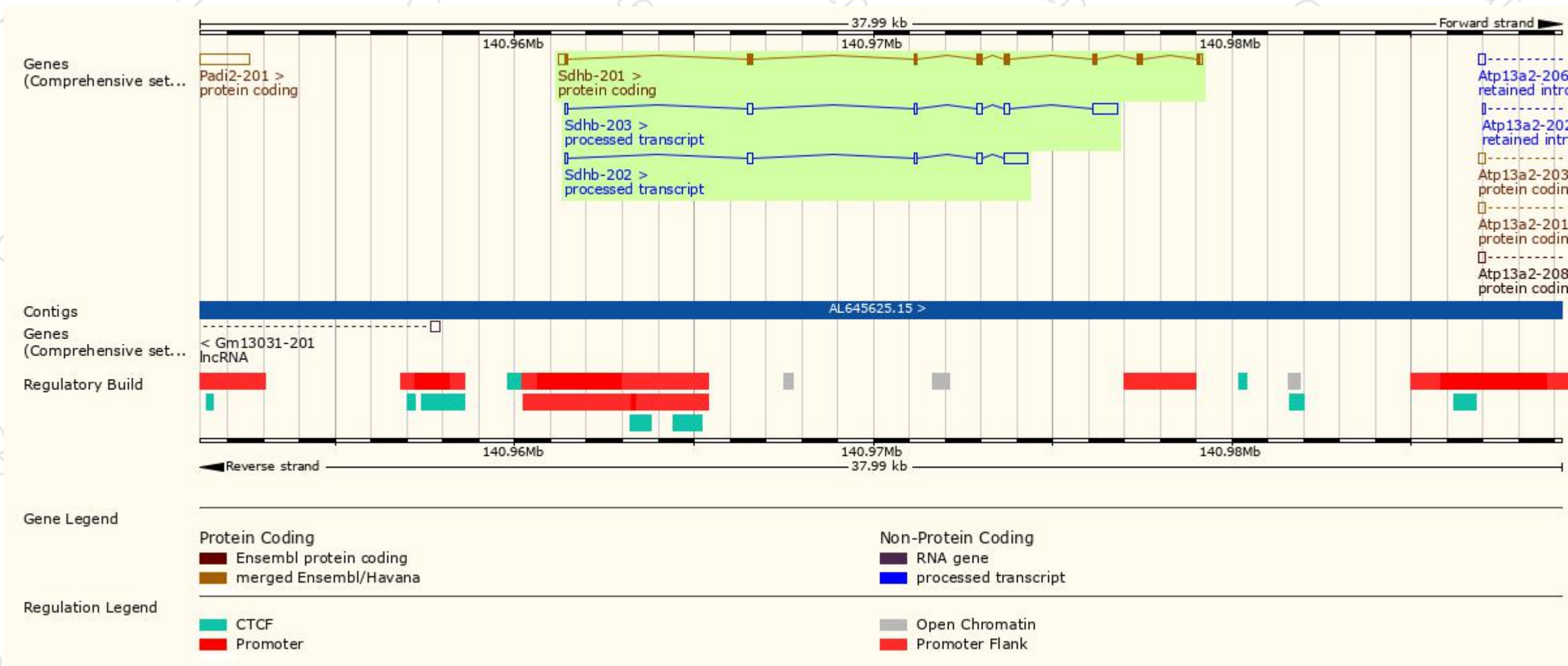
The gene has 3 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Sdhb-201	ENSMUST00000010007.8	1142	282aa	Protein coding	CCDS18858	Q9CQA3	TSL:1 GENCODE basic APPRIS P1
Sdhb-203	ENSMUST00000129181.7	1232	No protein	Processed transcript	-	-	TSL:2
Sdhb-202	ENSMUST00000125780.1	1065	No protein	Processed transcript	-	-	TSL:2

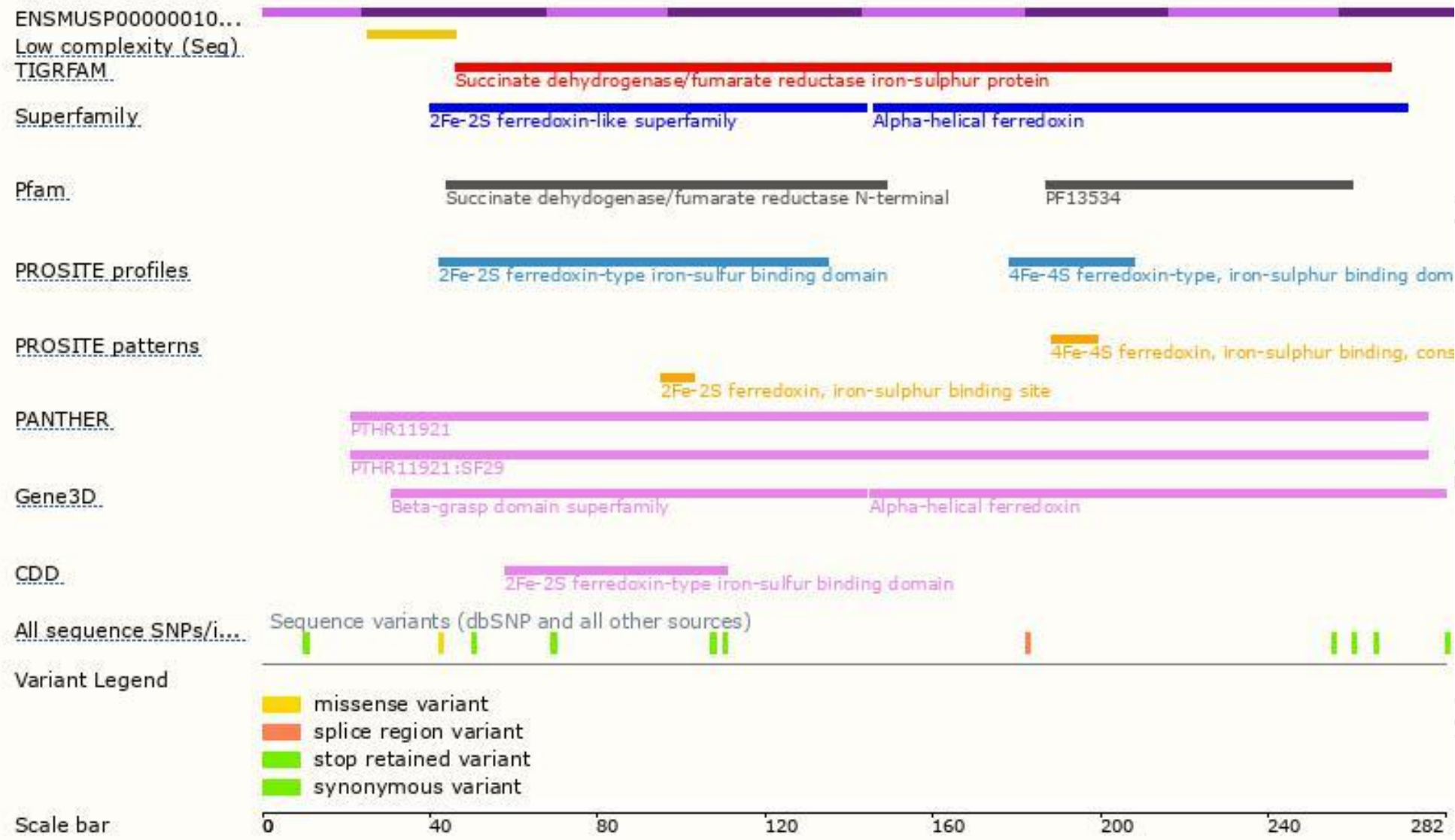
The strategy is based on the design of *Sdhb-201* transcript, the transcription is shown below:



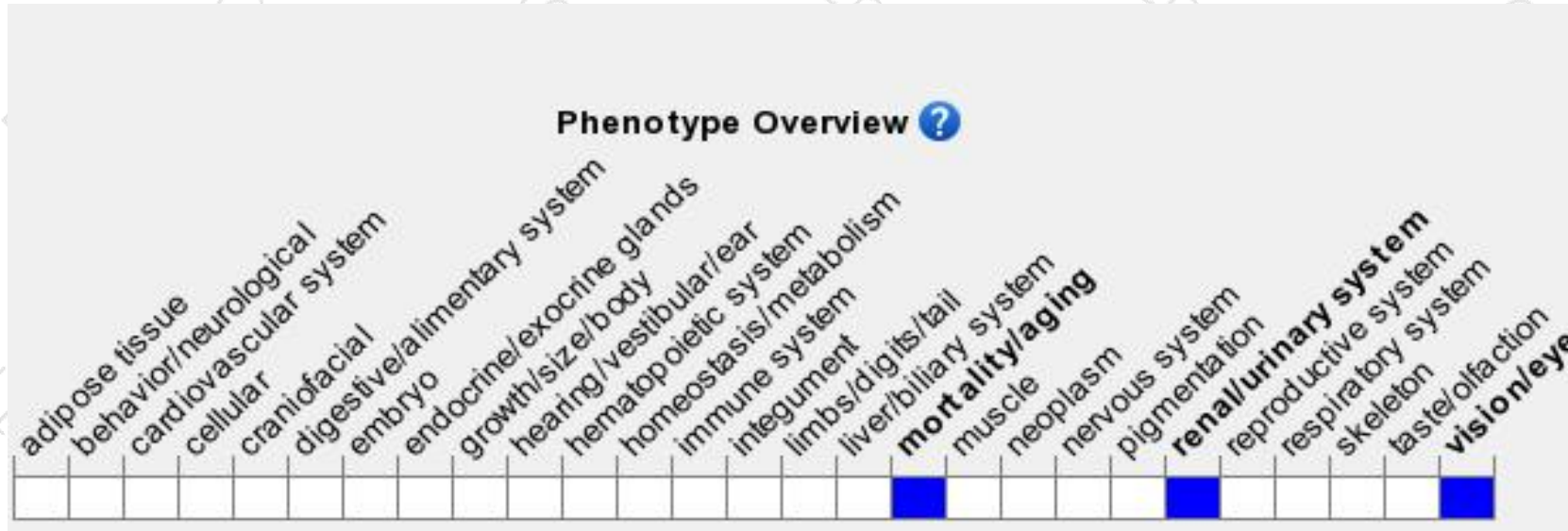
Genomic location distribution



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, The gene is involved in the hypoxia-induced RNA editing pathway in monocytes.

Heterozygous compound KOs show reduced increase in blood hemoglobin under hypoxic conditions. Homozygous inactivation of the gene results in complete embryonic lethality.

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

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