

Foxd2 Cas9-CKO Strategy

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Reviewer:

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Project Overview

Project Name

Foxd2

Project type

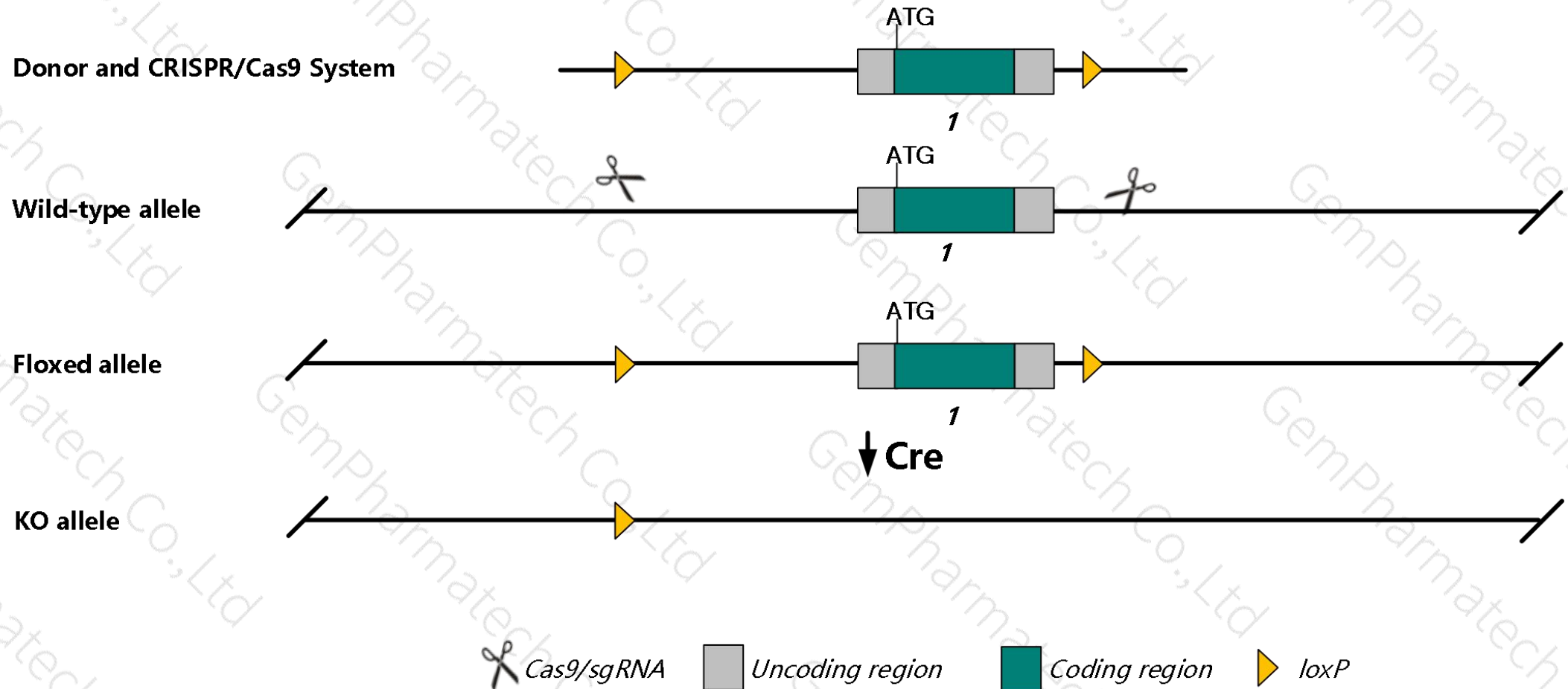
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Foxd2* gene. The schematic diagram is as follows:



Technical routes

- The *Foxd2* gene has 1 transcript. According to the structure of *Foxd2* gene, exon1 of *Foxd2-201* (ENSMUST00000068654.4) 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 *Foxd2* 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, Homozygotes for a targeted null mutation exhibit renal abnormalities including kidney hypoplasia and hydroureter. Penetrance is reduced, and dependent upon the genetic background.
- The flox region overlap with part of the *Foxd2os* gene, which may affect the regulation of this gene.
- The *Foxd2* gene is located on the Chr4. 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)

Foxd2 forkhead box D2 [*Mus musculus* (house mouse)]

Gene ID: 17301, updated on 13-Mar-2020

Summary

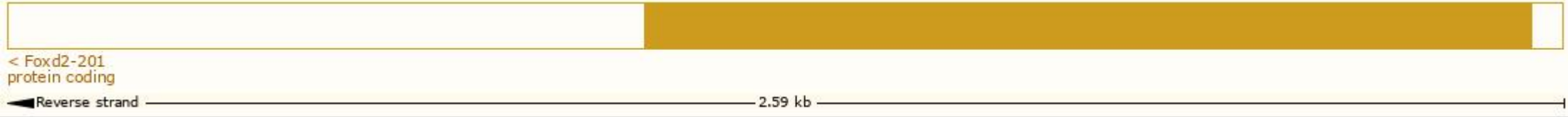
Official Symbol	Foxd2 provided by MGI
Official Full Name	forkhead box D2 provided by MGI
Primary source	MGI:MGI:1347471
See related	Ensembl:ENSMUSG00000055210
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Mf2; AI426778
Orthologs	human all

Transcript information (Ensembl)

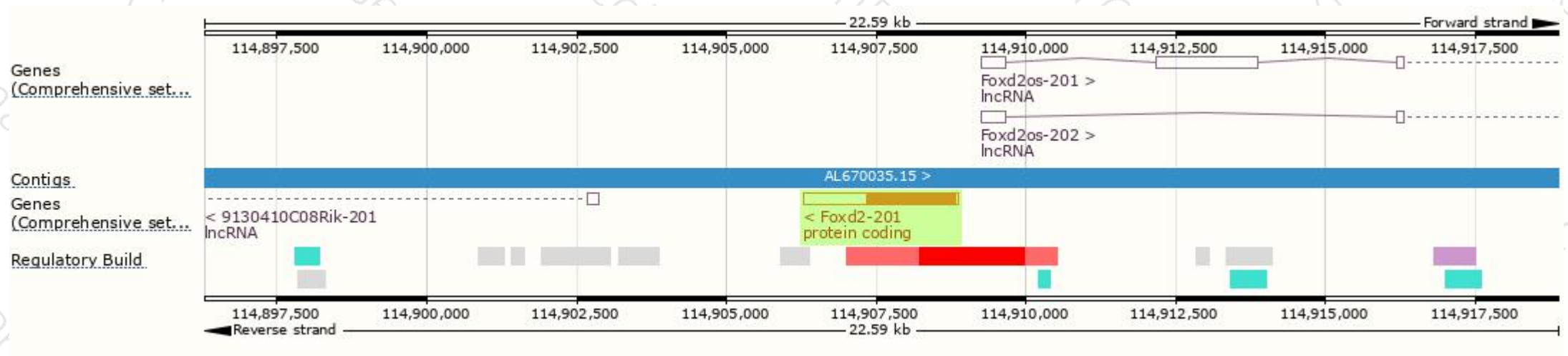
The gene has 1 transcript,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Foxd2-201	ENSMUST00000068654.4	2592	492aa	Protein coding	CCDS18482	O35392	TSL:NA GENCODE basic APPRIS P1

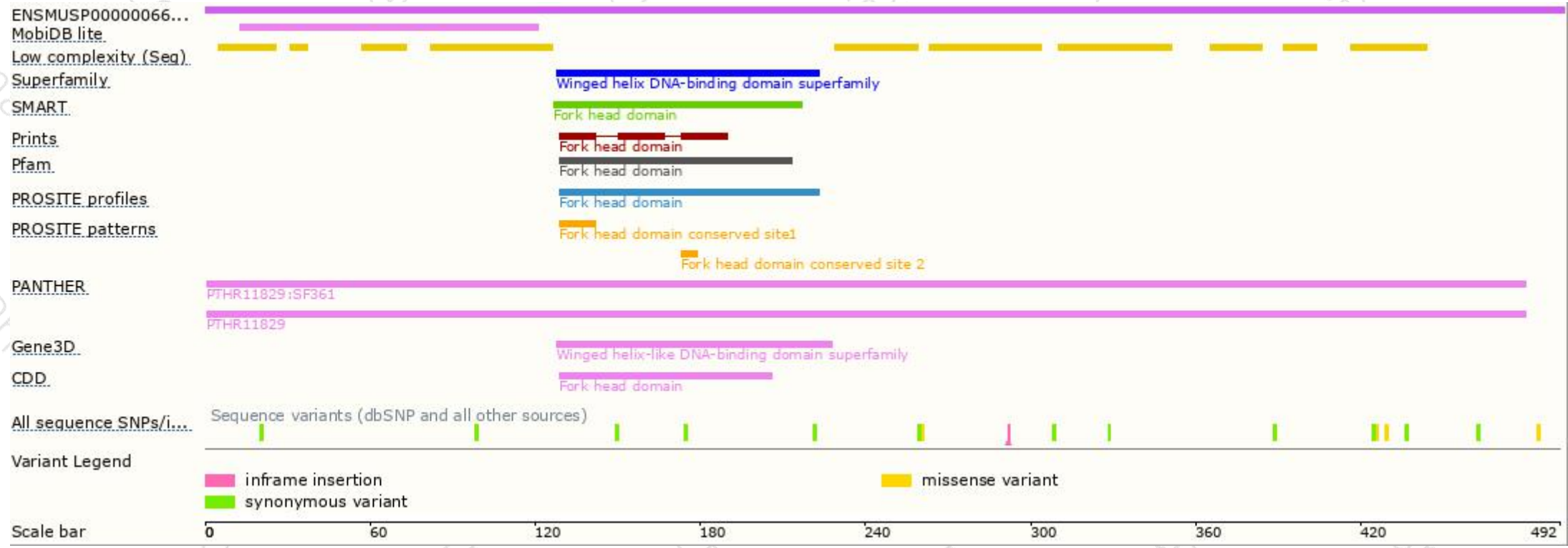
The strategy is based on the design of *Foxd2-201* transcript,The transcription is shown below



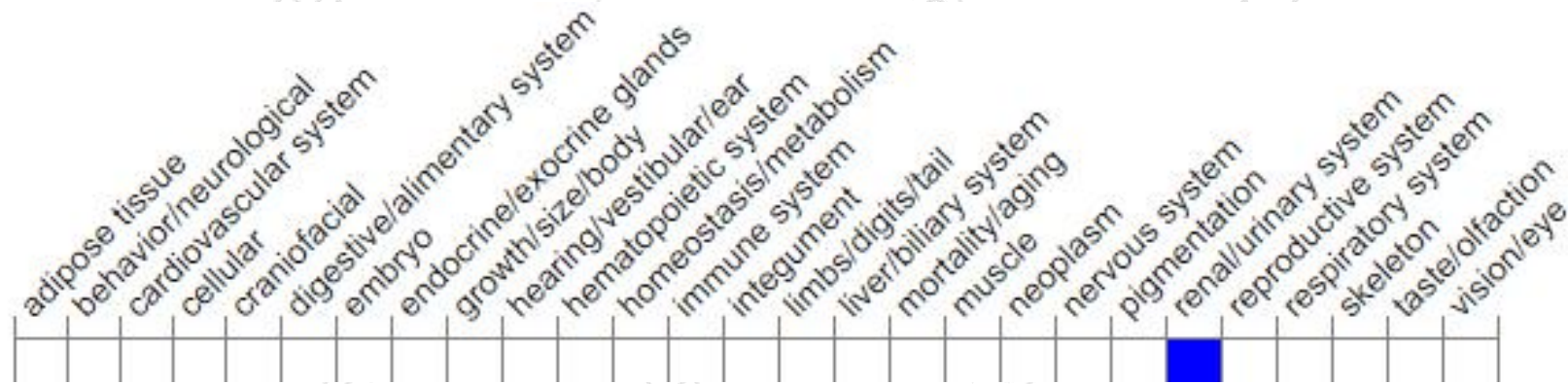
Genomic location distribution



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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