E2f4 Cas9-KO Strategy

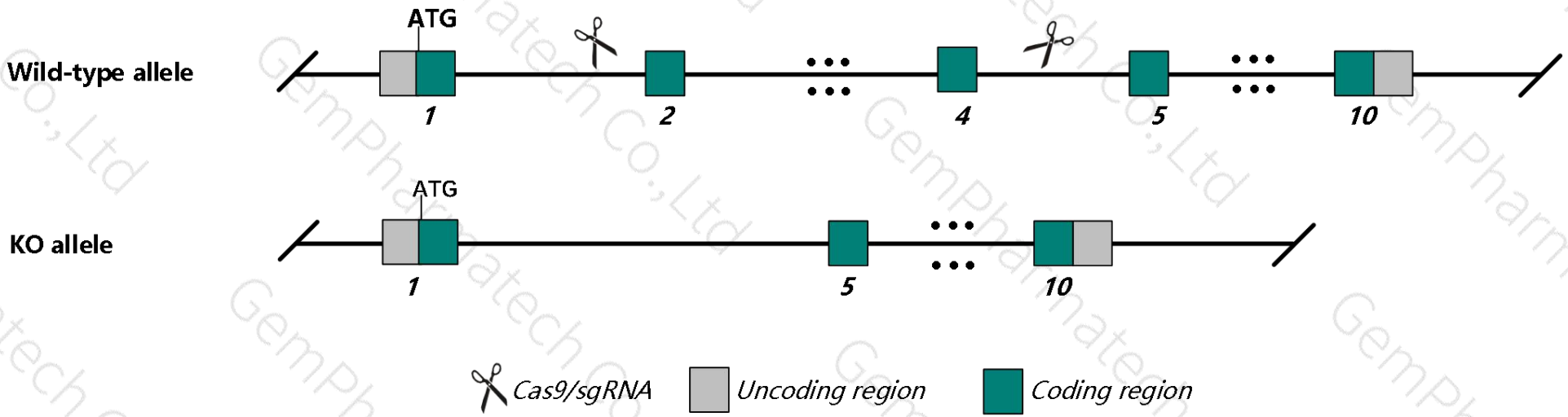
Designer: Ruirui Zhang

Project Overview

Project Name	***E2f4***
Project type	**Cas9-KO**
Strain background	**C57BL/6J**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *E2f4* gene. The schematic diagram is as follows:



Technical routes

- The *E2f4* gene has 7 transcripts. According to the structure of *E2f4* gene, exon2-4 of *E2f4-201* (ENSMUST00000015003.9) transcript is recommended as the knockout region. The region contains 316bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *E2f4* gene. The brief process is as follows: sgRNA was transcribed in vitro.Cas9 and sgRNA were microinjected into the fertilized eggs of C57BL/6J mice. Fertilized eggs were transplanted to obtain positive F0 mice which were confirmed by PCR and sequencing. The stable F1 generation mouse model was obtained by mating positive F0 generation mice with C57BL/6J mice.

Notice

- According to the existing MGI data, homozygous null mice die postnatally of an increased susceptibility to bacterial infection and exhibit craniofacial defects, erythroid abnormalities, and growth retardation.

- The *E2f4* 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.

- There are two coding genes near *E2f4* gene（ Exoc3l and Elmo3 ）, and the deletion of *E2f4* gene may affect the expression of two adjacent genes.

- 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）

集萃药康 GemPharmatech

E2f4 E2F transcription factor 4 [*Mus musculus* (house mouse)]

Gene ID: 104394, updated on 11-Jun-2019

Summary

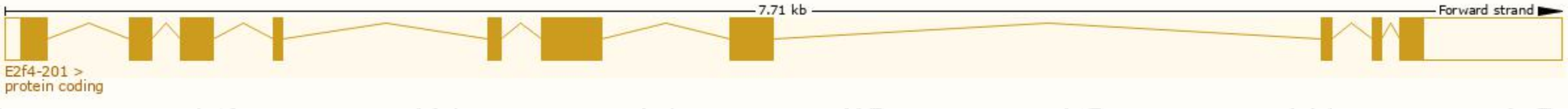
Official Symbol	E2f4 provided by MGI
Official Full Name	E2F transcription factor 4 provided by MGI
Primary source	MGI:MGI:103012
See related	Ensembl:ENSMUSG00000014859
Gene type	protein coding
RefSeq status	PROVISIONAL
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	AI427446; 2010111M04Rik
Expression	Ubiquitous expression in liver E14.5 (RPKM 188.0), liver E14 (RPKM 147.2) and 28 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

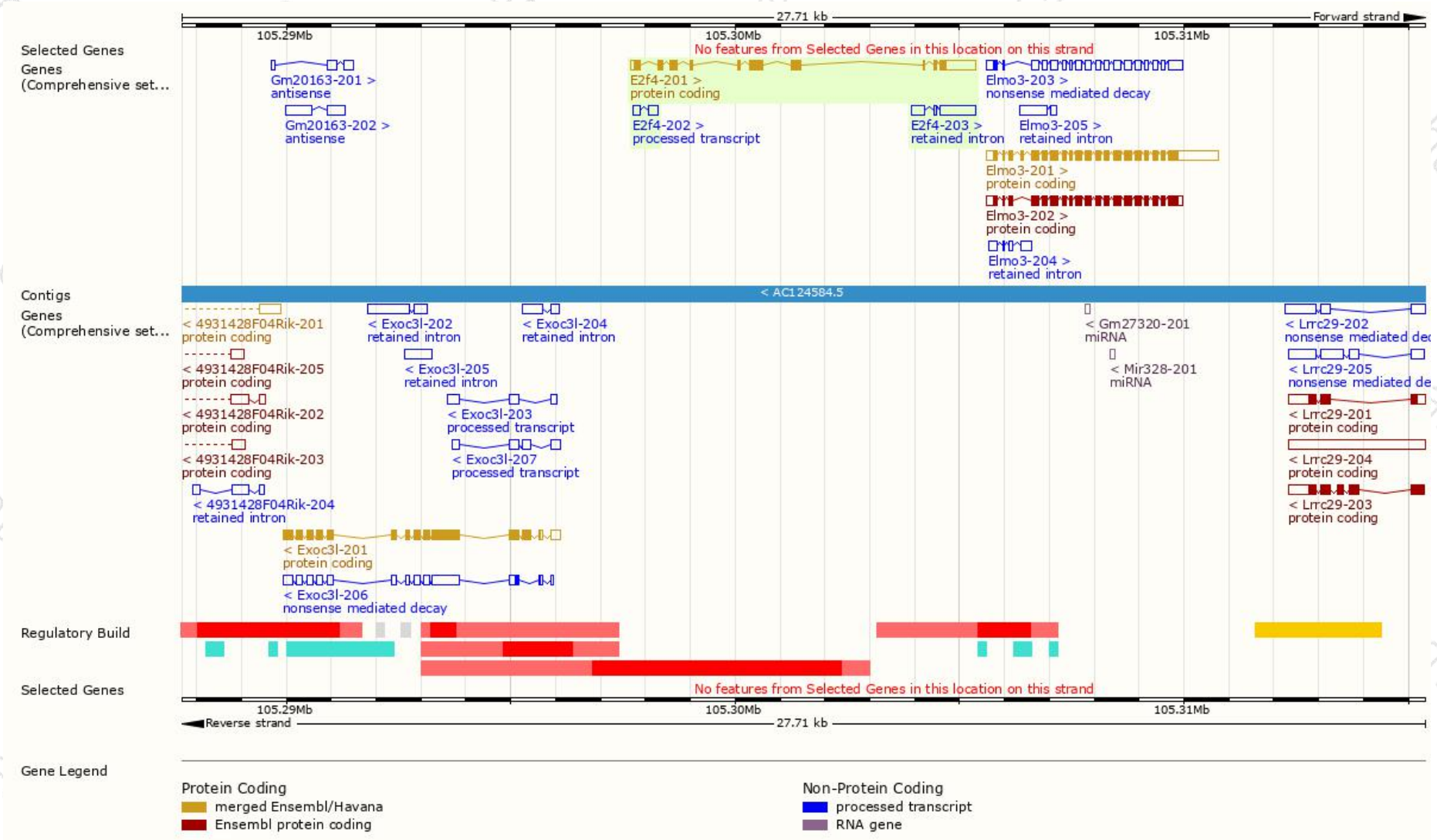
The gene has 3 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
E2f4-201	ENSMUST00000015003.9	1993	410aa	Protein coding	CCDS40456	Q8R0K9	TSL:1 GENCODE basic APPRIS P1
E2f4-202	ENSMUST00000212037.1	358	No protein	Processed transcript	-	-	TSL:3
E2f4-203	ENSMUST00000212572.1	1151	No protein	Retained intron	-	-	TSL:1

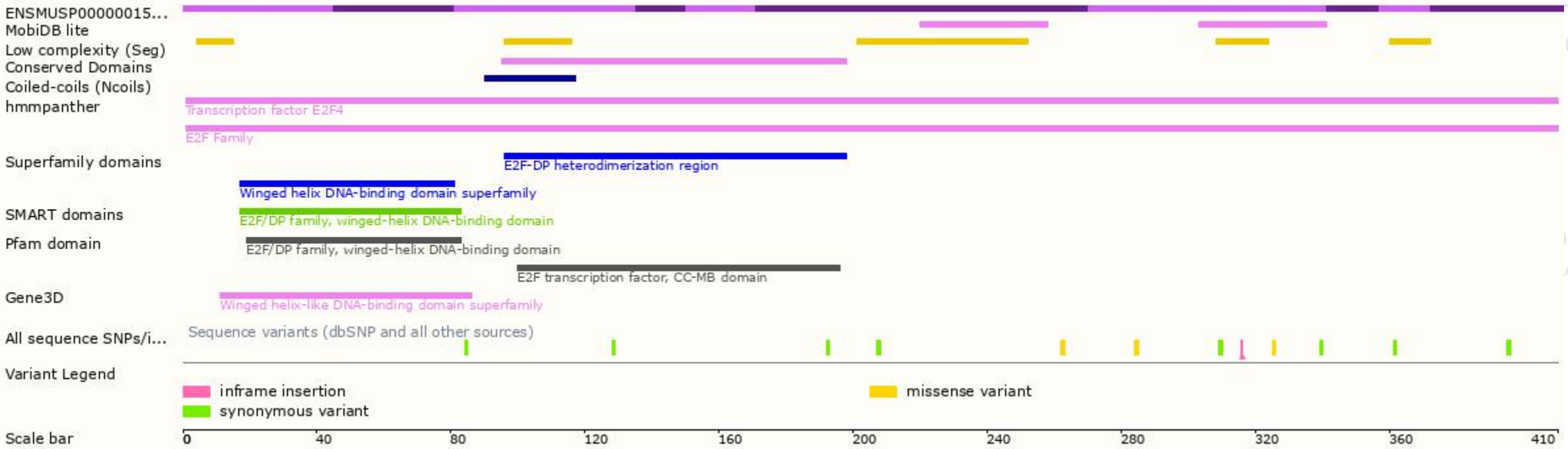
The strategy is based on the design of *E2f4-201* transcript, the transcription is shown below:



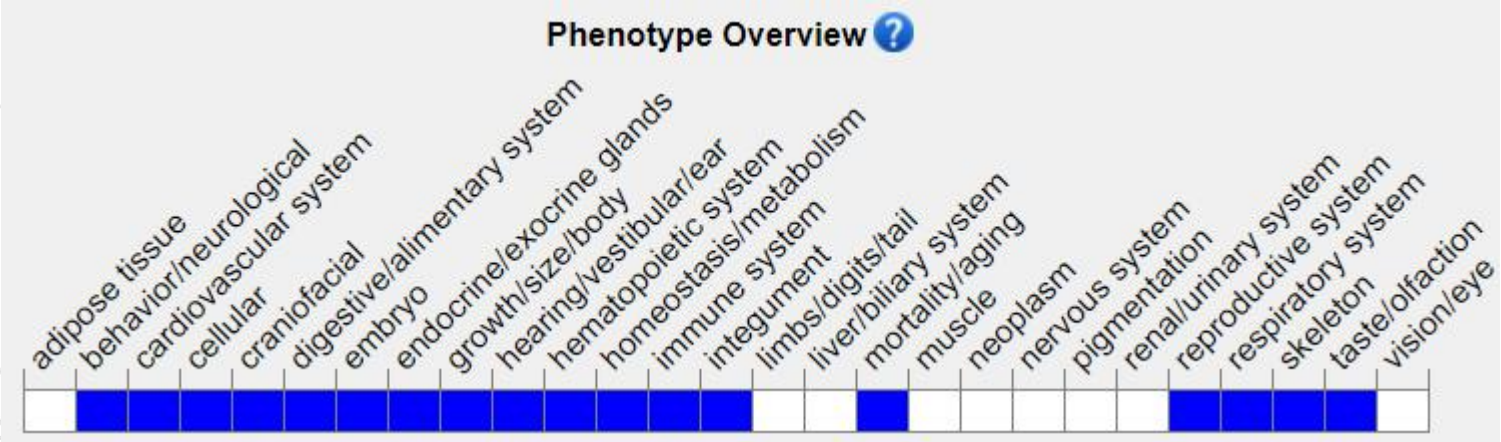
Genomic location distribution



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/).

Homozygous null mice die postnatally of an increased susceptibility to bacterial infection and exhibit craniofacial defects, erythroid abnormalities, and growth retardation.

集萃药康
GemPharmatech

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

Tel: 025-5864 1534

集萃药康生物科技
GemPharmatech Co.,Ltd