Sox5 Cas9-KO Strategy

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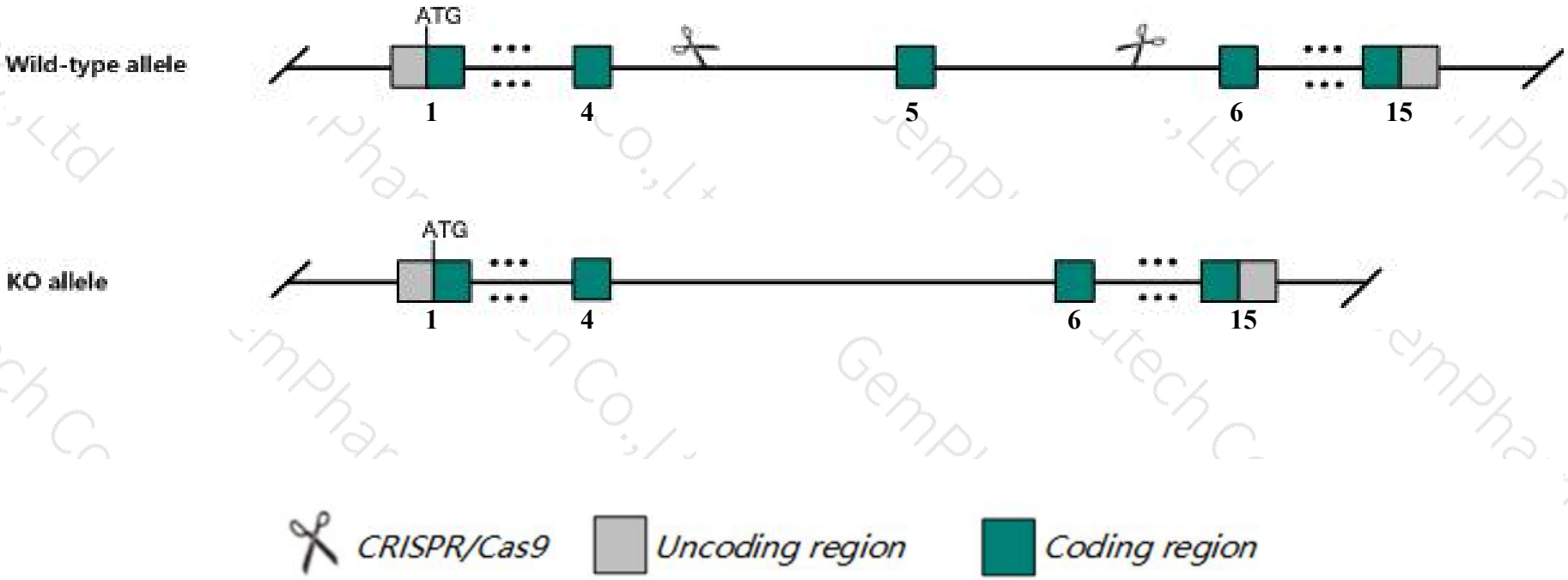
Project Overview

Project Name	***Sox5***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Sox5* gene. The schematic diagram is as follows:



Technical routes

➢ The *Sox5* gene has 14 transcripts. According to the structure of *Sox5* gene, exon5 of *Sox5-201* (ENSMUST00000038815.13) transcript is recommended as the knockout region.The region contains 173bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Sox5* gene. The brief process is as follows: CRISPR/Cas9 system v

Notice

- According to the existing MGI data,Homozygous null mice fail to breathe and die at birth exhibiting a narrow thoracic cage, irregularly mineralized sternum, cleft secondary palate, and delayed bone mineralization. Homozygotes for a transposon induced insertion die shortly after birth exhibiting cyanosis and respiratory distress.
- Transcript *Sox5*-203&204&206&208&211&212&213 may not be affected.
- The N-terminal of *Sox5* gene will remain 190aa,it may remain the partial function of *Sox5* gene.
- The *Sox5* gene is located on the Chr6. 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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Sox5 SRY (sex determining region Y)-box 5 [*Mus musculus* (house mouse)]

Gene ID: 20678, updated on 3-Sep-2019

Summary

Official Symbol	Sox5 provided by MGI
Official Full Name	SRY (sex determining region Y)-box 5 provided by MGI
Primary source	MGI:MGI:98367
See related	Ensembl:ENSMUSG00000041540
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	AI528773; A730017D01Rik
Expression	Broad expression in whole brain E14.5 (RPKM 6.6), testis adult (RPKM 6.4) and 17 other tissues See more
Orthologs	human all

Genomic context

Location: 6 G3; 6 76.14 cM

See Sox5 in Genome Data Viewer

Exon count: 24

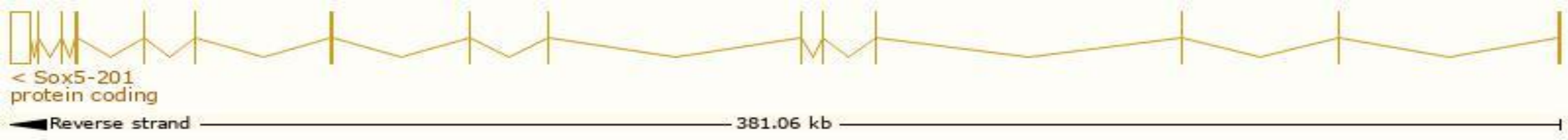
Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	6	NC_000072.6 (143828425..144782287, complement)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	6	NC_000072.5 (143781349..144158078, complement)

Transcript information（Ensembl）

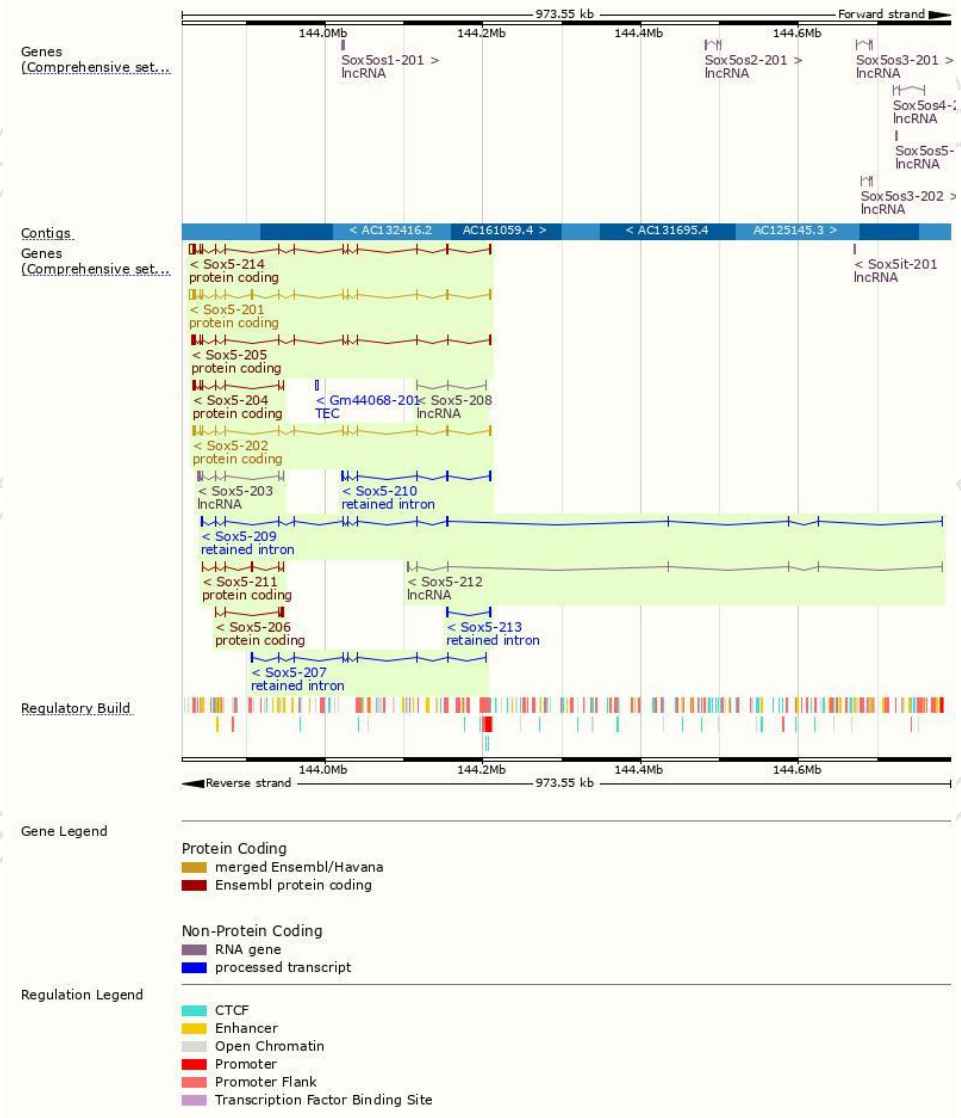
The gene has 14 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Sox5-201	ENSMUST00000038815.13	7243	763aa	Protein coding	CCDS39702	B2KFM9	TSL:1 GENCODE basic APPRIS P1
Sox5-205	ENSMUST00000111749.7	3879	679aa	Protein coding	CCDS57469	B2KFM4	TSL:1 GENCODE basic
Sox5-202	ENSMUST00000077160.11	2526	715aa	Protein coding	CCDS51954	Q2TBA9	TSL:1 GENCODE basic
Sox5-204	ENSMUST00000111748.7	1734	392aa	Protein coding	CCDS85183	P35710 Q3TVF9	TSL:1 GENCODE basic
Sox5-214	ENSMUST00000170367.8	7184	714aa	Protein coding	-	E9PVR0	TSL:5 GENCODE basic
Sox5-211	ENSMUST00000144289.3	669	184aa	Protein coding	-	B2KFM7	CDS 3' incomplete TSL:5
Sox5-206	ENSMUST00000124233.6	614	135aa	Protein coding	-	B2KFM8	CDS 3' incomplete TSL:5
Sox5-210	ENSMUST00000142294.7	2949	No protein	Retained intron	-	-	TSL:1
Sox5-209	ENSMUST00000141102.7	2791	No protein	Retained intron	-	-	TSL:1
Sox5-207	ENSMUST00000129050.7	2470	No protein	Retained intron	-	-	TSL:1
Sox5-213	ENSMUST00000150087.1	633	No protein	Retained intron	-	-	TSL:3
Sox5-212	ENSMUST00000149451.7	1942	No protein	lncRNA	-	-	TSL:1
Sox5-203	ENSMUST00000111746.7	1244	No protein	lncRNA	-	-	TSL:1
Sox5-208	ENSMUST00000139478.1	351	No protein	lncRNA	-	-	TSL:3

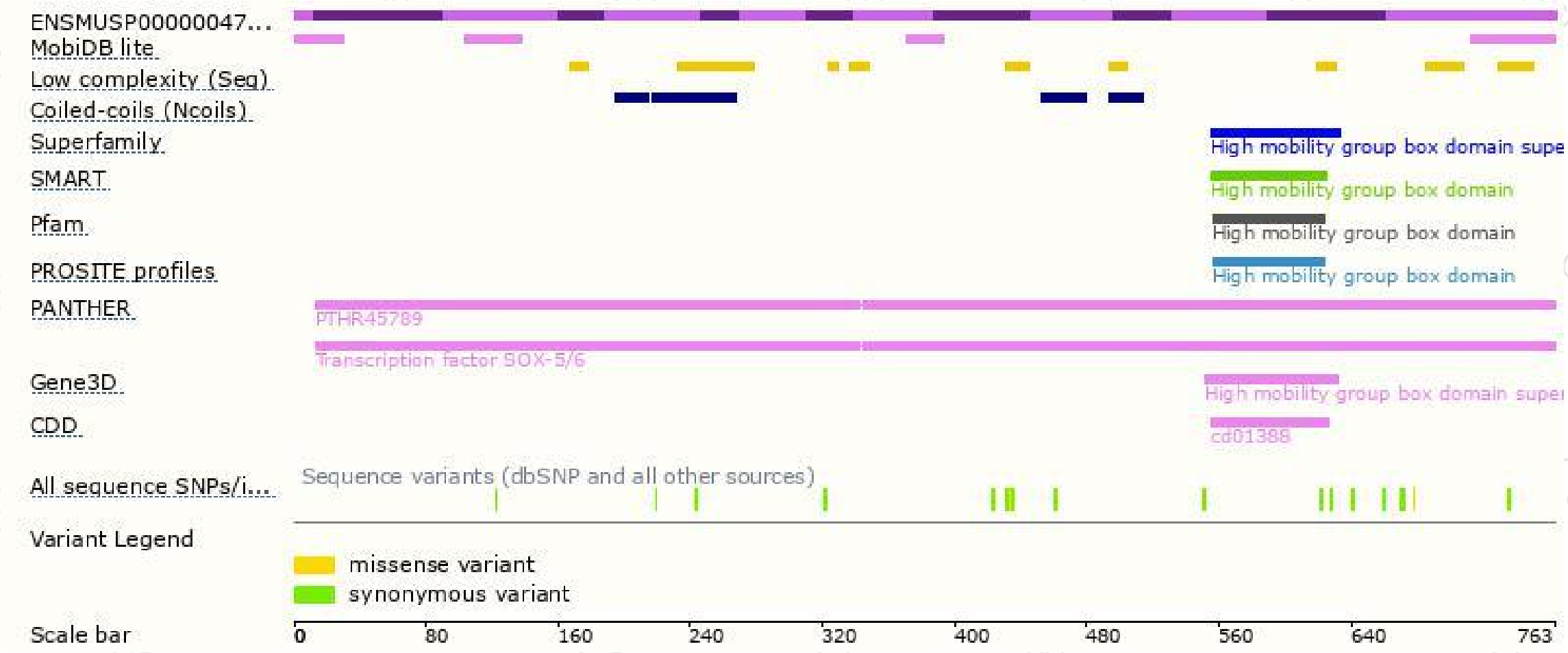
The strategy is based on the design of *Sox5-201* transcript,The transcription is shown below



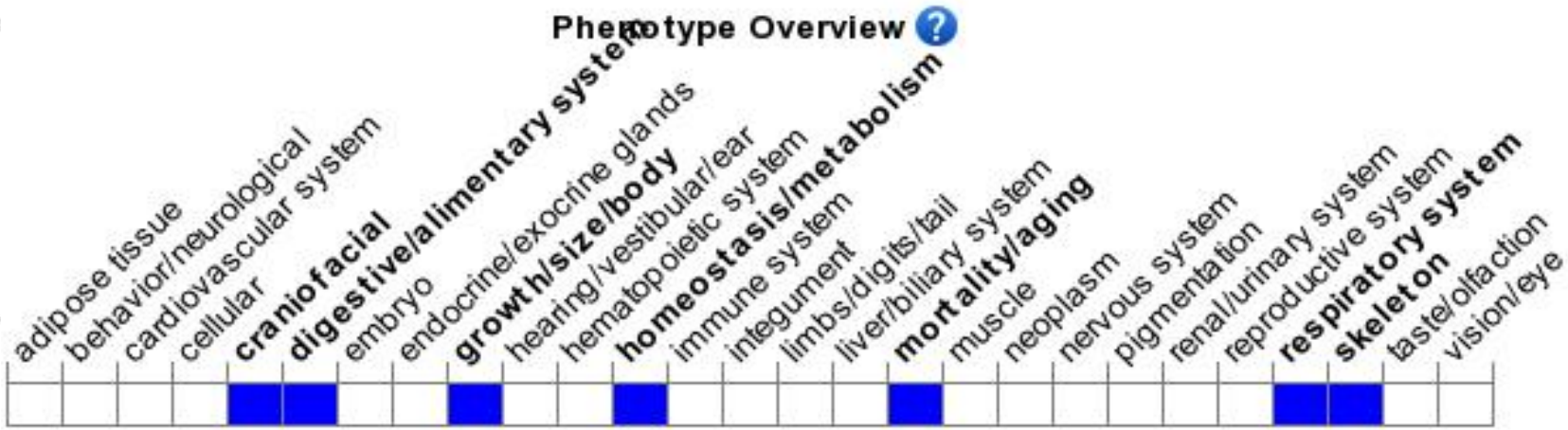
Genomic location distribution



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/).

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

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