F2 Cas9-KO Strategy

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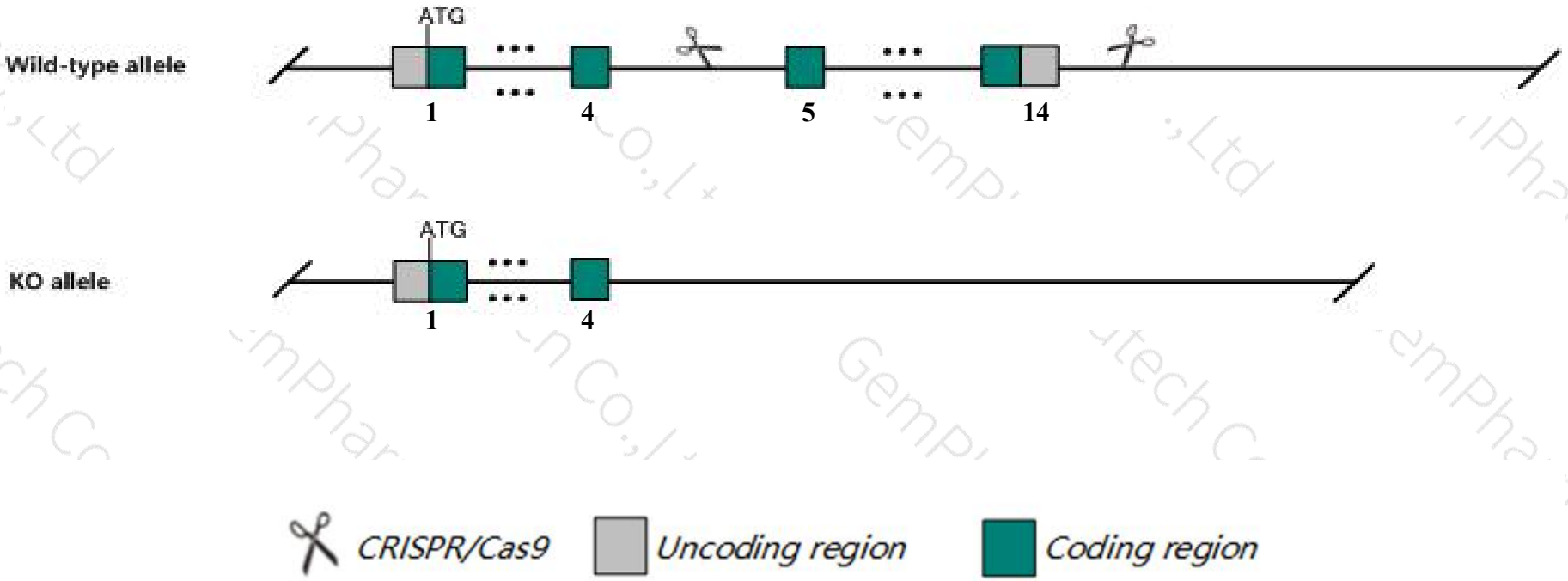
Design Date: 2019/8/30

Project Overview

Project Name	***F2***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *F2* gene. The schematic diagram is as follows:



Technical routes

➢ The *F2* gene has 3 transcripts. According to the structure of *F2* gene, exon5-exon14 of *F2-201* (ENSMUST00000028681.14) transcript is recommended as the knockout region.The region contains 1538bp coding sequenc Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *F2* gene. The brief process is as follows: CRISPR/Cas9 system we

Notice

- According to the existing MGI data,Homozygotes for targeted null mutations exhibit defects in yolk sac vasculature, internal bleeding, tissue necrosis, and die in mid- to late-gestation, or rarely, a few days after birth.

- The *F2* gene is located on the Chr2. 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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F2 coagulation factor II [*Mus musculus* (house mouse)]

Gene ID: 14061, updated on 12-Aug-2019

Summary

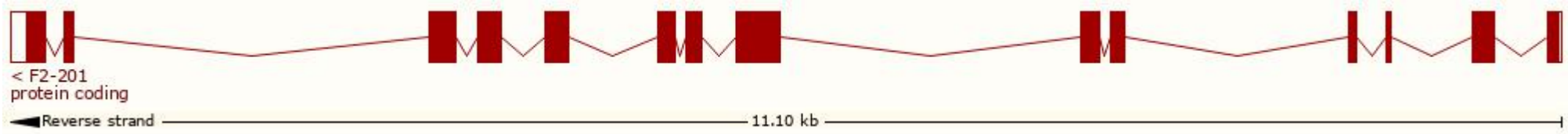
Official Symbol	F2 provided by MGI
Official Full Name	coagulation factor II provided by MGI
Primary source	MGI:MGI:88380
See related	Ensembl:ENSMUSG00000027249
Gene type	protein coding
RefSeq status	REVIEWED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Cf2; FII; Cf-2
Summary	This gene encodes a vitamin K-dependent glycoprotein coagulation factor that plays an important role in the process of blood coagulation and hemostasis. The encoded protein is an inactive zymogen that undergoes enzymatic cleavage by the coagulation factor Xa to form an active serine protease that converts soluble fibrinogen to insoluble fibrin clot. Most of the mice lacking the encoded protein die at an embryonic stage due to defects in yolk sac vasculature, while the rare neonates succumb to hemorrhage on the first postnatal day. [provided by RefSeq, Apr 2015]
Expression	Biased expression in liver adult (RPKM 695.9), liver E18 (RPKM 621.7) and 3 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

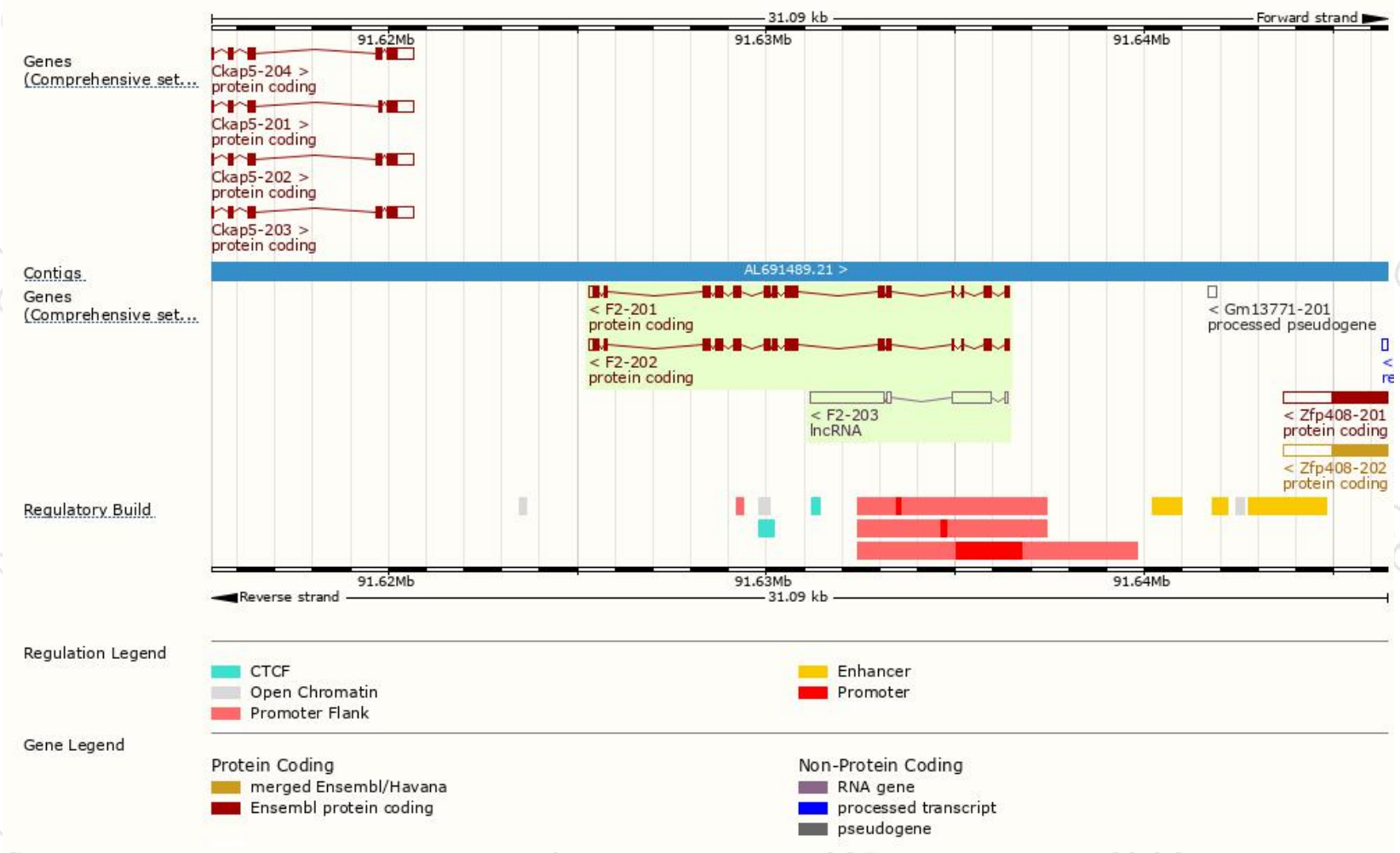
The gene has 3 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
F2-201	ENSMUST00000028681.14	1988	618aa	Protein coding	CCDS16434	P19221 Q3TJ94	TSL:1 GENCODE basic APPRIS P2
F2-202	ENSMUST00000111335.1	1969	617aa	Protein coding	-	H7BX99	TSL:5 GENCODE basic APPRIS ALT2
F2-203	ENSMUST00000153182.1	3167	No protein	lncRNA	-	-	TSL:2

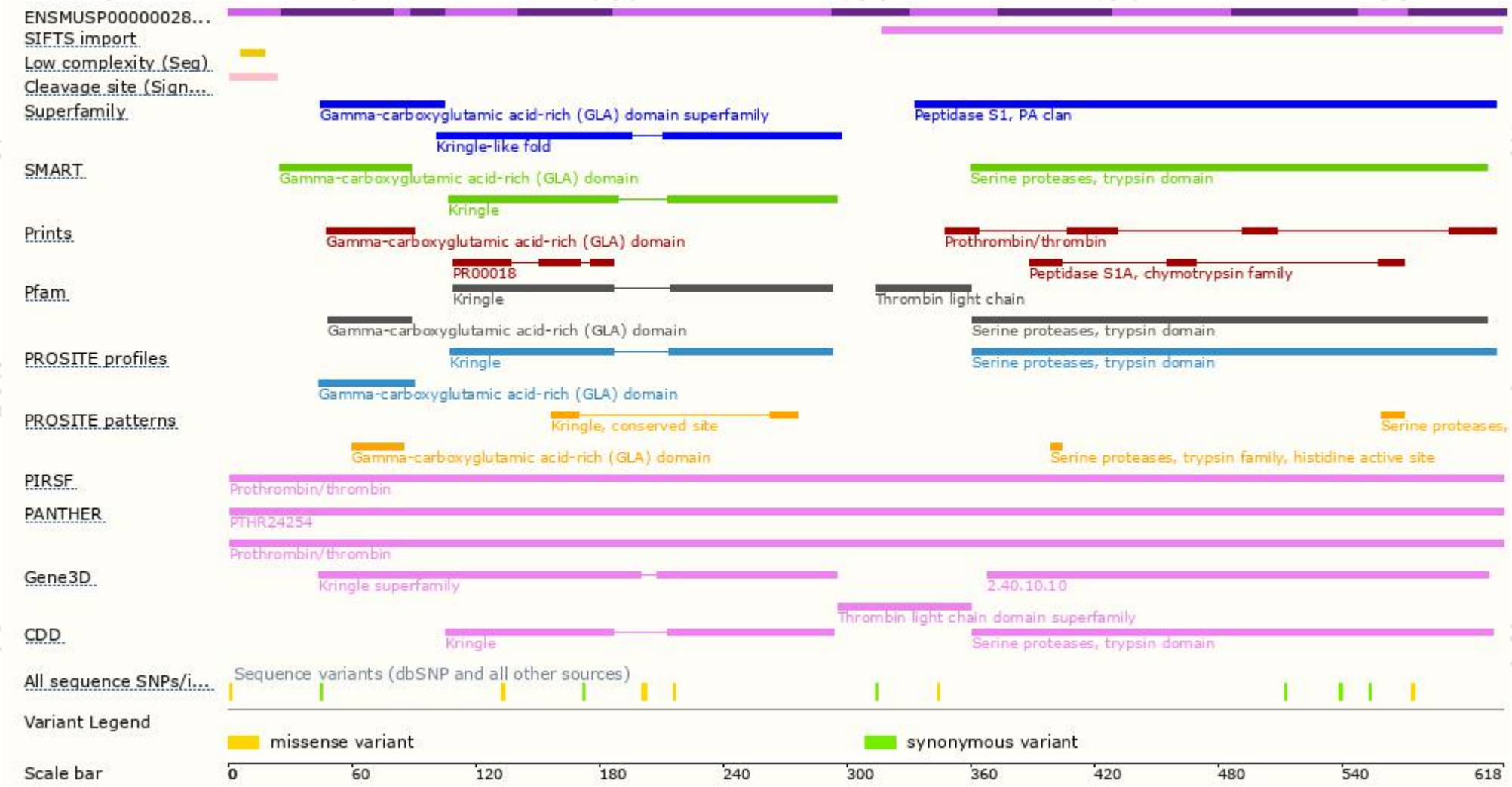
The strategy is based on the design of *F2-201* transcript,The transcription is shown below



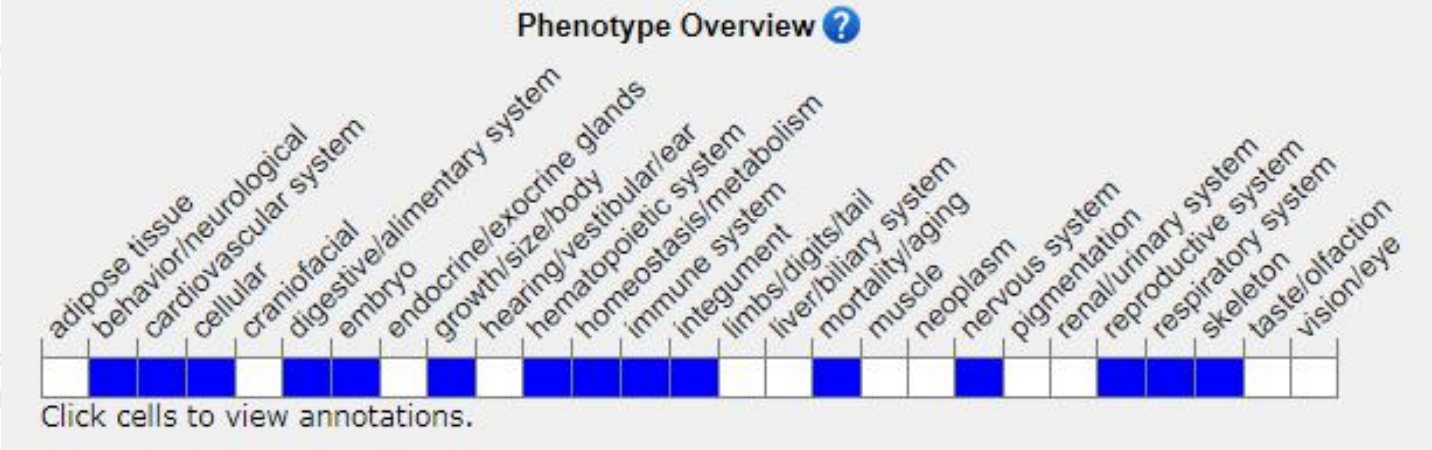
Genomic location distribution



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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