Chchd10 Cas9-CKO *Strategy*

Designer: Daohua Xu

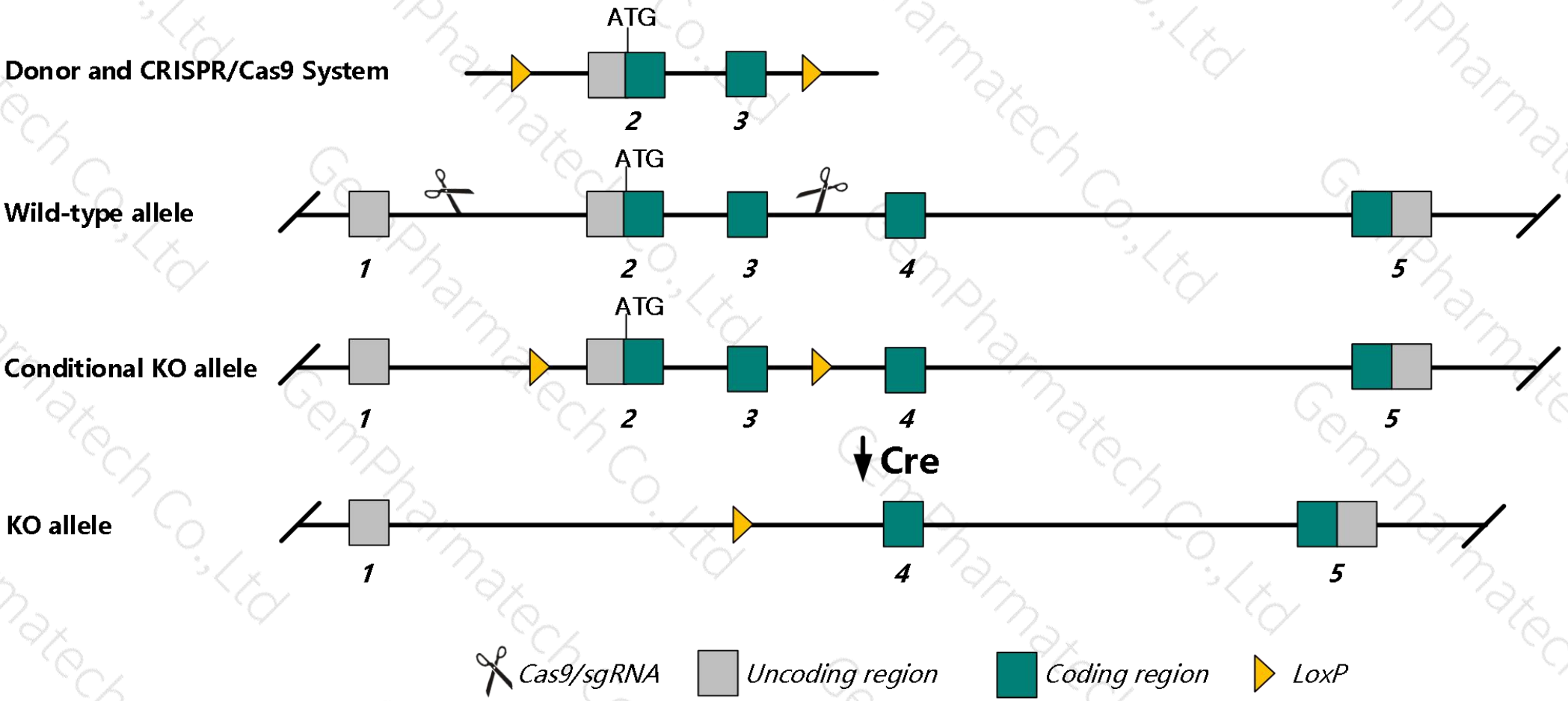
Design Date: 2019-8-5

Project Overview

Project Name	***Chchd10***
Project type	**Cas9-CKO**
Strain background	**C57BL/6J**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Chchd10* gene. The schematic diagram is as follows:



Technical routes

- The *Chchd10* gene has 3 transcripts.According to the structure of *Chchd10* gene, exon2-exon3 of *Chchd10*-203 (ENSMUST00000219839.1) transcript is recommended as the knockout region.The region contains start codon ATG.Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Chchd10* gene. The brief process is as follows: sgRNA was transcribed in vitro, donor vector was constructed.Cas9, sgRNA and Donor were microinjected into the fertilized eggs of C57BL/6J 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/6J mice.

- The flox mice was knocked out after mating with mice expressing Cre recombinase, resulting in the loss of function of the target gene in specific tissues or cell types.

Notice

- According to the existing MGI data，Homozygous deletion results in mild mitochondrial respiration anomalies in skeletal muscle.
- The KO region contains functional region of the *Mmp11* gene.Knockout the region may affect the function of *Mmp11* gene.
- The *Chchd10* gene is located on the Chr10. 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

Gene information (NCBI)

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Chchd10 coiled-coil-helix-coiled-coil-helix domain containing 10 [*Mus musculus* (house mouse)]

Gene ID: 103172, updated on 23-Oct-2018

Summary

Official Symbol	Chchd10 provided by MGI
Official Full Name	coiled-coil-helix-coiled-coil-helix domain containing 10 provided by MGI
Primary source	MGI:MGI:2143558
See related	Ensembl:ENSMUSG00000049422
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	Ndg2; AI267078; 1620401E04Rik
Expression	Biased expression in adrenal adult (RPKM 1343.9), duodenum adult (RPKM 646.7) and 10 other tissues See more
Orthologs	human all

Transcript information （Ensembl）

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

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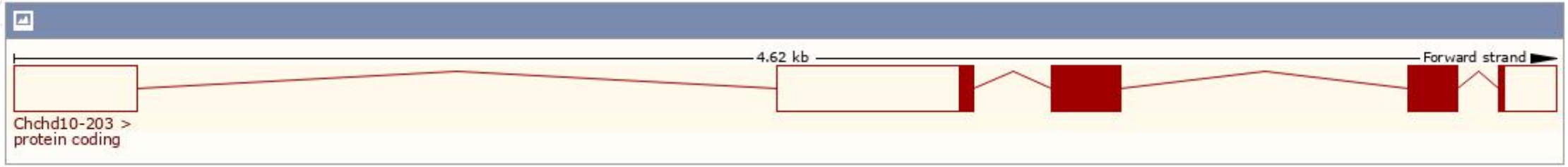
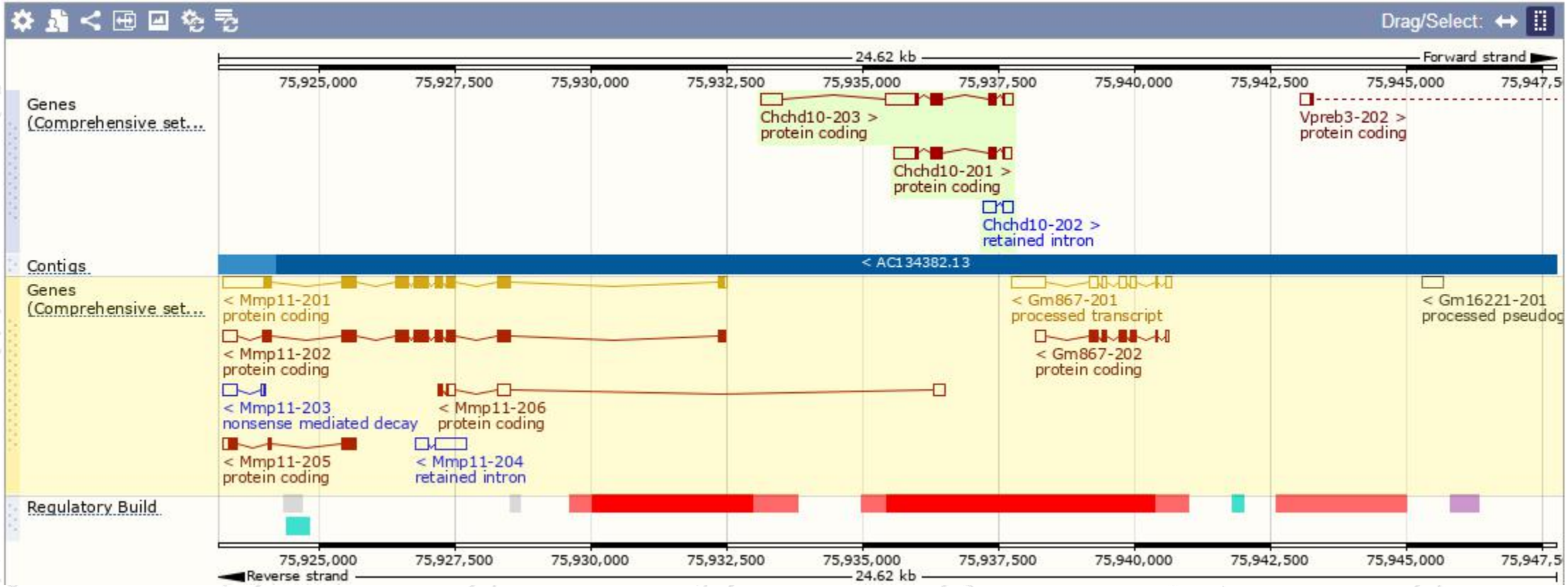
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	RefSeq	Flags
Chchd10-203	ENSMUST00000219839.1	1488	138aa	Protein coding	CCDS23938	Q7TNL9	-	TSL:1 GENCODE basic APPRIS P1
Chchd10-201	ENSMUST00000058906.6	939	138aa	Protein coding	CCDS23938	Q7TNL9	NM_175329 NP_780538	TSL:1 GENCODE basic APPRIS P1
Chchd10-202	ENSMUST00000219435.1	405	No protein	Retained intron	-	-	-	TSL:2

The strategy is based on the design of *Chchd10*-203 transcript,The transcription is shown below

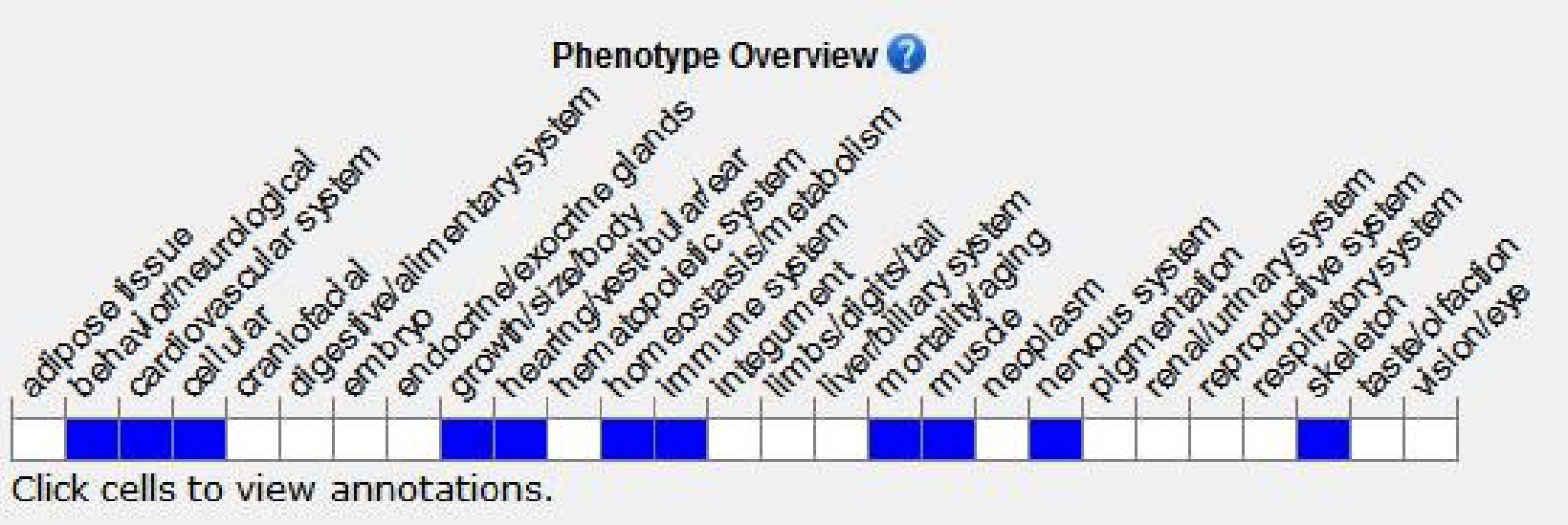


Genomic location distribution



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,Homozygous deletion results in mild mitochondrial respiration anomalies in skeletal muscle.

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

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