Foxa1 Cas9-KO *Strategy*

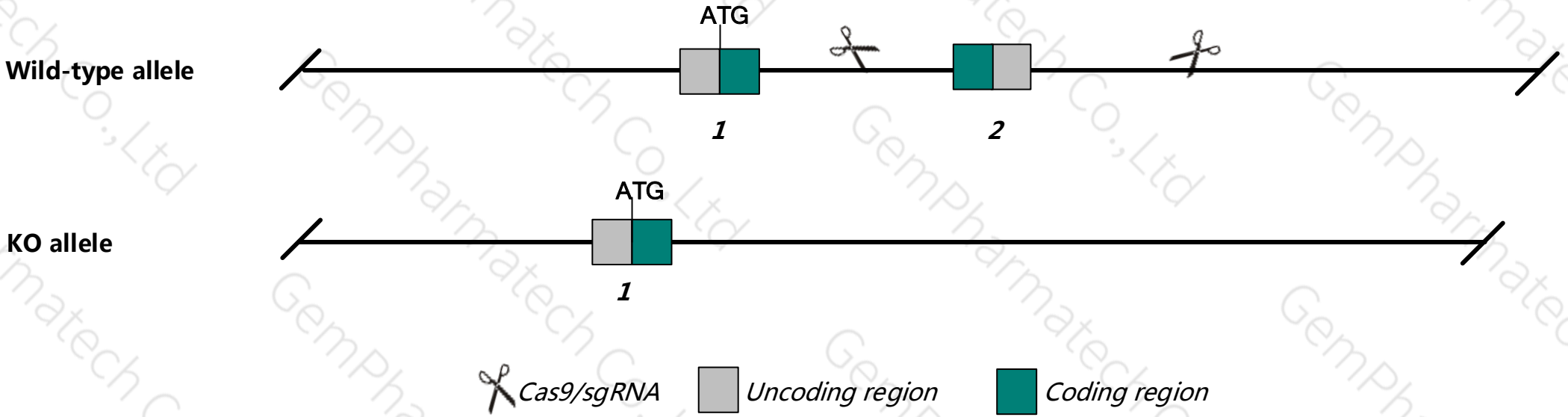
Designer: **Daohua Xu**

Project Overview

Project Name	***Foxa1***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Foxa1* gene. The schematic diagram is as follows:



Technical routes

- The *Foxa1* gene has 2 transcripts.According to the structure of *Foxa1* gene, exon2 of *Foxa1*-201 (ENSMUST00000044380.7) transcript is recommended as the knockout region.The region contains most 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 *Foxa1* gene. The brief process is as follows: sgRNA was transcribed in vitro.Cas9 and sgRNA 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，Homozygotes for targeted null mutations exhibit abnormal feeding, hypoglycemia, impaired glucagon secretion, hypotryglyceridemia, wasting, and lethality between postnatal days 2 and 14.
- The *Foxa1* gene is located on the Chr12. 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, RNA splicing and protein translation cannot be predicted at the existing technology level.

Gene information （NCBI）

集萃药康 GemPharmatech

Foxa1 forkhead box A1 [*Mus musculus* (house mouse)]

Gene ID: 15375, updated on 14-May-2019

Summary

Official Symbol	Foxa1 provided by MGI
Official Full Name	forkhead box A1 provided by MGI
Primary source	MGI:MGI:1347472
See related	Ensembl:ENSMUSG00000035451
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	Hnf3a; Tcf3a; Hnf-3a; Tcf-3a
Expression	Biased expression in stomach adult (RPKM 30.0), colon adult (RPKM 27.6) and 9 other tissues See more
Orthologs	human all

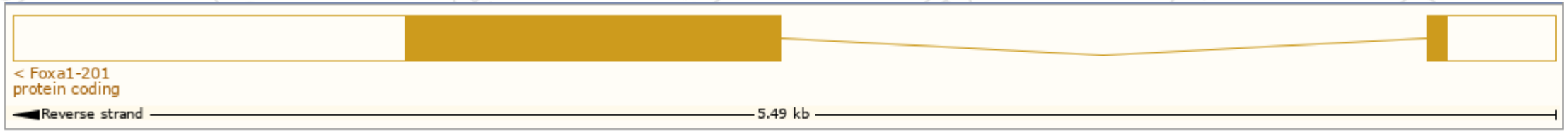
Transcript information（Ensembl）

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

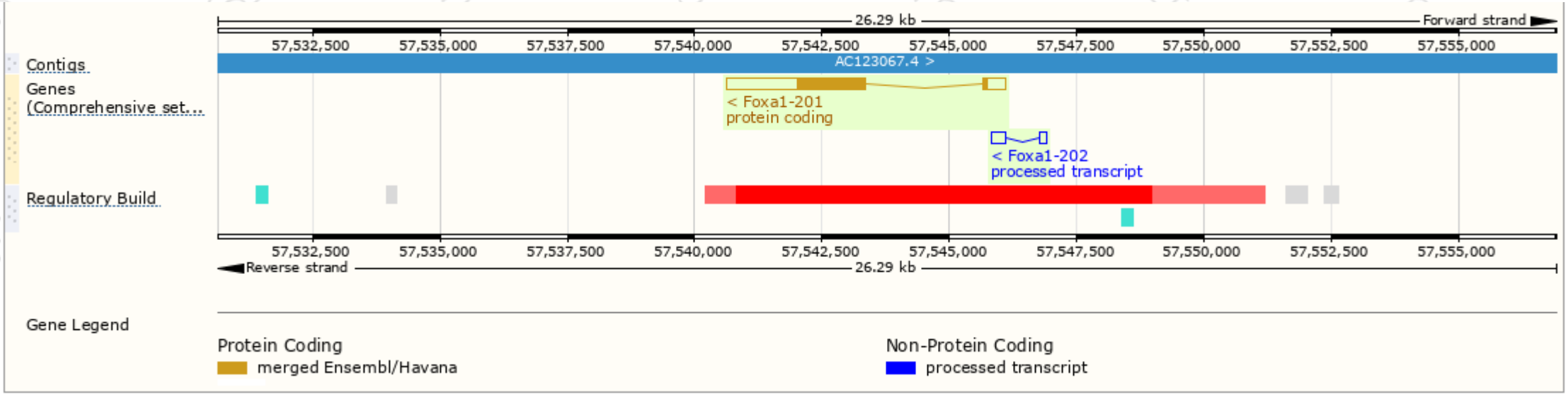
Show/hide columns (1 hidden) Filter

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Foxa1-201	ENSMUST00000044380.7	3191	468aa	Protein coding	CCDS25926	P35582	TSL:1 GENCODE basic APPRIS P1
Foxa1-202	ENSMUST00000218398.1	414	No protein	Processed transcript	-	-	TSL:2

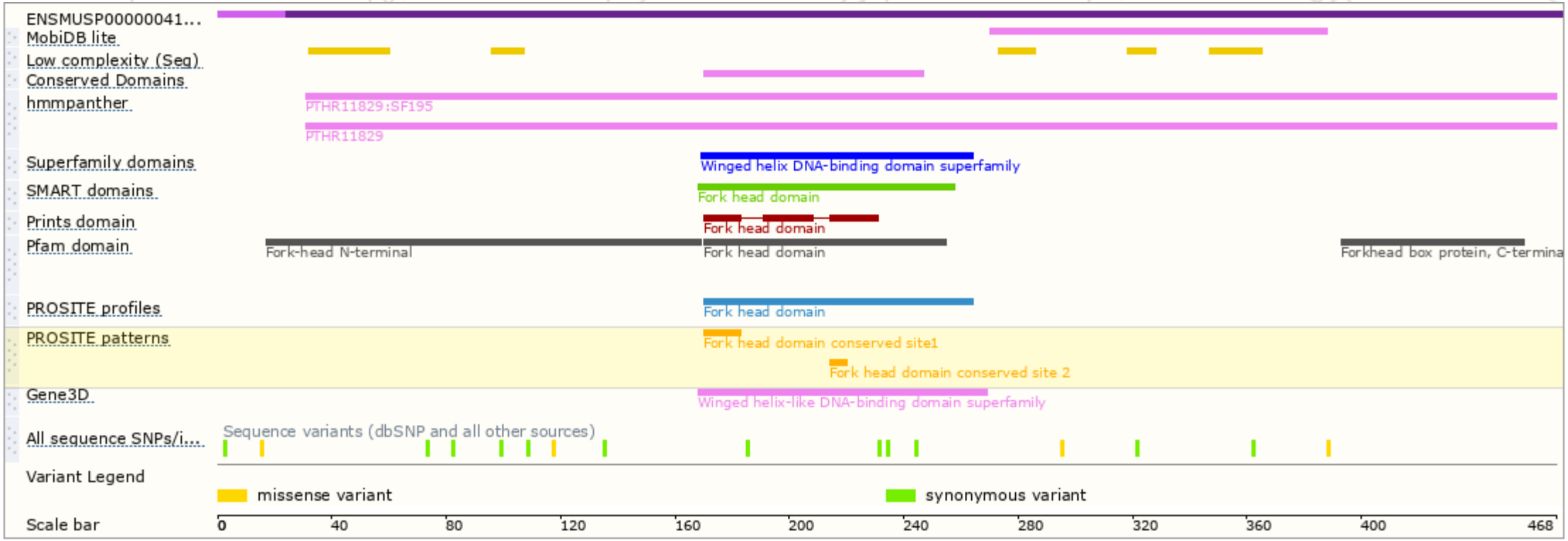
The strategy is based on the design of *Foxa1*-201 transcript,The transcription is shown below



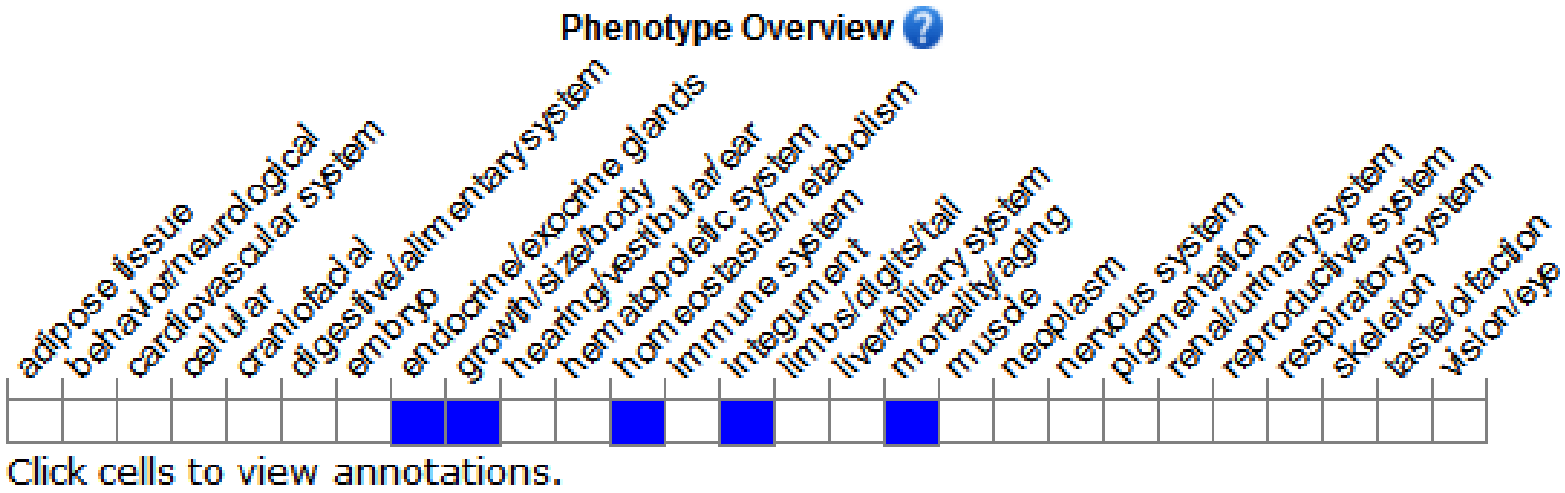
Genomic location distribution



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/) .

According to the existing MGI data,Homozygotes for targeted null mutations exhibit abnormal feeding, hypoglycemia, impaired glucagon secretion, hypotryglyceridemia, wasting, and lethality between postnatal days 2 and 14.

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

Tel: 025-5864 1534

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GemPharmatech Co.,Ltd