Zic2 Cas9-KO *Strategy*

Designer: **Huan Fan**

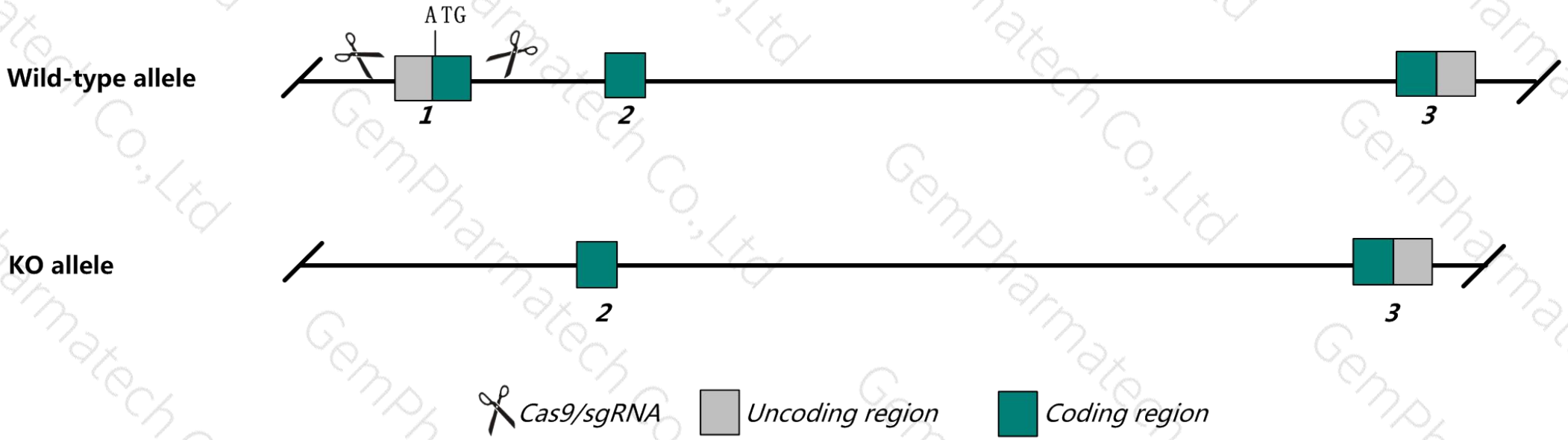
Design Date: **2019-8-4**

Project Overview

Project Name	***Zic2***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Zic2* gene. The schematic diagram is as follows:



Technical routes

- The *Zic2* gene has 2 transcripts.According to the structure of *Zic2* gene, exon1 of *Zic2*-201(ENSMUST00000075888.5) transcript is recommended as the knockout region.The region contains start codon ATG of coding sequence.Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Zic2* gene. The brief process is as follows: gRNA was transcribed in vitro.Cas9 and gRNA 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，Defects in neurulation and forebrain development have been identified in both targeted and ENU induced homozygous mutants. Death occurs perinatally in the targeted mouse and during midgestation in the ENU mouse. Mice homozygous for a knock-down allele exhibit cognitive and social behavior defects.
- The KO region contains functional region of the *2610035F20Rik* gene.Knockout the region may affect the function of *2610035F20Rik* gene.
- The *Zic2* gene is located on the Chr14. 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）

集萃药康 GemPharmatech

Zic2 zinc finger protein of the cerebellum 2 [*Mus musculus* (house mouse)]

Gene ID: 22772, updated on 23-Apr-2019

Summary

Official Symbol	Zic2 provided by MGI
Official Full Name	zinc finger protein of the cerebellum 2 provided by MGI
Primary source	MGI:MGI:106679
See related	Ensembl:ENSMUSG00000061524
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	Ku; HPE5
Expression	Biased expression in cerebellum adult (RPKM 37.4), whole brain E14.5 (RPKM 15.2) and 5 other tissues See more
Orthologs	human all

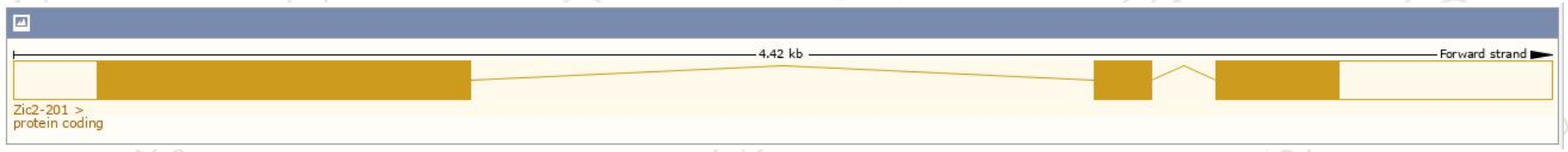
Transcript information（Ensembl）

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

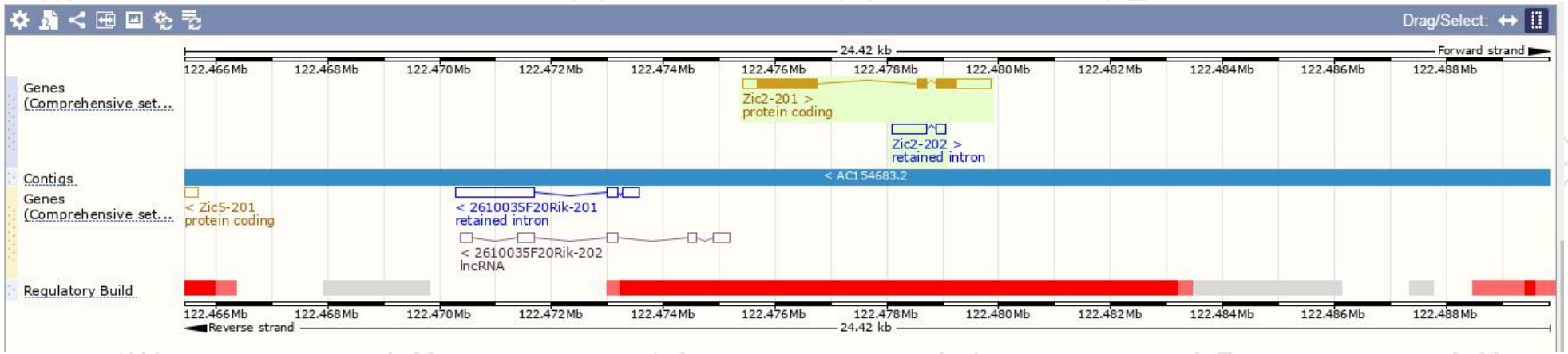
Show/hide columns (1 hidden) Filter

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Zic2-201	ENSMUST00000075888.5	2440	529aa	Protein coding	CCDS27349	F8VPV3	TSL:1 GENCODE basic APPRIS P1
Zic2-202	ENSMUST00000137059.1	765	No protein	Retained intron	-	-	TSL:2

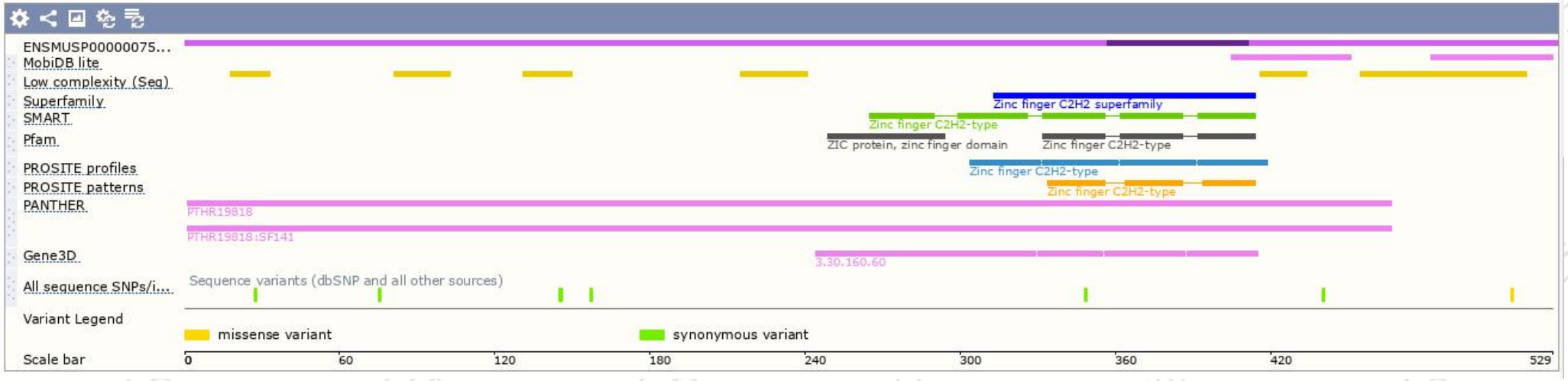
The strategy is based on the design of *Zic2*-201 transcript,The transcription is shown below



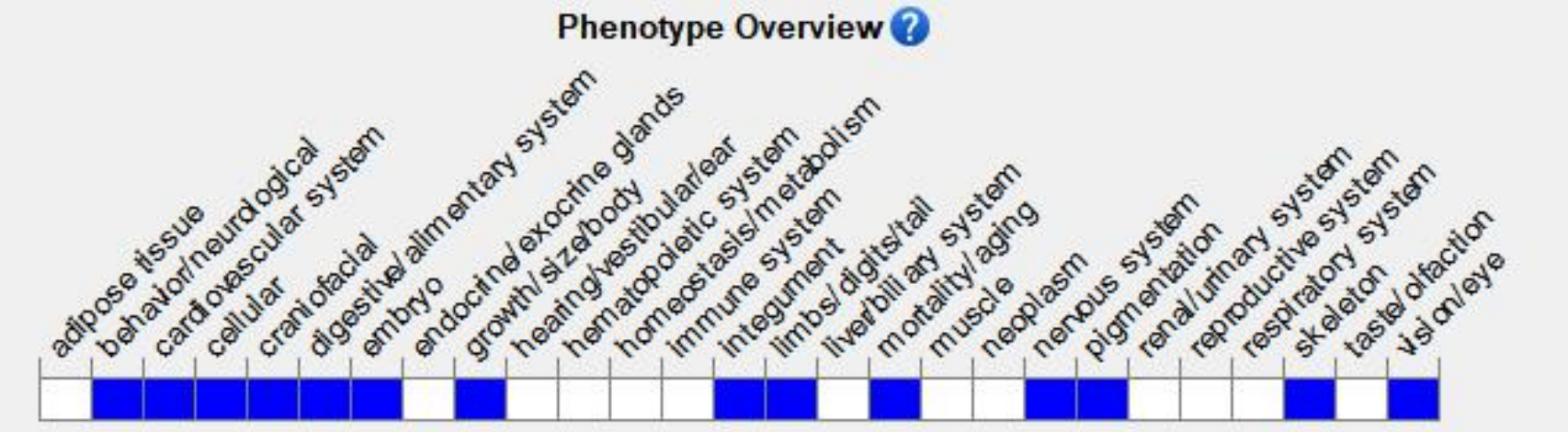
Genomic location distribution



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,Mutations in this locus affect cell-cycle regulation and apoptos is. Null homozygotes show high, early-onset tumor incidence; some have persistent hyaloid vasculature and cataracts. Truncated or temperature-sensitive alleles cause early aging phenotypes.

If you have any questions, you are welcome to inquire.
Tel: 400-9660890

集萃药康生物科技
GemPharmatech Co.,Ltd