

Fgf14 Cas9-CKO Strategy

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Reviewer:

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Design Date:

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Project Overview

Project Name

Fgf14

Project type

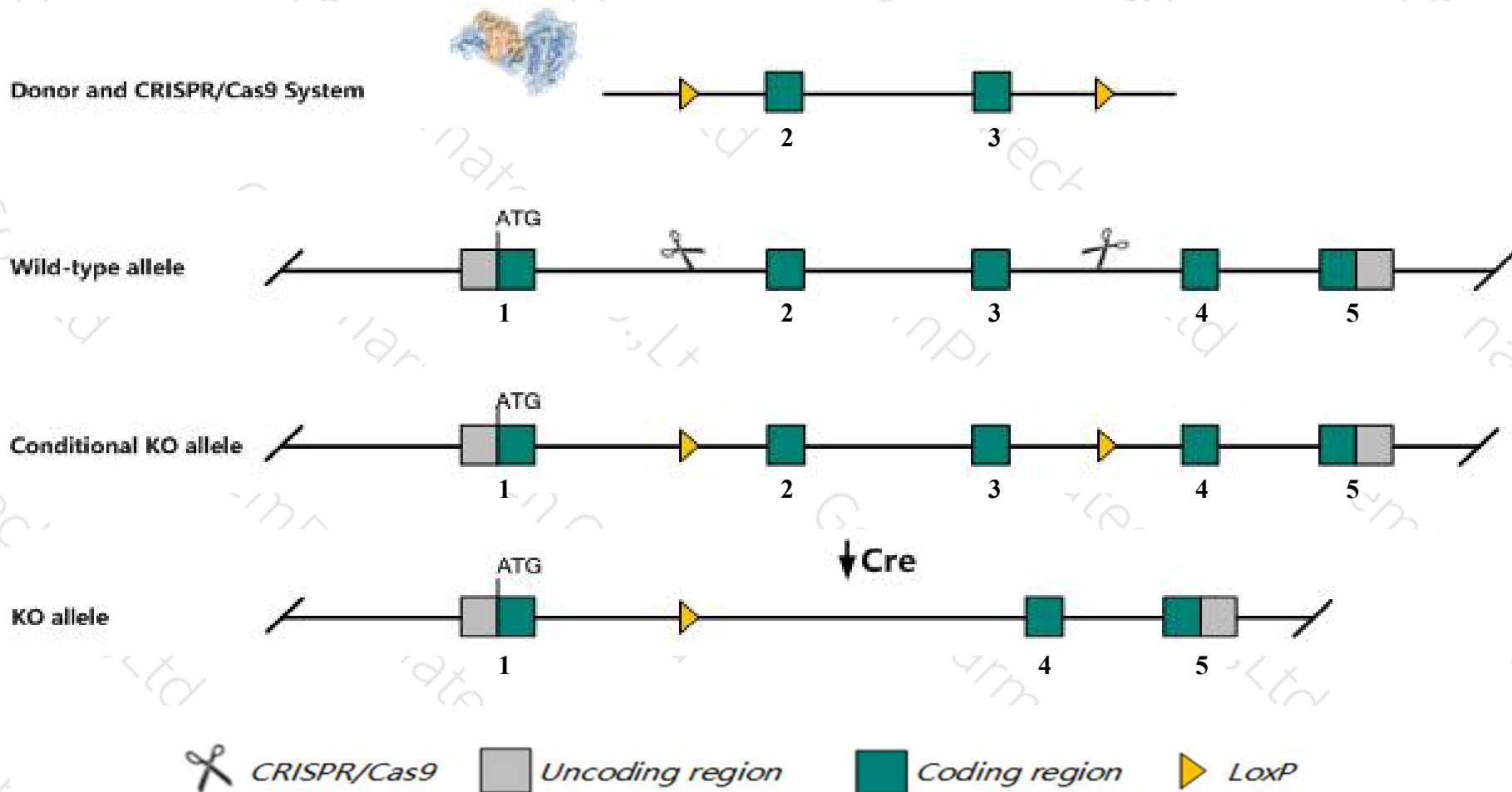
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Fgfl4* gene. The schematic diagram is as follows:



Technical routes

- The *Fgf14* gene has 2 transcripts. According to the structure of *Fgf14* gene, exon2-exon3 of *Fgf14-202* (ENSMUST00000095529.9) transcript is recommended as the knockout region. The region contains 215bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Fgf14* 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, Mice homozygous for disruptions in this gene display impaired balance and grip strength.
- The *Fgf14* 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at existing technological level.

Gene information (NCBI)

Fgf14 fibroblast growth factor 14 [*Mus musculus* (house mouse)]

Gene ID: 14169, updated on 10-Dec-2019

Summary

Official Symbol Fgf14 provided by [MGI](#)
Official Full Name fibroblast growth factor 14 provided by [MGI](#)
Primary source [MGI:MGI:109189](#)
See related [Ensembl:ENSMUSG00000025551](#)
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 Fhf4; FHF-4; mFHF-4(1B); Tg(tetO-MAPT*P301L)4510Kha
Expression Biased expression in cerebellum adult (RPKM 4.3), cortex adult (RPKM 2.4) and 7 other tissues [See more](#)
Orthologs [human](#) [all](#)

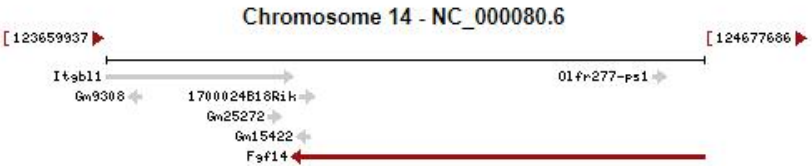
Genomic context

Location: 14 E5; 14 66.18 cM

See Fgf14 in [Genome Data Viewer](#)

Exon count: 8

Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	14	NC_000080.6 (123974441..124677686, complement)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	14	NC_000080.5 (124377513..125076349, complement)

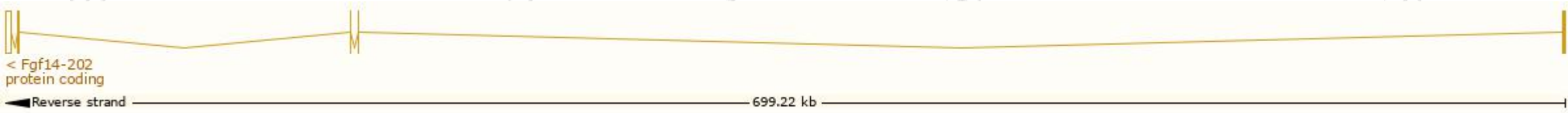


Transcript information (Ensembl)

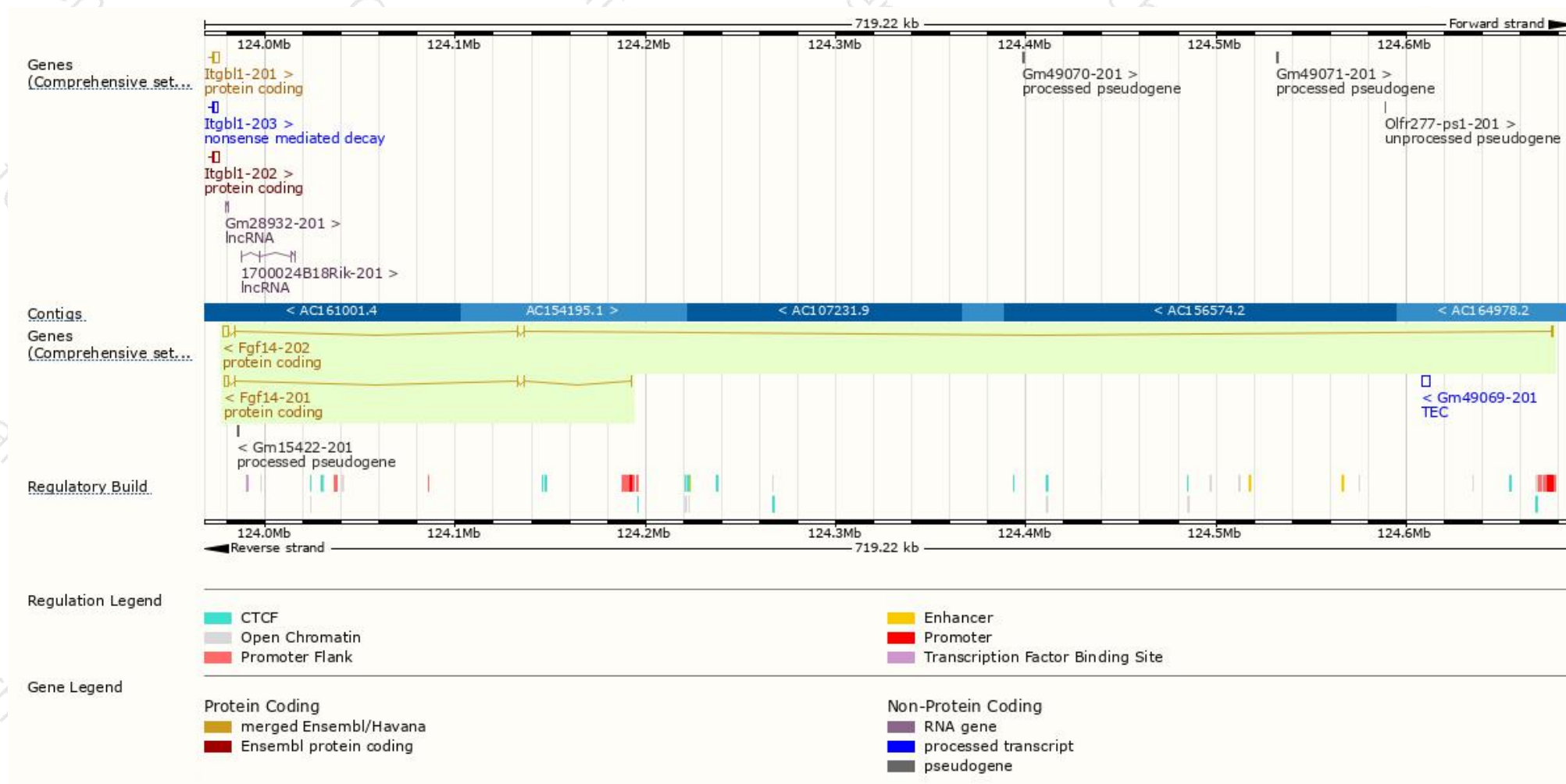
The gene has 2 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Fgf14-202	ENSMUST00000095529.9	3608	252aa	Protein coding	CCDS27355	O89096	TSL:1 GENCODE basic
Fgf14-201	ENSMUST00000026631.5	3180	247aa	Protein coding	CCDS27356	A0A0R4J063	TSL:1 GENCODE basic APPRIS P1

The strategy is based on the design of *Fgf14-202* transcript,The transcription is shown below



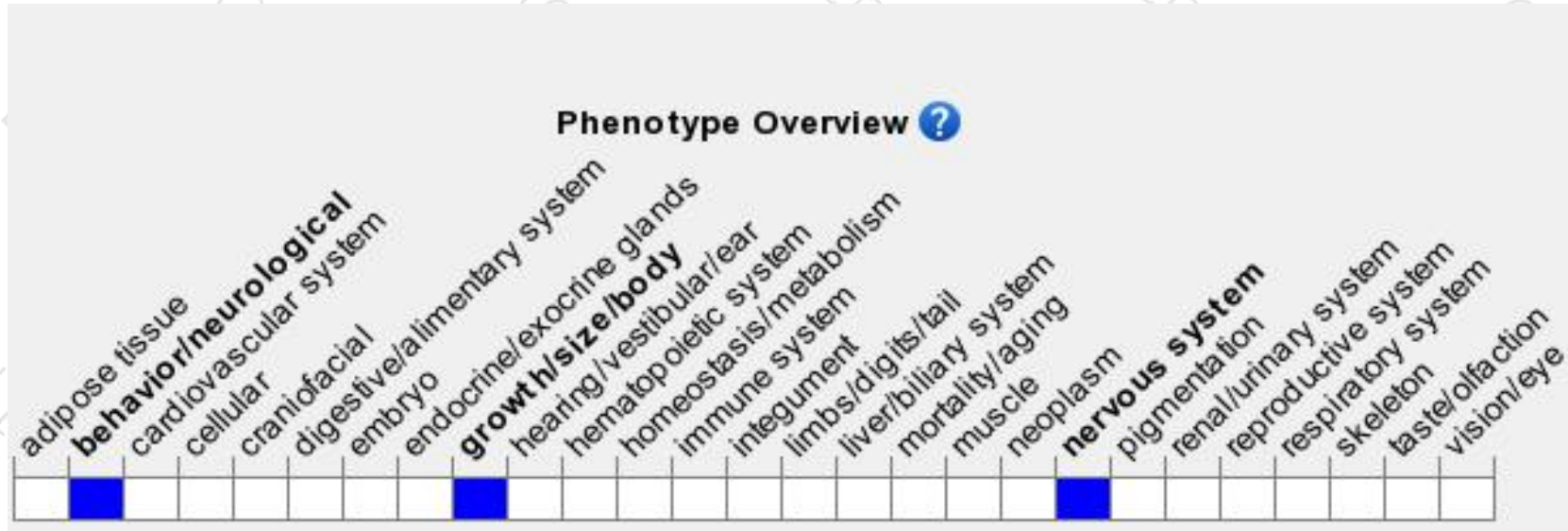
Genomic location distribution



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, Mice homozygous for disruptions in this gene display impaired balance and grip strength.

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

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