Sox1 Cas9-KO *Strategy*

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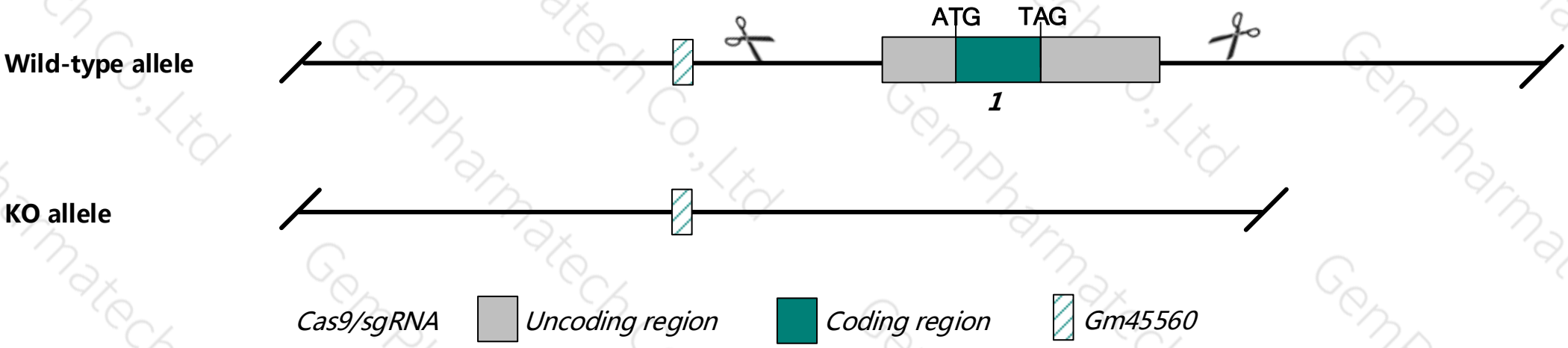
Project Overview

Project Name	***Sox1***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Sox1* gene. The schematic diagram is as follows:



Technical routes

- The *Sox1* gene has 1 transcript. According to the structure of *Sox1* gene, exon1 of *Sox1*-201 (ENSMUST00000180353.1)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 *Sox1* 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，homozygous null mutants exhibit lens opacity associated with a lack of gamma crystallin expression, microphthalmia, episodic seizures, sexual dysfunction, impaired maternal nurturing, and reduced lifespan.
- The KO region contains part of intron of the *Sox1ot* gene. Knockout the region may affect the splicing regulation function of *Sox1ot* gene.
- The KO region contains functional region of the *Gm25239* gene. Knockout the region may affect the function of *Gm25239* gene.
- The *Sox1* gene is located on the Chr8. 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）

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Sox1 SRY (sex determining region Y)-box 1 [*Mus musculus* (house mouse)]

Gene ID: 20664, updated on 10-Oct-2019

Summary

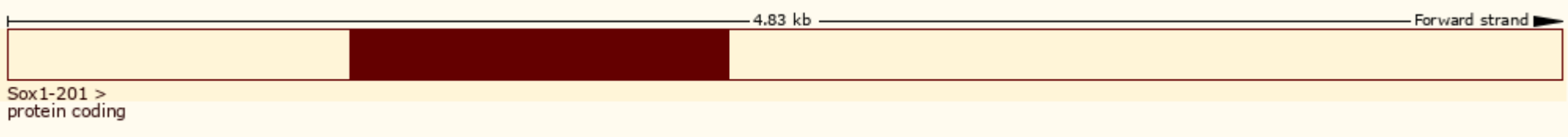
Official Symbol	Sox1 provided by MGI
Official Full Name	SRY (sex determining region Y)-box 1 provided by MGI
Primary source	MGI:MGI:98357
See related	Ensembl:ENSMUSG00000096014
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Sox-1; BB176347
Orthologs	human all

Transcript information（ Ensembl ）

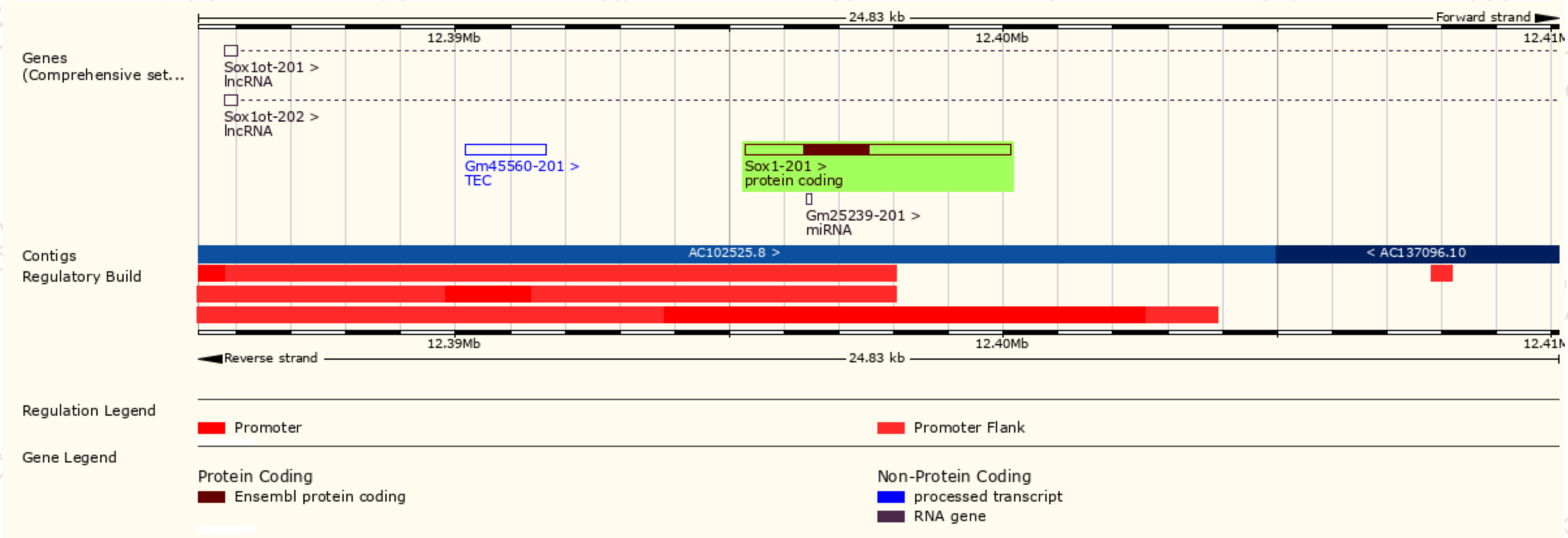
The gene has 1 transcript, and all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Sox1-201	ENSMUST00000180353.1	4832	391aa	Protein coding	CCDS57605	P53783	TSL:NA GENCODE basic APPRIS P1

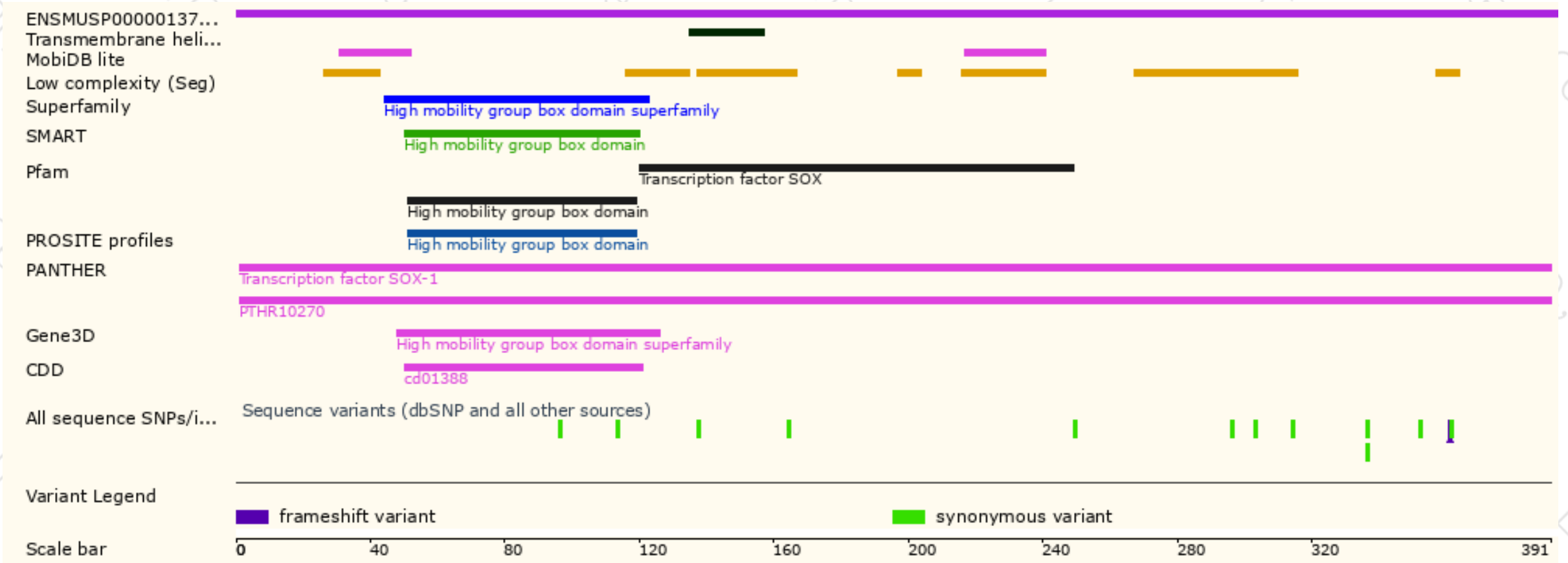
The strategy is based on the design of *Sox1-201* transcript,the transcription is shown below:



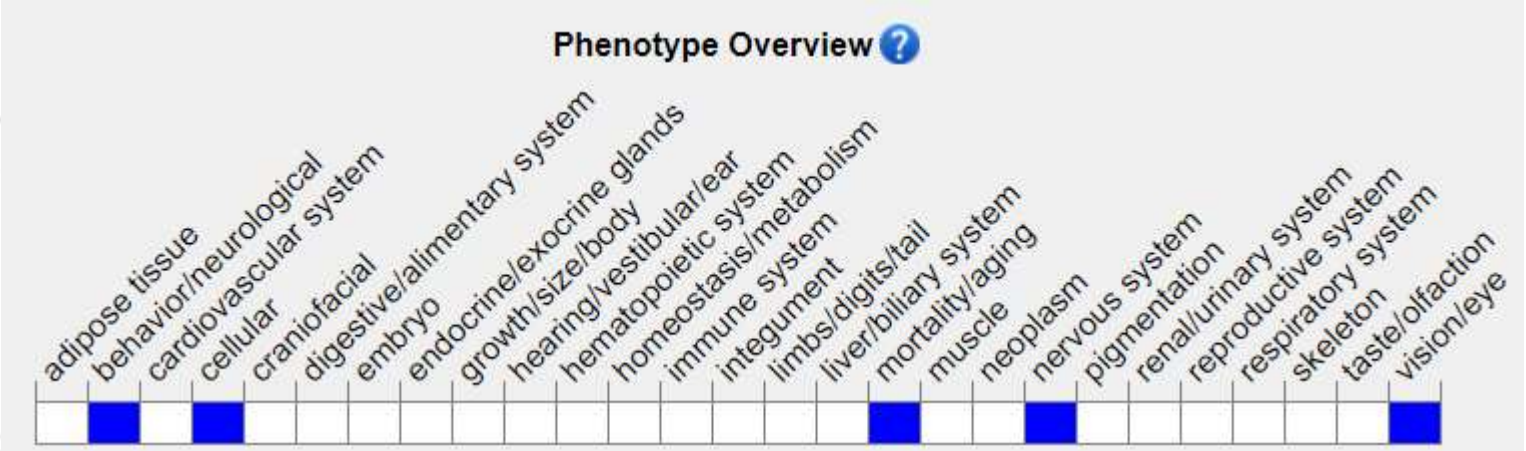
Genomic location (Ensembl)



Protein domain（Ensembl）



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, homozygous null mutants exhibit lens opacity associated with a lack of gamma crystallin expression, microphthalmia, episodic seizures, sexual dysfunction, impaired maternal nurturing, and reduced lifespan.

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

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