Foxn4 Cas9-KO Strategy

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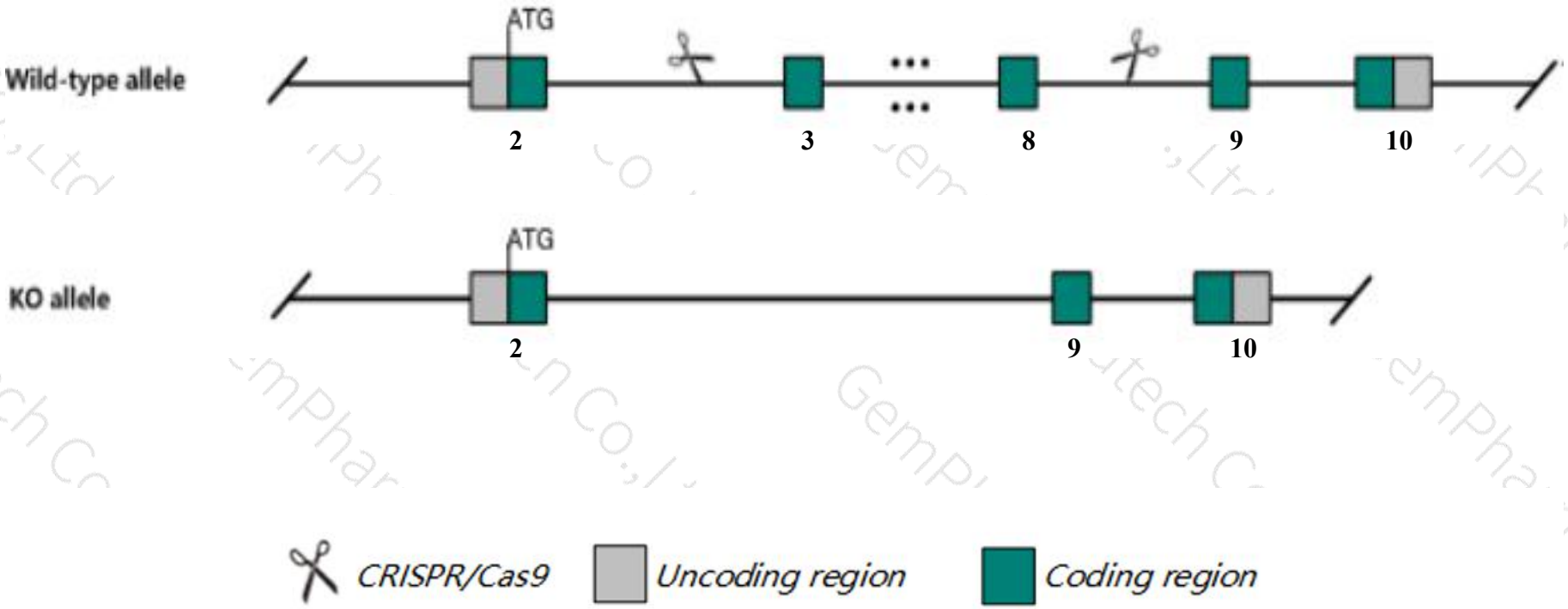
Project Overview

Project Name	***Foxn4***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Foxn4* gene. The schematic diagram is as follows:



Technical routes

➢ The *Foxn4* gene has 4 transcripts. According to the structure of *Foxn4* gene, exon3-exon8 of *Foxn4-201*(ENSMUST00000044790.11) transcript is recommended as the knockout region.The region contains 827bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Foxn4* gene. The brief process is as follows: CRISPR/Cas9 system 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 mice display postnatal lethality and abnormal retina morphology with a total loss of horizontal cells and decreased amacrine cell number.

➢ The *Foxn4* 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 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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Foxn4 forkhead box N4 [*Mus musculus* (house mouse)]

Gene ID: 116810, updated on 4-Jul-2020

Summary

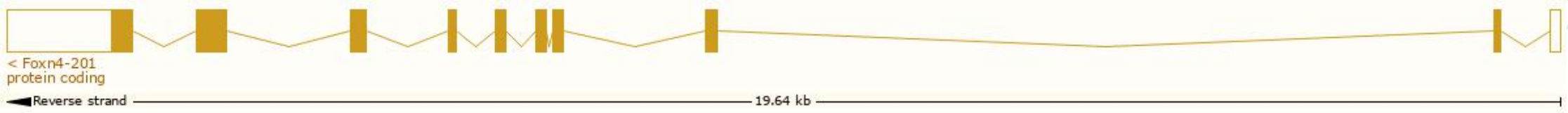
Official Symbol	Foxn4 provided by MGI
Official Full Name	forkhead box N4 provided by MGI
Primary source	MGI:MGI:2151057
See related	Ensembl:ENSMUSG00000042002
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Expression	Biased expression in CNS E11.5 (RPKM 1.7), ovary adult (RPKM 0.4) and 4 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

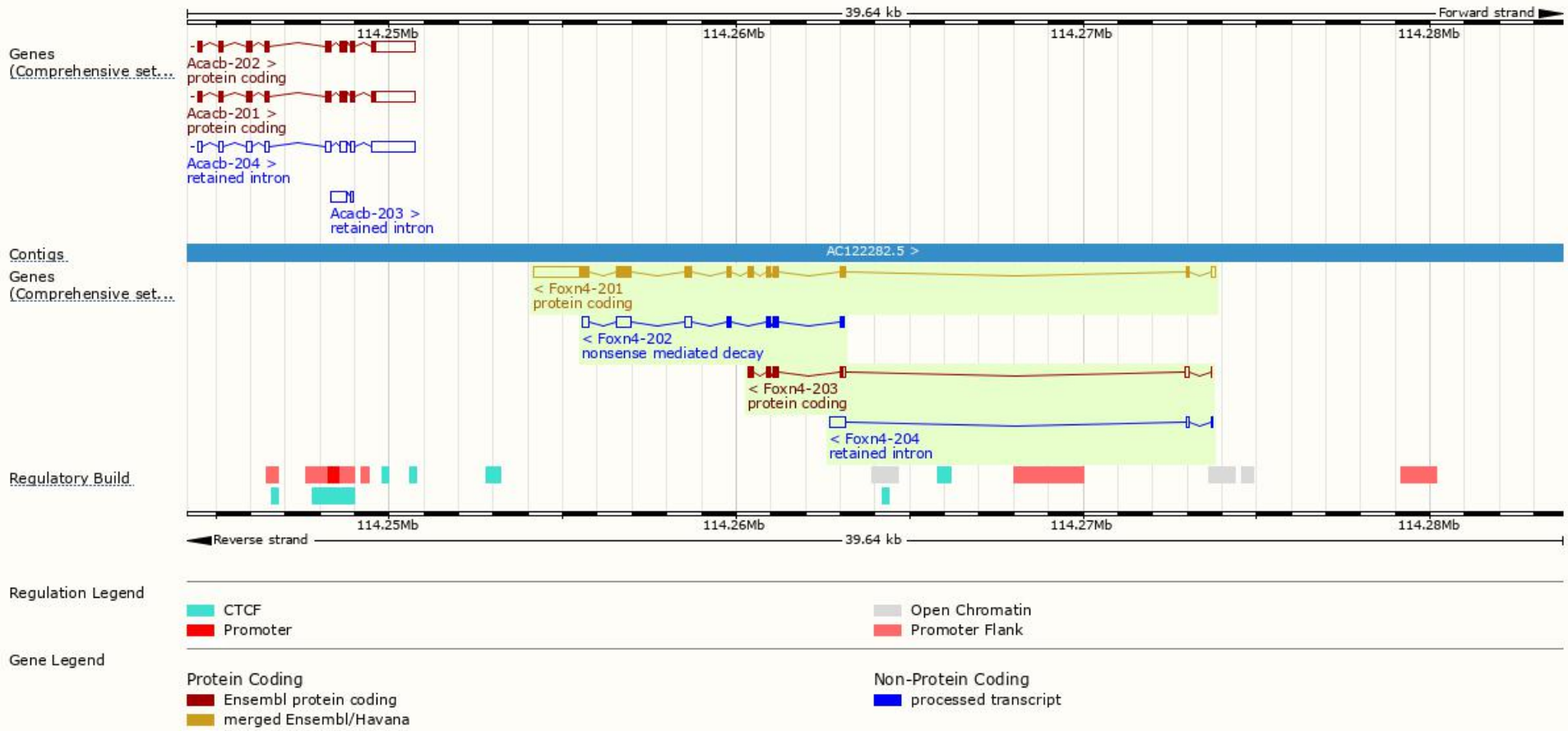
The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein ▲	Biotype	CCDS	UniProt	Flags
Foxn4-202	ENSMUST00000129530.7	1222	136aa	Nonsense mediated decay	-	F6ZBN9	CDS 5' incomplete TSL:5
Foxn4-203	ENSMUST00000144050.1	672	141aa	Protein coding	-	E9PZL8	CDS 3' incomplete TSL:5
Foxn4-201	ENSMUST00000044790.11	3016	521aa	Protein coding	CCDS19562	Q8K3Q3	TSL:1 GENCODE basic APPRIS P1
Foxn4-204	ENSMUST00000147953.1	600	No protein	Retained intron	-	-	TSL:3

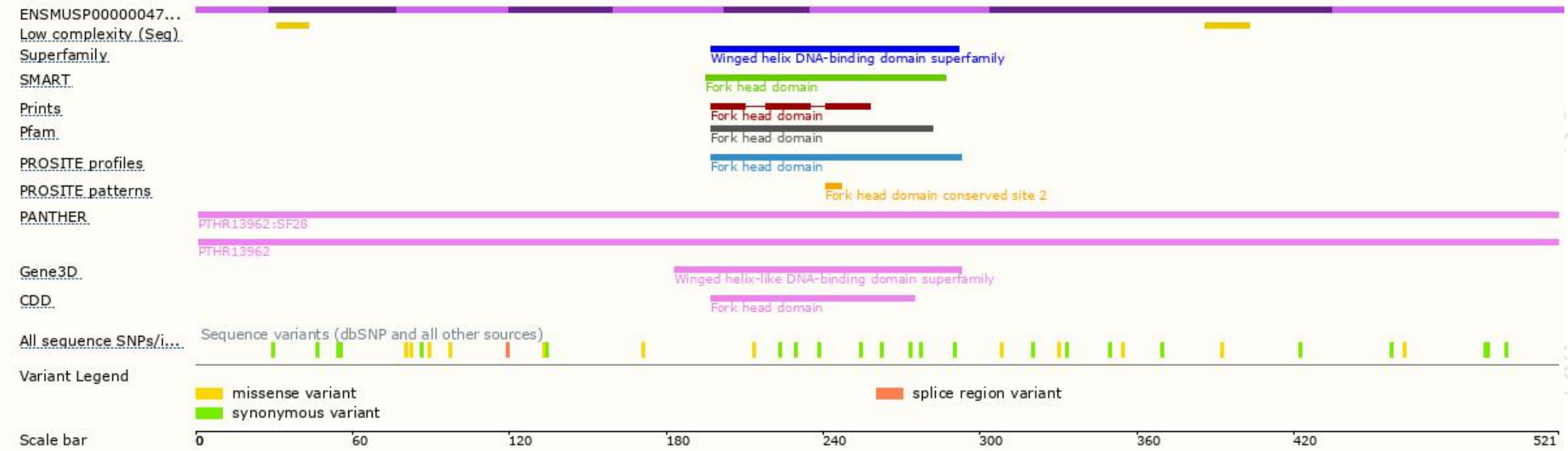
The strategy is based on the design of *Foxn4-201* transcript,the transcription is shown below:



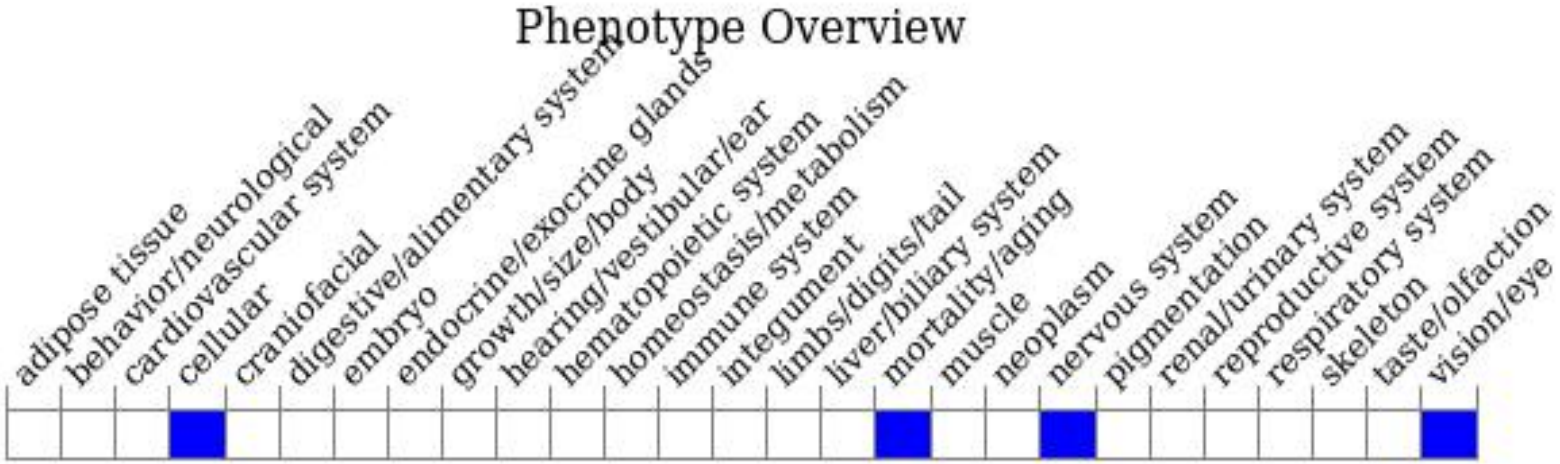
Genomic location distribution



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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