

***Hoxc4* Cas9-KO Strategy**

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Project Overview

Project Name

Hoxc4

Project type

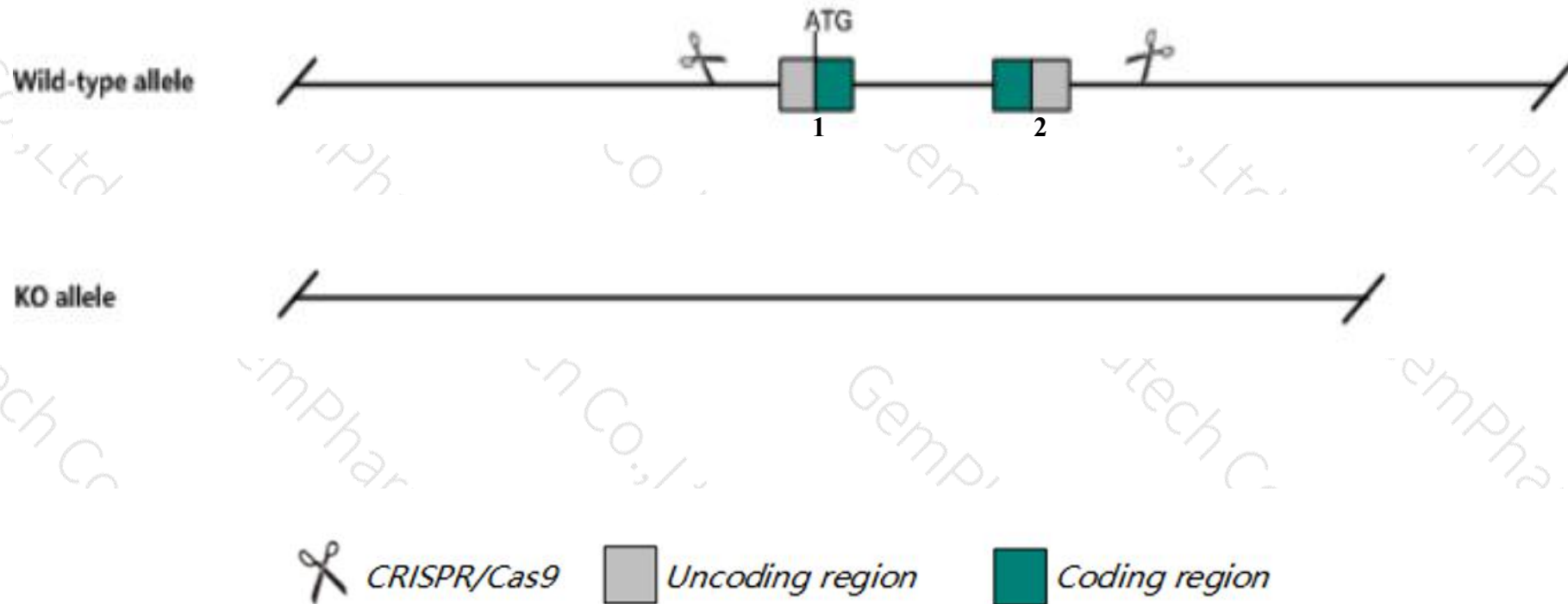
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Hoxc4* gene. The schematic diagram is as follows:



- The *Hoxc4* gene has 2 transcripts. According to the structure of *Hoxc4* gene, exon1-exon2 of *Hoxc4-201* (ENSMUST00000100164.4) transcript is recommended as the knockout region. The region contains all of the coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Hoxc4* gene. The brief process is as follows: CRISPR/Cas9 system

- According to the existing MGI data, mice homozygous for a knock-out allele exhibit some postnatal lethality (in the case of one allele but not the other), transformations of thoracic vertebrae, and abnormal rib attachment and sternum morphology.
- The *Hoxc4* gene is located on the Chr15. 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)

Hoxc4 homeobox C4 [*Mus musculus* (house mouse)]

Gene ID: 15423, updated on 13-Mar-2020

Summary

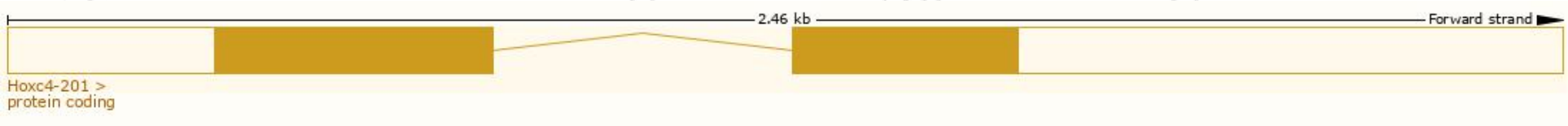
Official Symbol	Hoxc4 provided by MGI
Official Full Name	homeobox C4 provided by MGI
Primary source	MGI:MGI:96195
See related	Ensembl:ENSMUSG000000075394
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Hox-3.5
Expression	Broad expression in CNS E11.5 (RPKM 2.2), ovary adult (RPKM 1.9) and 16 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

The gene has 2 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Hoxc4-201	ENSMUST00000100164.4	1983	264aa	Protein coding	CCDS27897	Q08624	TSL:1 GENCODE basic APPRIS P1
Hoxc4-202	ENSMUST00000165375.2	2121	151aa	Protein coding	-	G3UX59	TSL:1 GENCODE basic

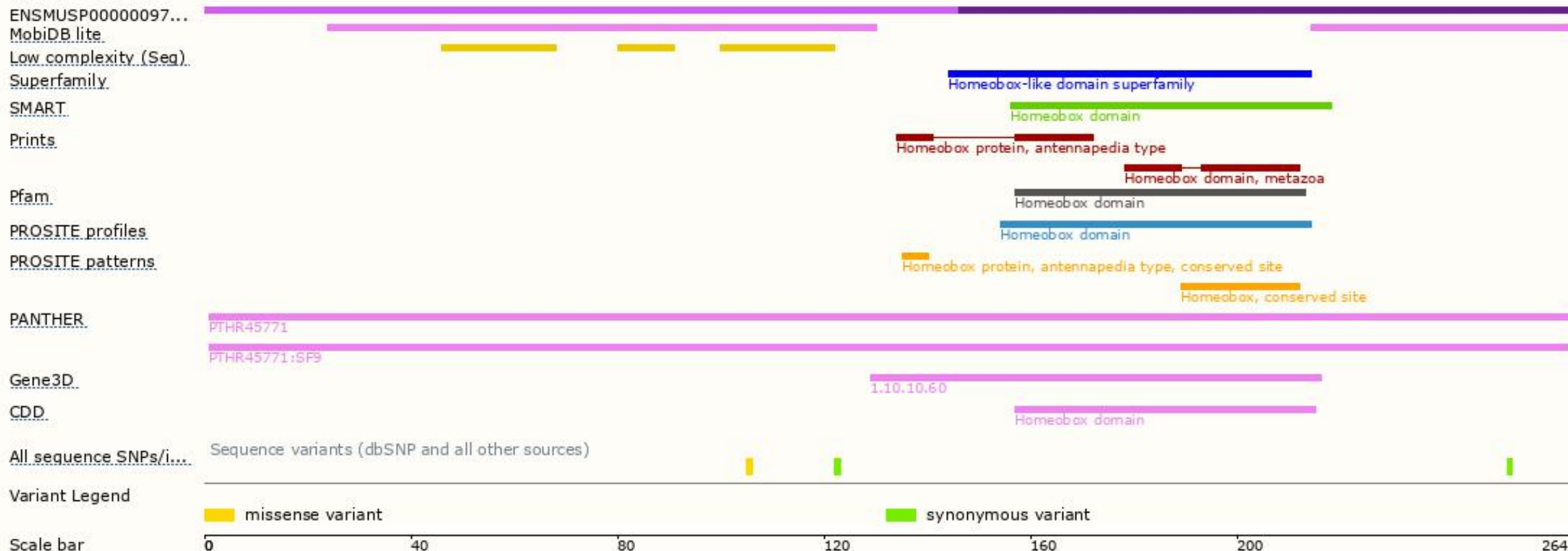
The strategy is based on the design of *Hoxc4-201* transcript, the transcription is shown below



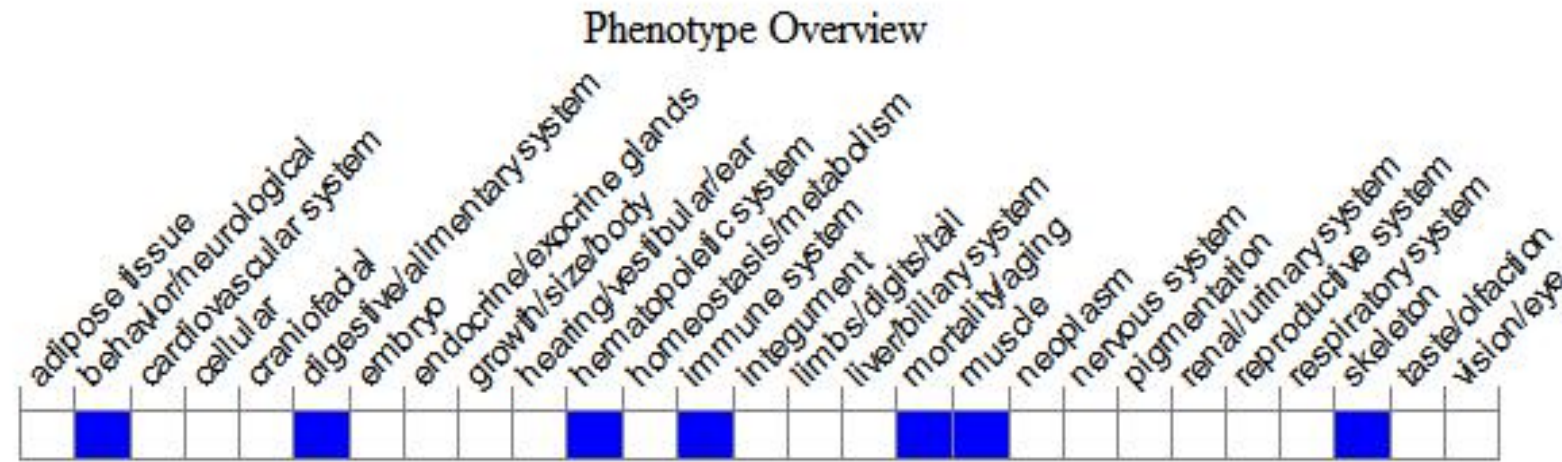
Genomic location distribution



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, mice homozygous for a knock-out allele exhibit some postnatal lethality (in the case of one allele but no the other), transformations of thoracic vertebrae, and abnormal rib attachment and sternebra morphology.

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

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