Sod2 Cas9-KO *Strategy*

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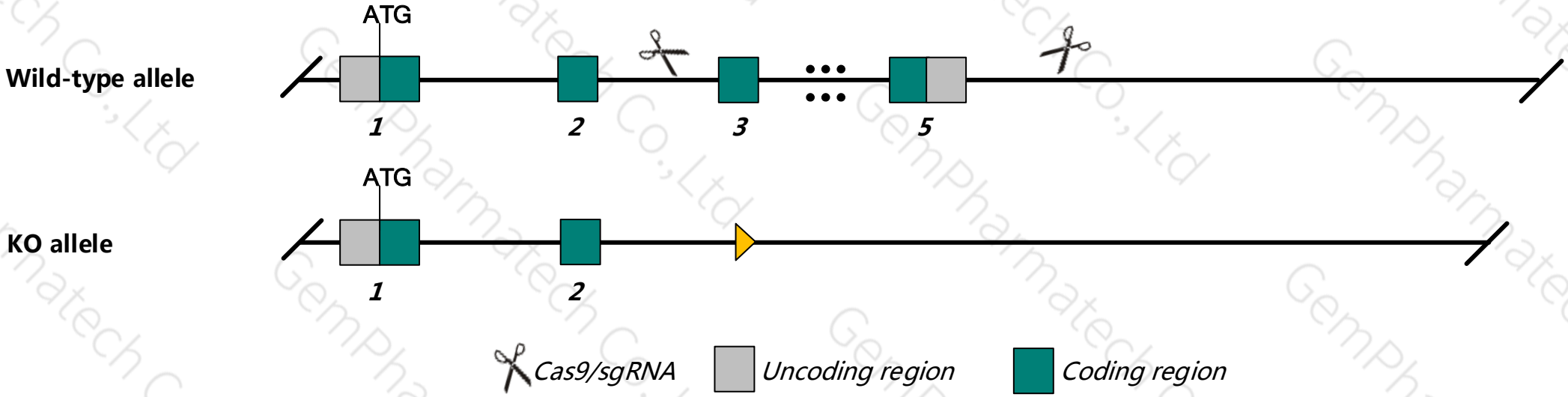
Project Overview

Project Name	*Sod2*
Project type	Cas9-KO
Animal background	C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the Sod2 gene. The schematic diagram is as follows:



Technical routes

- The *Sod2* gene has 8 transcripts.According to the structure of *Sod2* gene, exon3-exon5 of *Sod2*-201 transcript is recommended as the knockout region.The region contains most of the coding seqence.Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Sod2* 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.

Notice

- According to the existing MGI data，Mutations affect mitochondrial function. Null homozygotes die early with cardiomyopathy, tissue lipid accumulation, neurodegeneration, motor problems and/or metabolic acidosis depending on strain background. Heterozygotes show mitochondria and apoptosis defects with age.
- Transcript *Sod2-205* may not be affected.
- The *Sod2* gene is located on the Chr17. 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 gene transcription and translation processes, all risks cannot be predicted under existing information.

Gene information （NCBI）

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Sod2 superoxide dismutase 2, mitochondrial [*Mus musculus* (house mouse)]

Gene ID: 20656, updated on 23-Apr-2019

Summary

Official Symbol	Sod2 provided by MGI
Official Full Name	superoxide dismutase 2, mitochondrial provided by MGI
Primary source	MGI:MGI:98352
See related	Ensembl:ENSMUSG00000006818
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	MnSOD; Sod-2
Expression	Ubiquitous expression in heart adult (RPKM 82.2), adrenal adult (RPKM 81.7) and 28 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

The gene has 8 transcripts, and all transcripts are shown below ：

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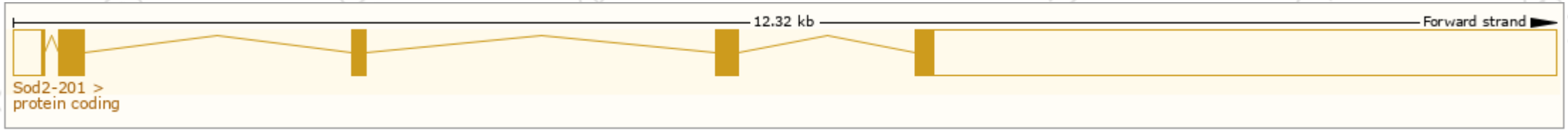
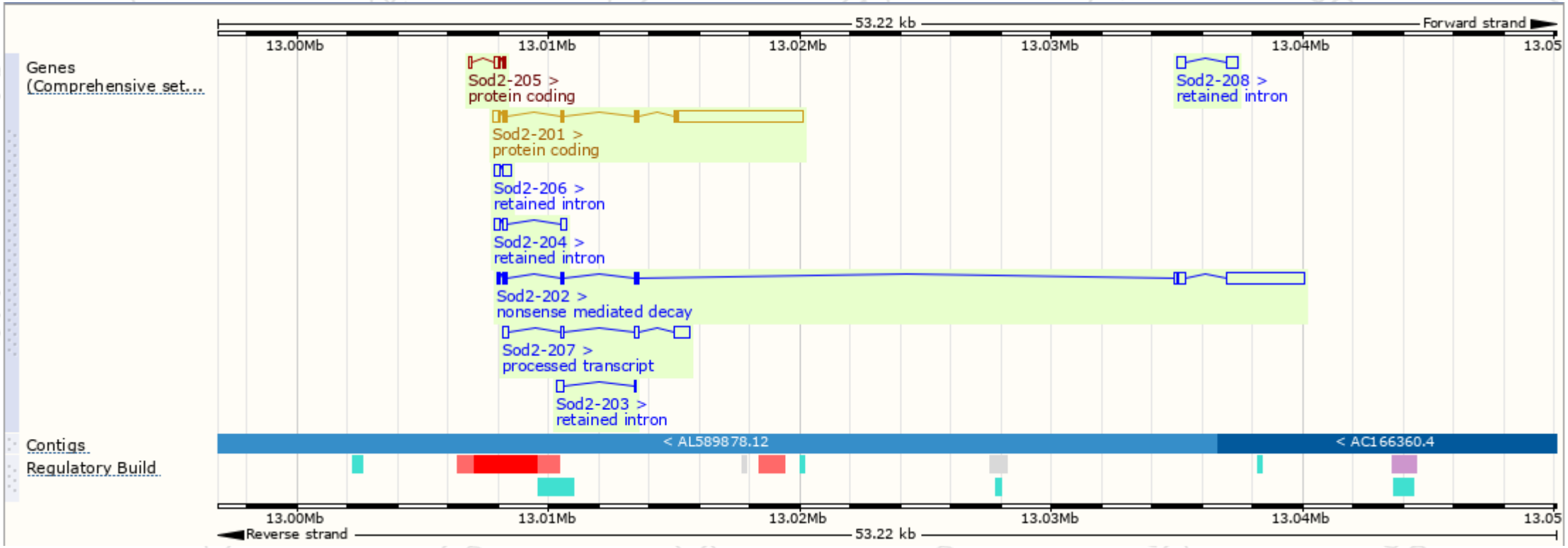
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Sod2-201	ENSMUST00000007012.5	5861	222aa	Protein coding	CCDS28399	P09671 Q4FJX9	TSL:1 GENCODE basic APPRIS P1
Sod2-205	ENSMUST00000233451.1	451	50aa	Protein coding	-	A0A3B2W479	CDS 3' incomplete
Sod2-202	ENSMUST00000232726.1	4057	182aa	Nonsense mediated decay	-	A0A3B2WBF0	-
Sod2-207	ENSMUST00000233897.1	1138	No protein	Processed transcript	-	-	-
Sod2-208	ENSMUST00000233922.1	804	No protein	Retained intron	-	-	-
Sod2-204	ENSMUST00000233333.1	644	No protein	Retained intron	-	-	-
Sod2-206	ENSMUST00000233791.1	584	No protein	Retained intron	-	-	-
Sod2-203	ENSMUST00000233278.1	334	No protein	Retained intron	-	-	-

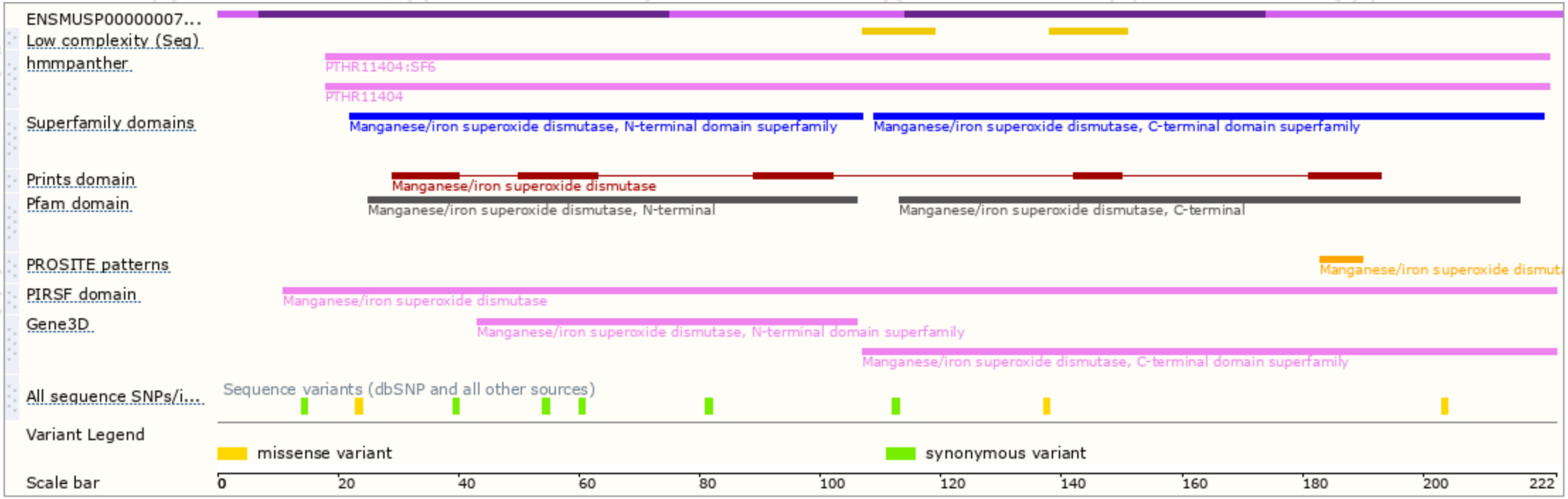
The strategy is based on the design of *Sod2*-201 transcript,The transcription is shown below



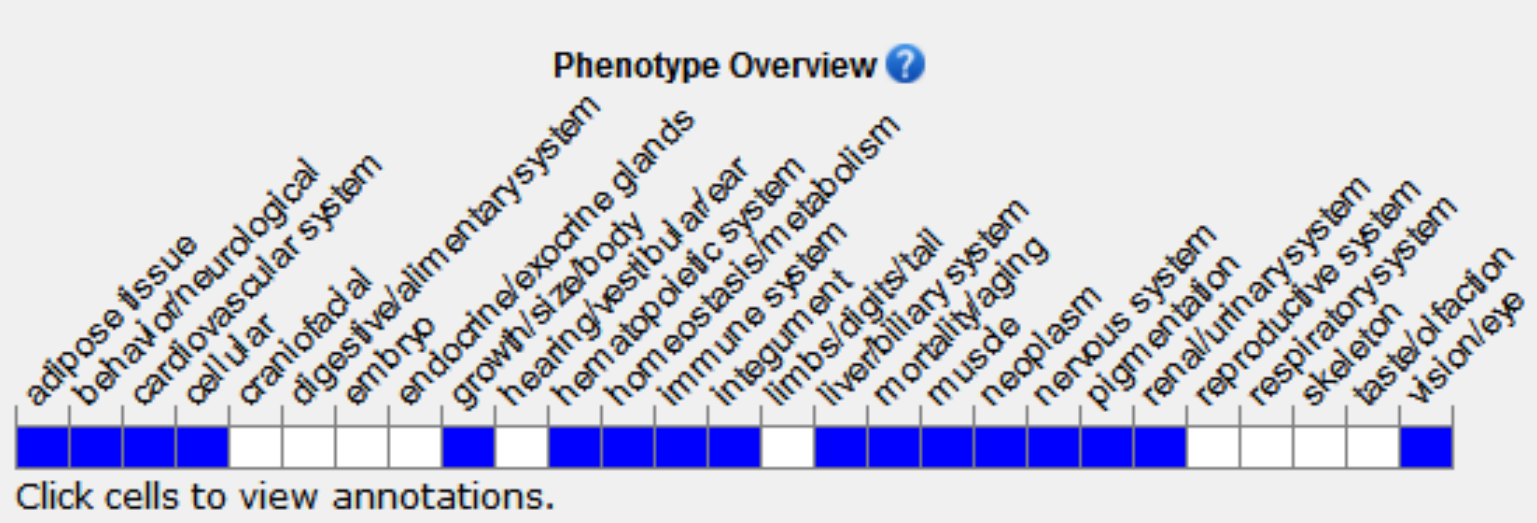
Genomic location distribution



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 affect mitochondrial function. Null homozygotes die early with cardiomyopathy, tissue lipid accumulation, neurodegeneration, motor problems and/or metabolic acidosis depending on strain background. Heterozygotes show mitochondria and apoptosis defects with age.

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

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