

# ***Sdhb*** Cas9-KO Strategy

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**Reviewer:**

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# Project Overview

**Project Name**

***Sdhb***

**Project type**

**Cas9-KO**

**Strain background**

**C57BL/6JGpt**

# 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 v

- 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 the gene knockout on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology 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

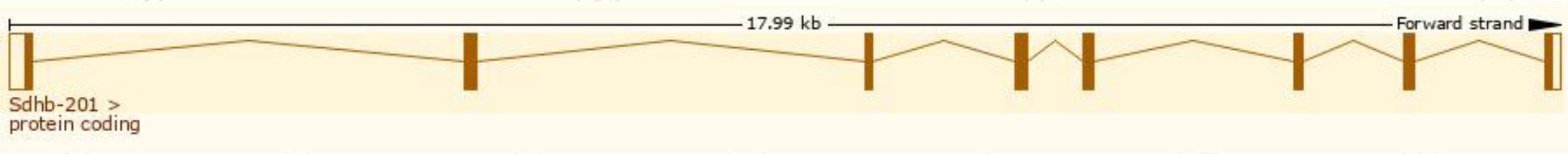
Official Symbol	Sdhb provided by <a href="#">MGI</a>
Official Full Name	succinate dehydrogenase complex, subunit B, iron sulfur (lp) provided by <a href="#">MGI</a>
Primary source	<a href="#">MGI:MGI:1914930</a>
See related	<a href="#">Ensembl:ENSMUSG000000009863</a>
Gene type	protein coding
RefSeq status	VALIDATED
Organism	<a href="#">Mus musculus</a>
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 <a href="#">See more</a>
Orthologs	<a href="#">human</a> <a href="#">all</a>

# Transcript information (Ensembl)

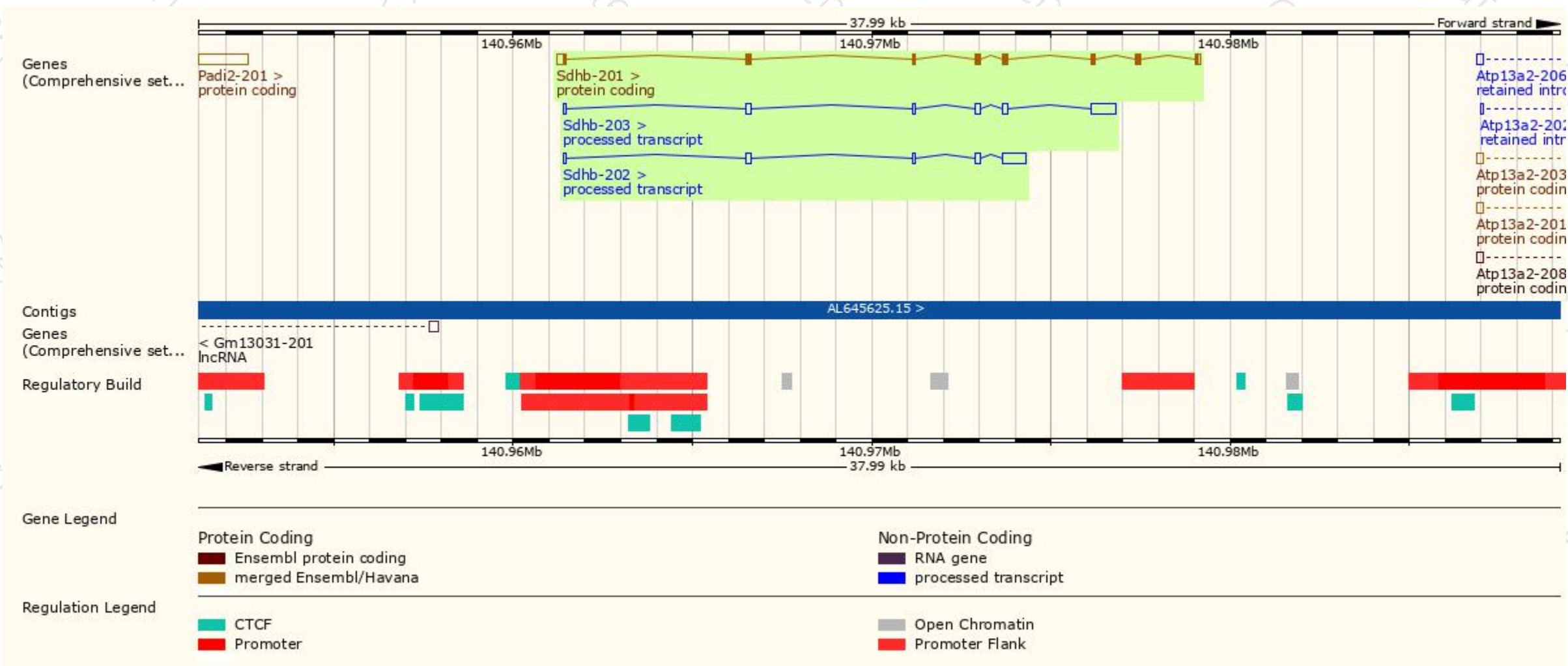
The gene has 3 transcripts,all transcripts are shown below:

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

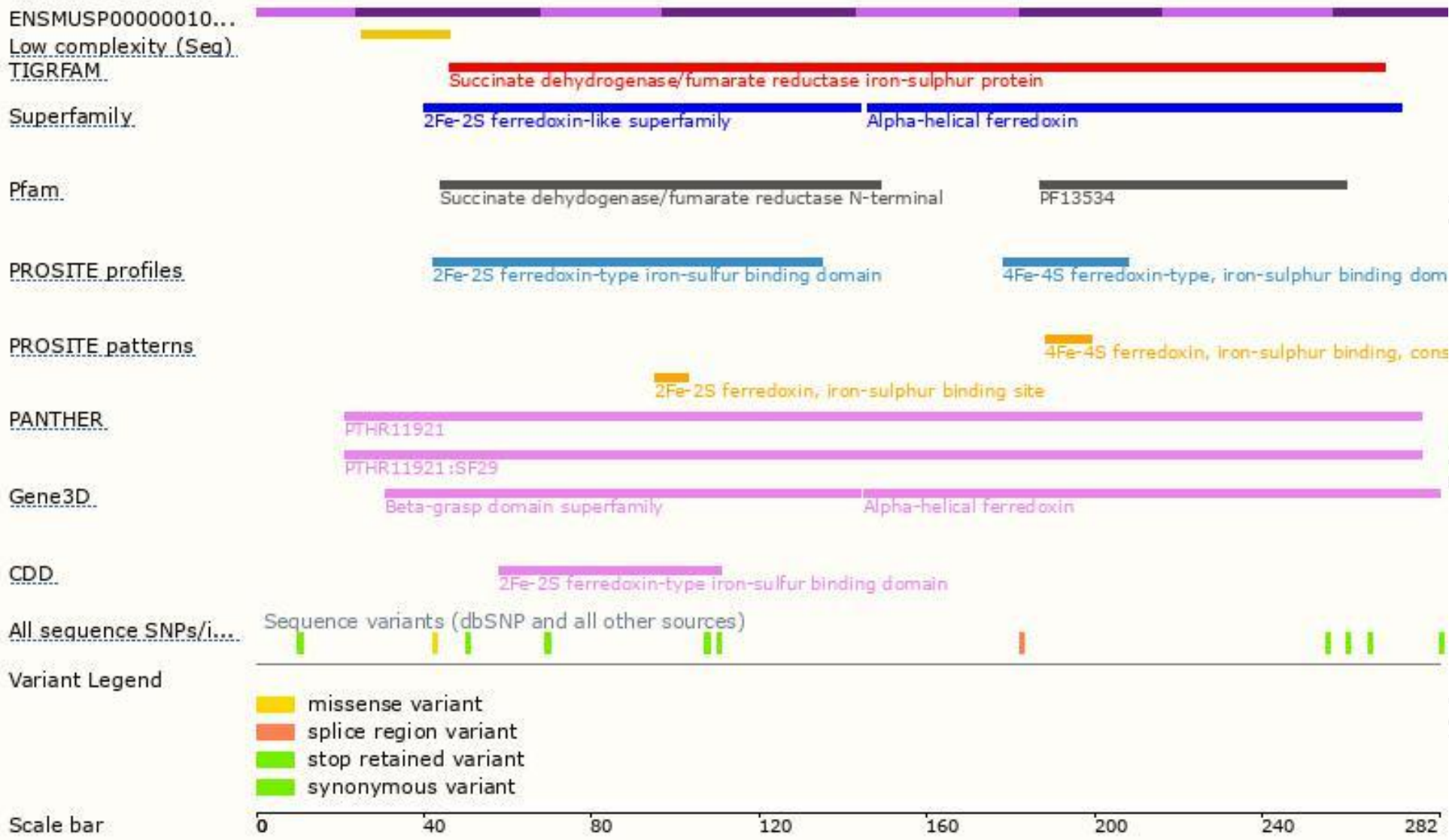




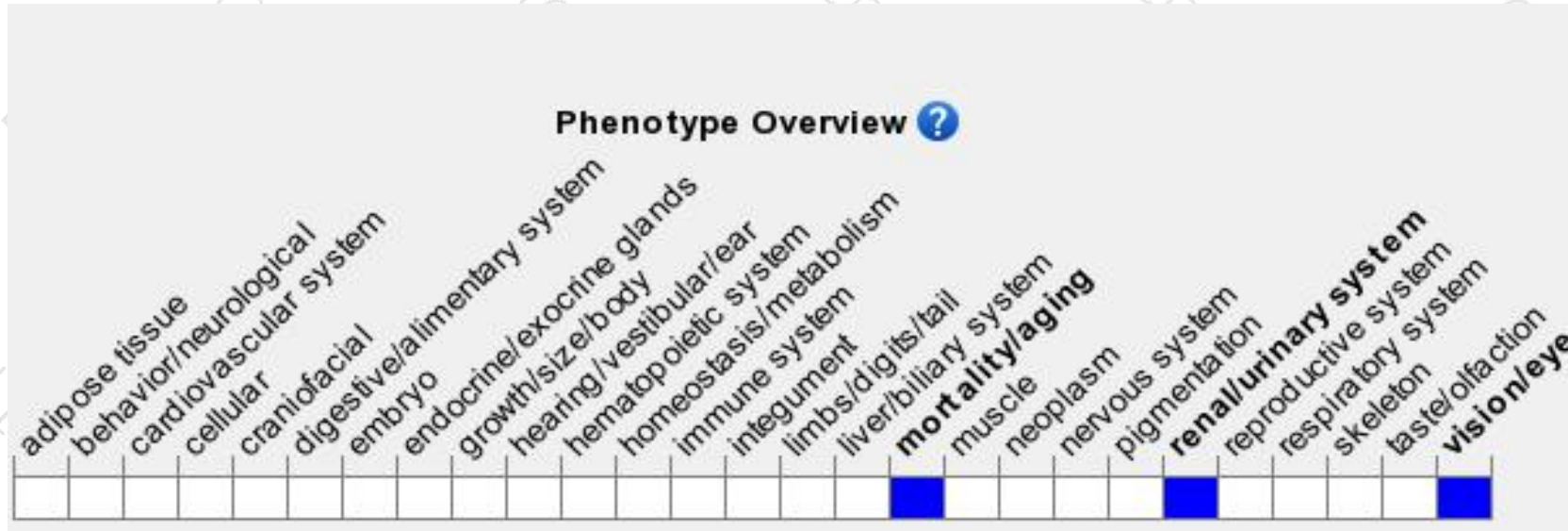
# Protein domain



集萃药康  
GemPharmatech



# 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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