

Hoxc9 Cas9-CKO Strategy

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Reviewer:

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Project Overview

Project Name

Hoxc9

Project type

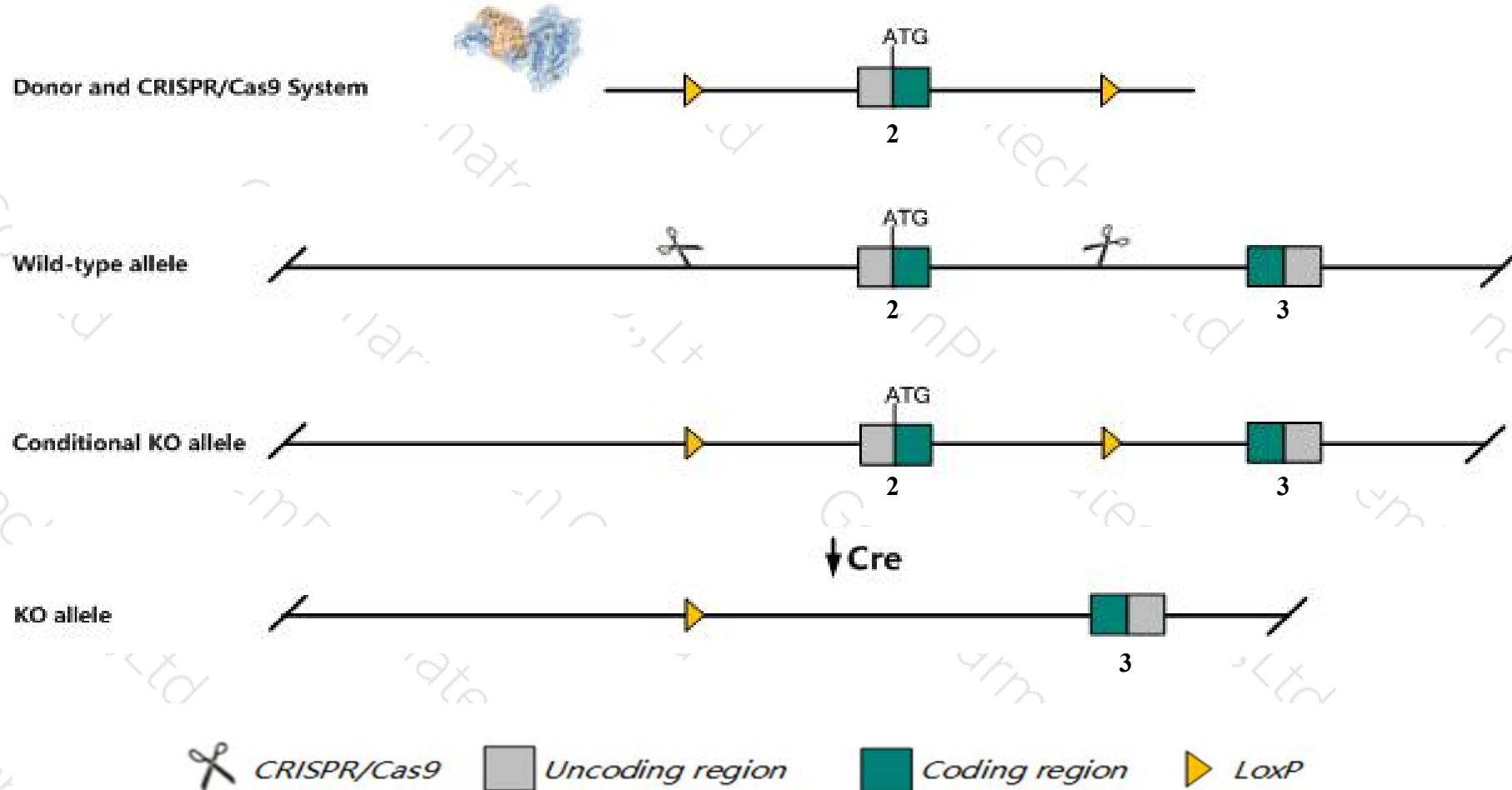
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Hoxc9* gene. The schematic diagram is as follows:



Technical routes

- The *Hoxc9* gene has 2 transcripts. According to the structure of *Hoxc9* gene, exon2 of *Hoxc9-201* (ENSMUST00000001706.6) transcript is recommended as the knockout region. The region contains start codon ATG. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Hoxc9* gene. The brief process is as follows: CRISPR/Cas9 system 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 and cell types.

- According to the existing MGI data, Mice homozygous for disruptions in this gene grow more slowly than normal and develop hunched backs. Forward transformations seen in vertebrae from L1 and forward to around T10. Abnormalities in the sternum and ribs attachments to the sternum are also seen.
- The Floxed region overlaps with intron1 of *Hoxc5-202* transcript. Knockout the region may affect the function of *Hoxc5-202* transcript.
- The *Hoxc9* 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at existing technological level.

Gene information (NCBI)

Hoxc9 homeobox C9 [*Mus musculus* (house mouse)]

Gene ID: 15427, updated on 12-Nov-2019

Summary

Official Symbol	Hoxc9 provided by MGI
Official Full Name	homeobox C9 provided by MGI
Primary source	MGI:MGI:96199
See related	Ensembl:ENSMUSG00000036139
Gene type	protein coding
RefSeq status	PROVISIONAL
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-3.2
Expression	Biased expression in ovary adult (RPKM 7.9), mammary gland adult (RPKM 7.9) and 7 other tissues See more
Orthologs	human all

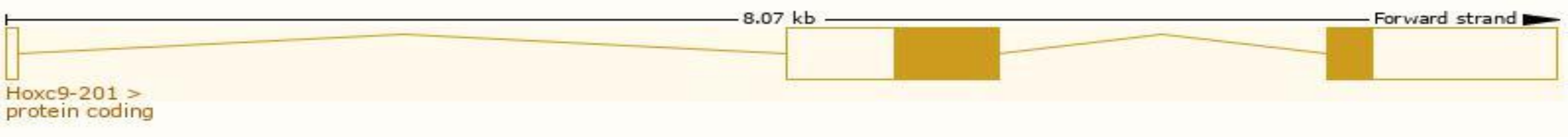


Transcript information (Ensembl)

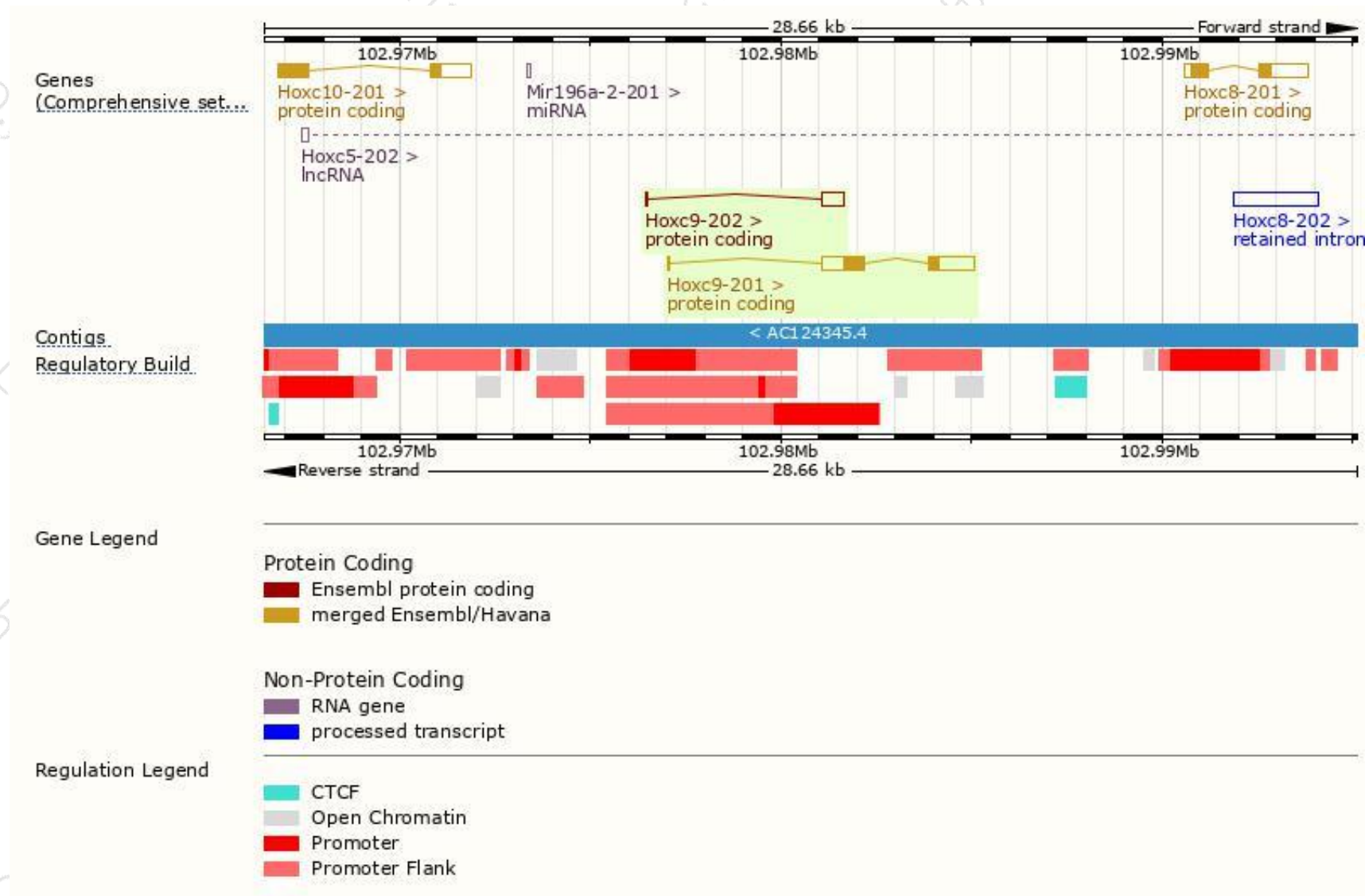
The gene has 2 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Translation ID	Biotype	CCDS	UniProt	Flags
Hoxc9-201	ENSMUST00000001706.6	2374	260aa	ENSMUSP000000001706.6	Protein coding	CCDS27893	P09633	TSL:1 GENCODE basic APPRIS P1
Hoxc9-202	ENSMUST00000173306.1	634	5aa	ENSMUSP00000134197.1	Protein coding	-	-	CDS 3' incomplete TSL:3

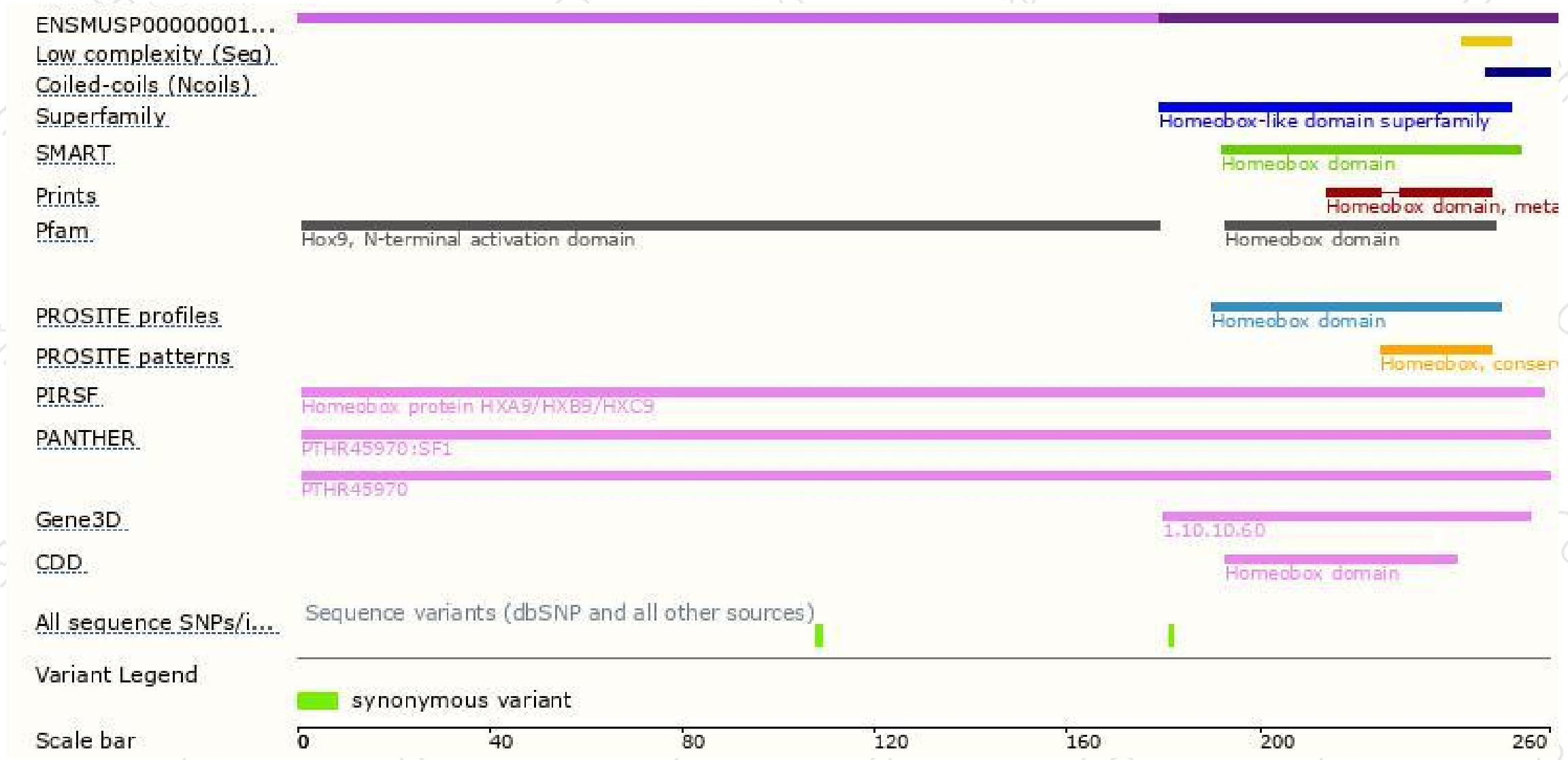
The strategy is based on the design of *Hoxc9-201* transcript,The transcription is shown below



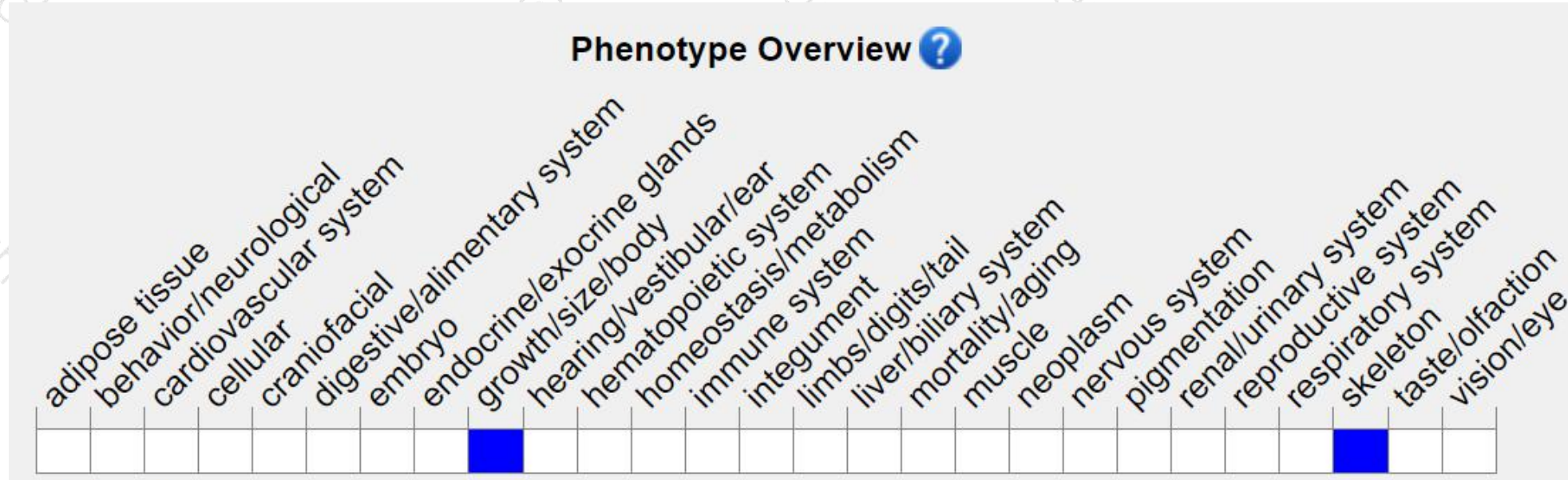
Genomic location distribution



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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