Sync Cas9-CKO Strategy

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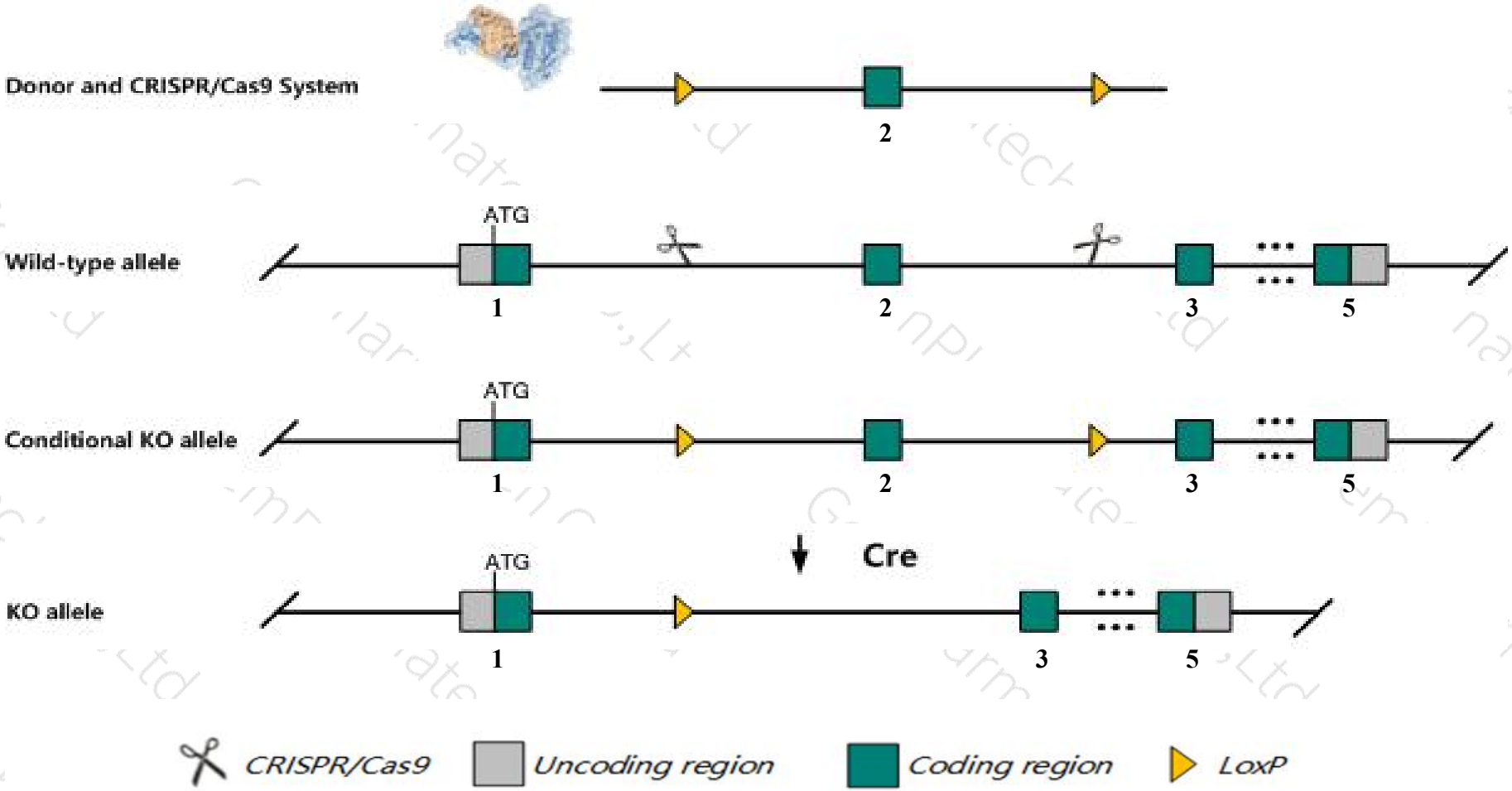
Project Overview

Project Name	***Sync***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

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



Technical routes

- The *Sync* gene has 2 transcripts. According to the structure of *Sync* gene, exon2 of *Sync-201* (ENSMUST00000102599.3) transcript is recommended as the knockout region.The region contains 1150bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Sync* 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.

Notice

- According to the existing MGI data,Homozygotes for one knock-out allele show reduced generation of isometric stress in skeletal muscle but a normal response to eccentric contraction-induced injury. Homozygotes for another knock-out allele show impaired contractility and increased skeletalmuscle damage under a forced exercise regime.

- The *Sync* 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）

集萃药康 GemPharmatech

Sync syncoilin [*Mus musculus* (house mouse)]

Gene ID: 68828, updated on 12-Aug-2019

Summary

Official Symbol	Sync provided by MGI
Official Full Name	syncoilin provided by MGI
Primary source	MGI:MGI:1916078
See related	Ensembl:ENSMUSG00000001333
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	SNIP4; 1110057H03Rik
Expression	Ubiquitous expression in heart adult (RPKM 5.1), limb E14.5 (RPKM 2.2) and 24 other tissues See more
Orthologs	human all

Genomic context

Location: 4 D2.2; 4 63.26 cM

See Sync in Genome Data Viewer

Exon count: 4

Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	4	NC_000070.6 (129287256..129309383)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	4	NC_000070.5 (128964865..128985803)

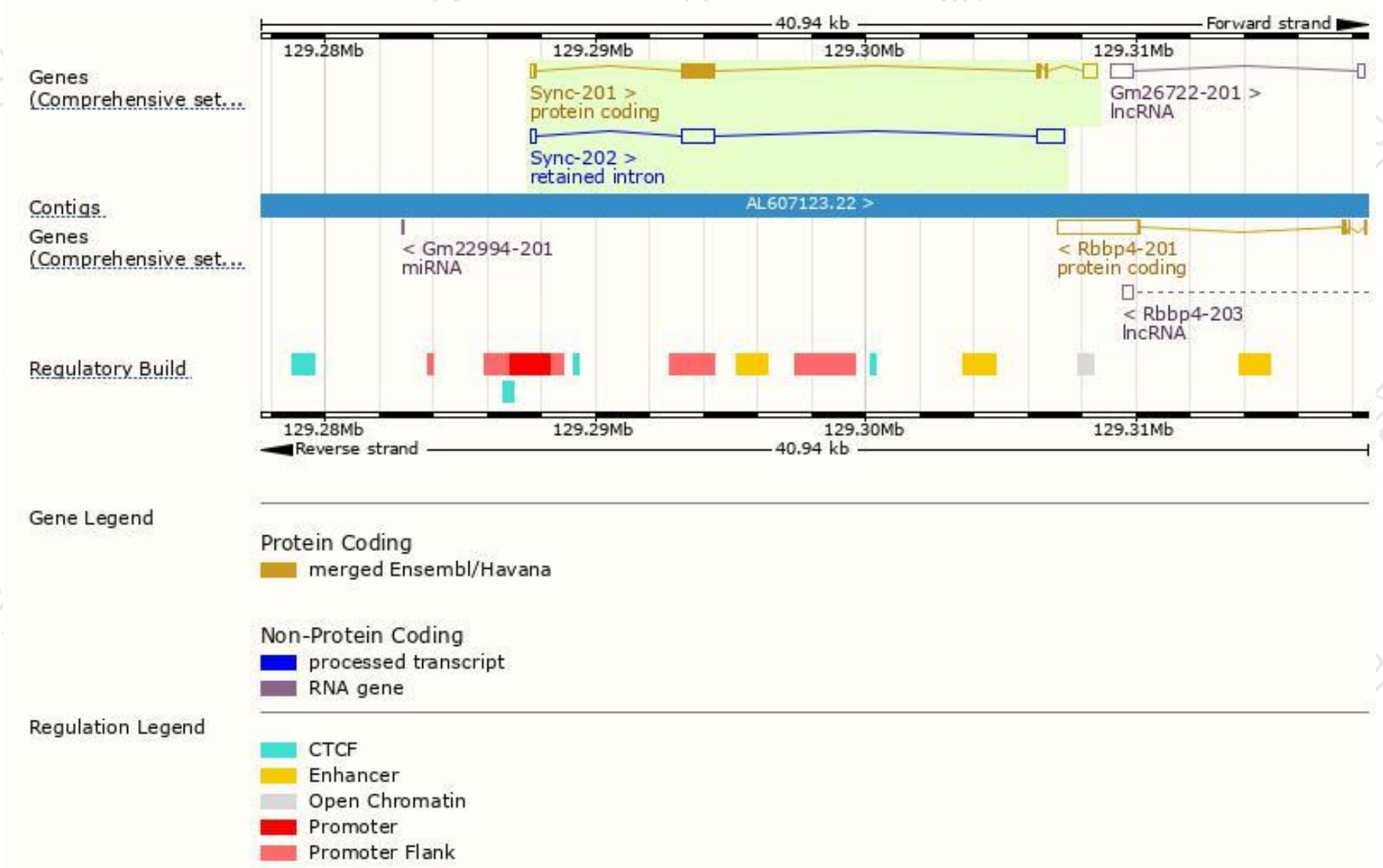
Transcript information（Ensembl）

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

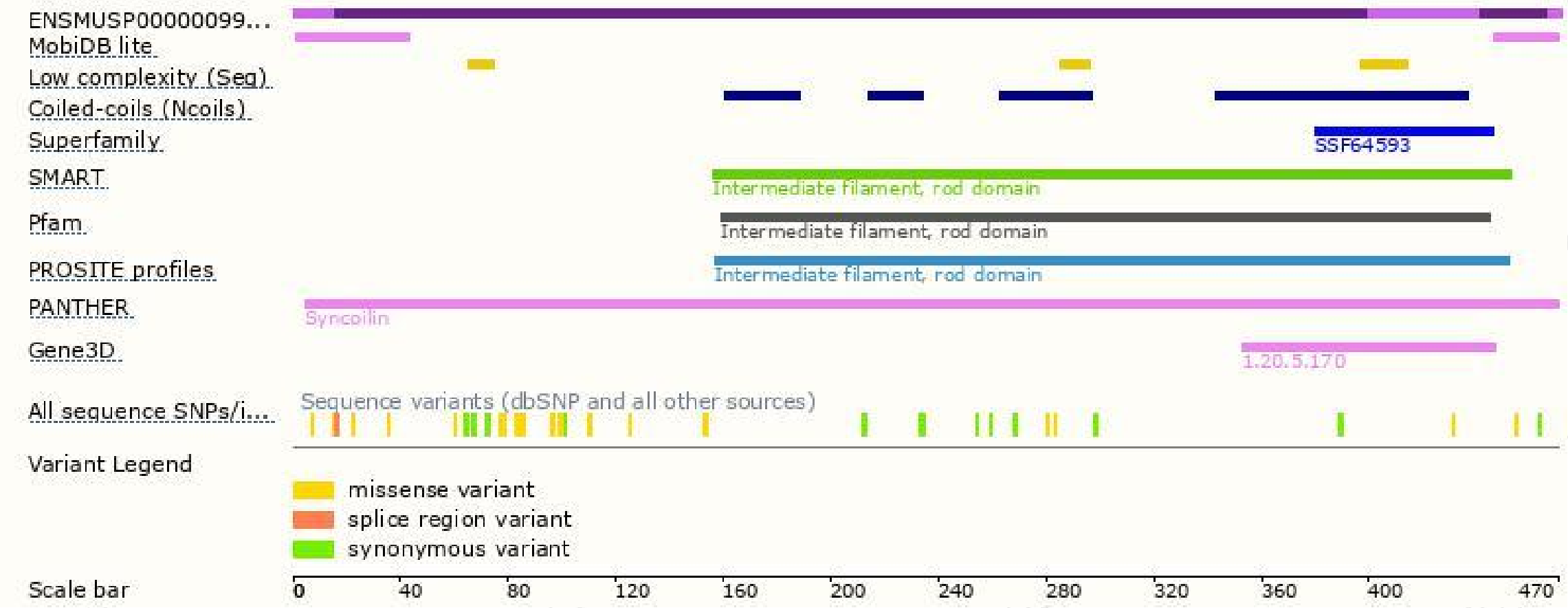
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Sync-201	ENSMUST00000102599.3	2042	470aa	Protein coding	CCDS18687	C0LQ89 Q9EPM5	TSL:1 GENCODE basic APPRIS P1
Sync-202	ENSMUST00000146448.1	2330	No protein	Retained intron	-	-	TSL:1

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

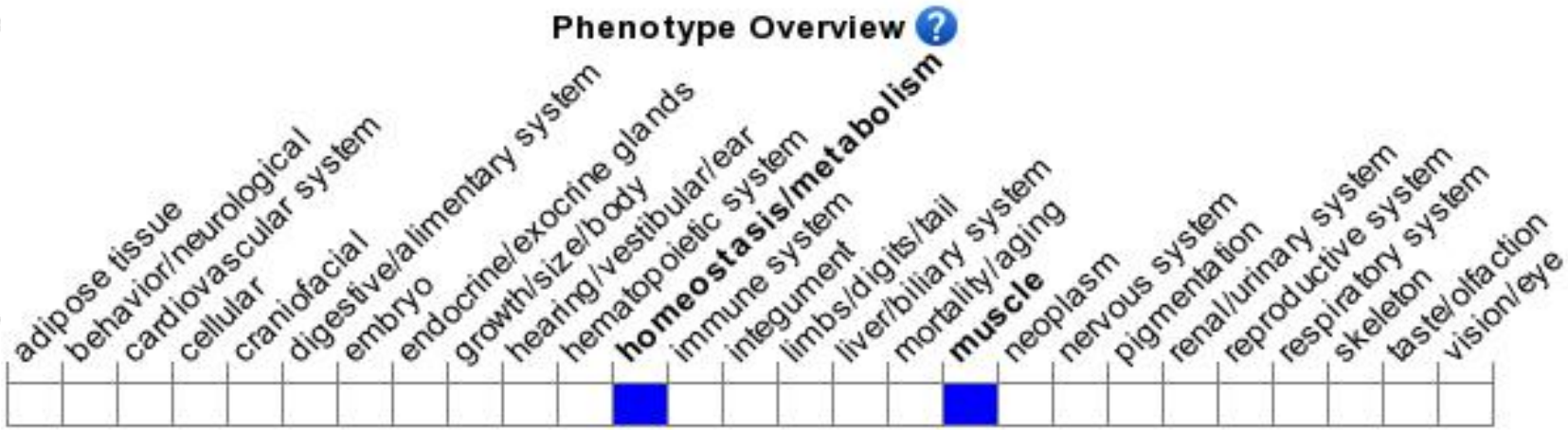
Genomic location distribution



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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