

Sod3 Cas9-CKO Strategy

Designer:

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Design Date:

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Project Overview

Project Name

Sod3

Project type

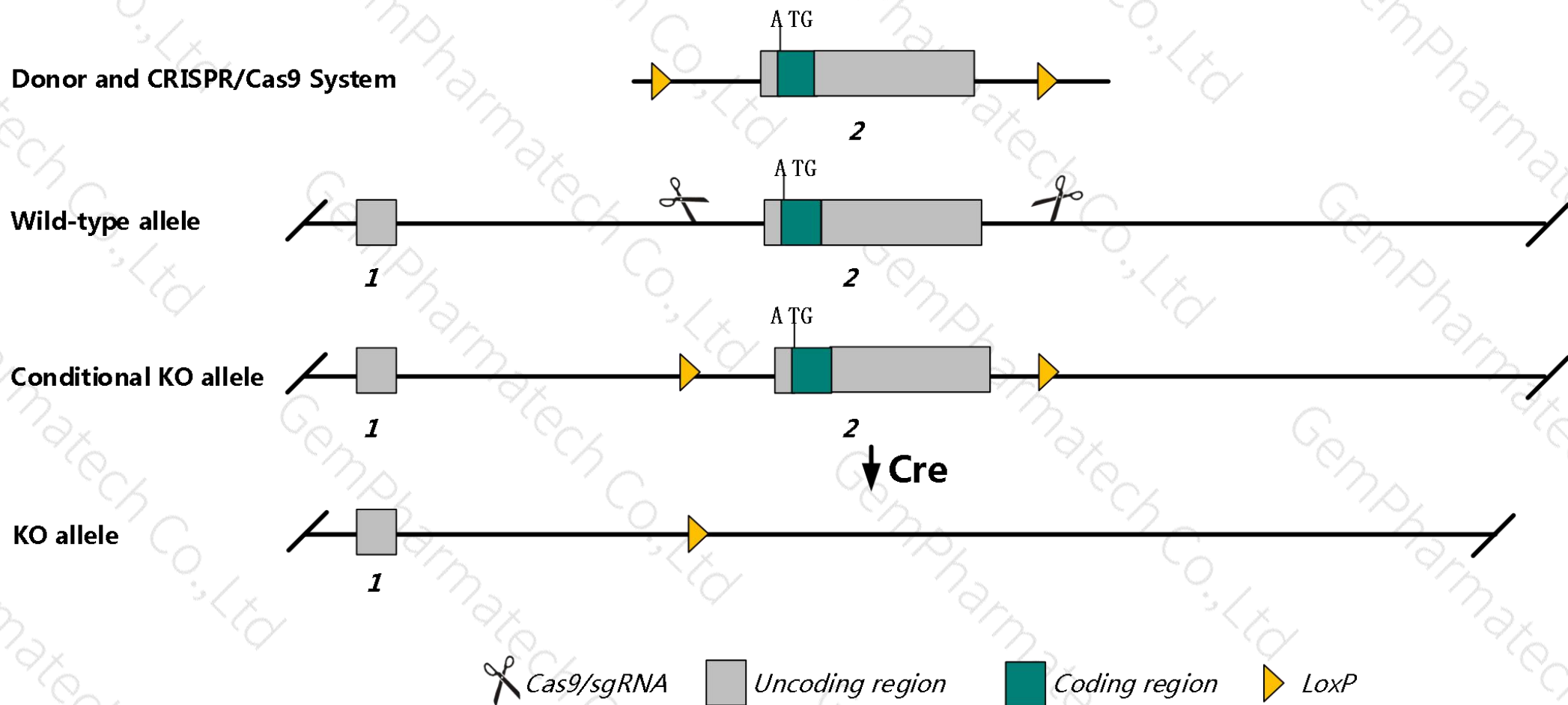
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Sod3* gene. The schematic diagram is as follows:



- The *Sod3* gene has 1 transcripts. According to the structure of *Sod3* gene, exon2 of *Sod3*-201 (ENSMUST00000162415.8) transcript is recommended as the knockout region. The region contains all coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Sod3* gene. The brief process is as follows: gRNA was transcribed in vitro, donor was constructed. Cas9, gRNA 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 or cell types.

- According to the existing MGI data , Mice homozygous for a knock-out allele exhibit increased sensitivity to hyperoxia, increased LPS-stimulated spleen production of TNF, and enhanced severity of collagen-induced arthritis.
- The *Sod3* gene is located on the Chr5. 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

Gene information (NCBI)

Sod3 superoxide dismutase 3, extracellular [*Mus musculus* (house mouse)]

Gene ID: 20657, updated on 19-Mar-2019

Summary

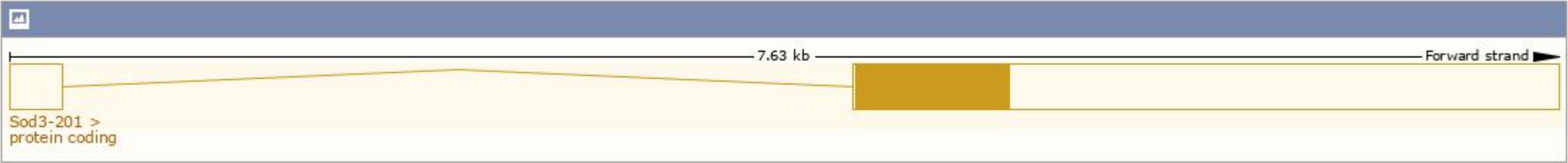
Official Symbol	Sod3 provided by MGI
Official Full Name	superoxide dismutase 3, extracellular provided by MGI
Primary source	MGI:MGI:103181
See related	Ensembl:ENSMUSG00000072941
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	EC-SOD; AI314465
Expression	Biased expression in adrenal adult (RPKM 494.2), lung adult (RPKM 264.4) and 10 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

The gene has 1 transcript, and the transcript is:

Show/hide columns (1 hidden)							Filter		
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags		
Sod3-201	ENSMUST00000101208.5	3738	251aa	Protein coding	CCDS19283	O09164 Q542X9	TSL:1	GENCODE basic	APPRIS P1

The strategy is based on the design of *Sod3-201* transcript, The transcription is shown below

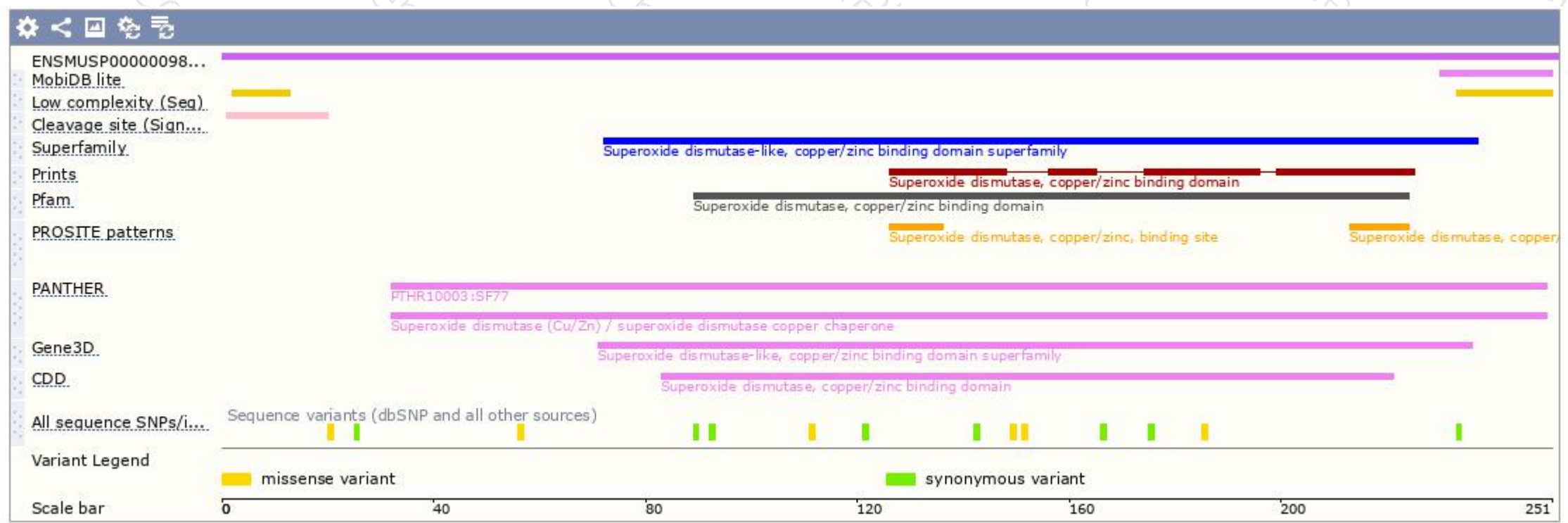


Statistics Exons: 2, Coding exons: 1, Transcript length: 3,738 bps, Translation length: 251 residues

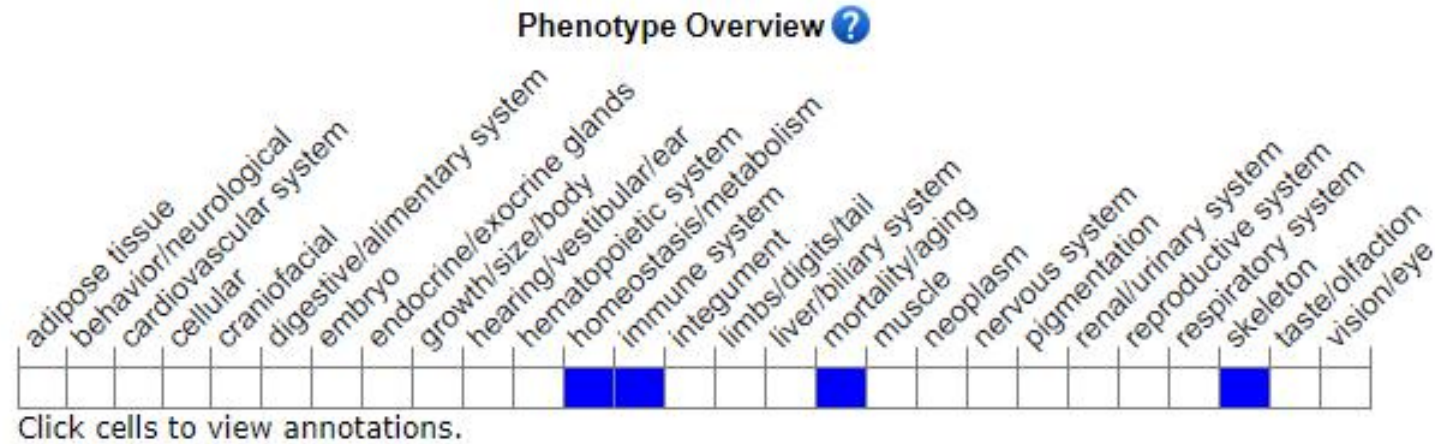
Genomic location distribution



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/>) .

Mice homozygous for a knock-out allele exhibit increased sensitivity to hyperoxia, increased LPS-stimulated spleen production of TNF, and enhanced severity of collagen-induced arthritis.

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