Selenos Cas9-CKO Strategy

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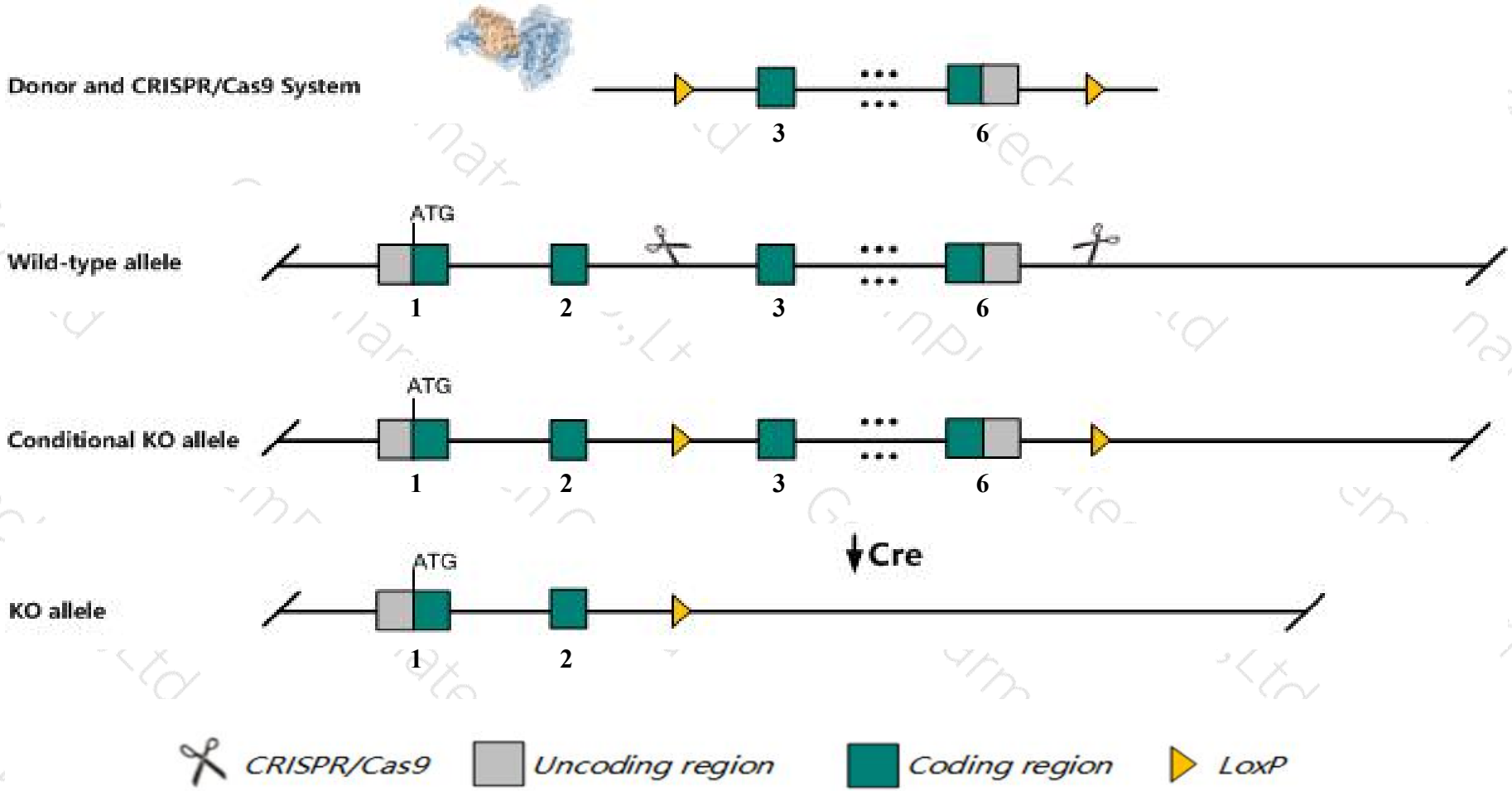
Project Overview

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

Conditional Knockout strategy

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



Technical routes

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- The *Selenos* gene has 5 transcripts. According to the structure of *Selenos* gene, exon3-exon6 of *Selenos-201* (ENSMUST00000101801.6) transcript is recommended as the knockout region.The region contains 362bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Selenos* 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,Mice heterozygous or homozygous for a knock-out allele exhibit impaired contractile function of fast-twitch hindlimb muscles.

- The *Selenos* gene is located on the Chr7. 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）

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Selenos selenoprotein S [Mus musculus (house mouse)]

Gene ID: 109815, updated on 19-Mar-2019

Summary

Official Symbol	Selenos provided by MGI
Official Full Name	selenoprotein S provided byMGI
Primary source	MGI:MGI:95994
See related	Ensembl:ENSMUSG00000075701
Gene type	protein coding
RefSeq status	REVIEWED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	1500011E07Rik, C78786, H-4, H-47, H4, H47, Sels, Seps1, Vimp
Summary	This gene encodes a transmembrane protein that is localized in the endoplasmic reticulum (ER). It is involved in the degradation process of misfolded proteins in the ER, and may also have a role in inflammation control. This protein is a selenoprotein, containing the rare amino acid selenocysteine (Sec). Sec is encoded by the UGA codon, which normally signals translation termination. The 3' UTRs of selenoprotein mRNAs contain a conserved stem-loop structure, designated the Sec insertion sequence (SECIS) element, that is necessary for the recognition of UGA as a Sec codon, rather than as a stop signal. Two additional phylogenetically conserved stem-loop structures (Stem-loop 1 and Stem-loop 2) in the 3' UTR of this mRNA have been shown to function as modulators of Sec insertion (PMID:23614019). Alternatively spliced transcript variants have been found for this gene. [provided by RefSeq, Jul 2017]
Expression	Ubiquitous expression in placenta adult (RPKM 73.8), testis adult (RPKM 50.8) and 28 other tissuesSee more
Orthologs	human all

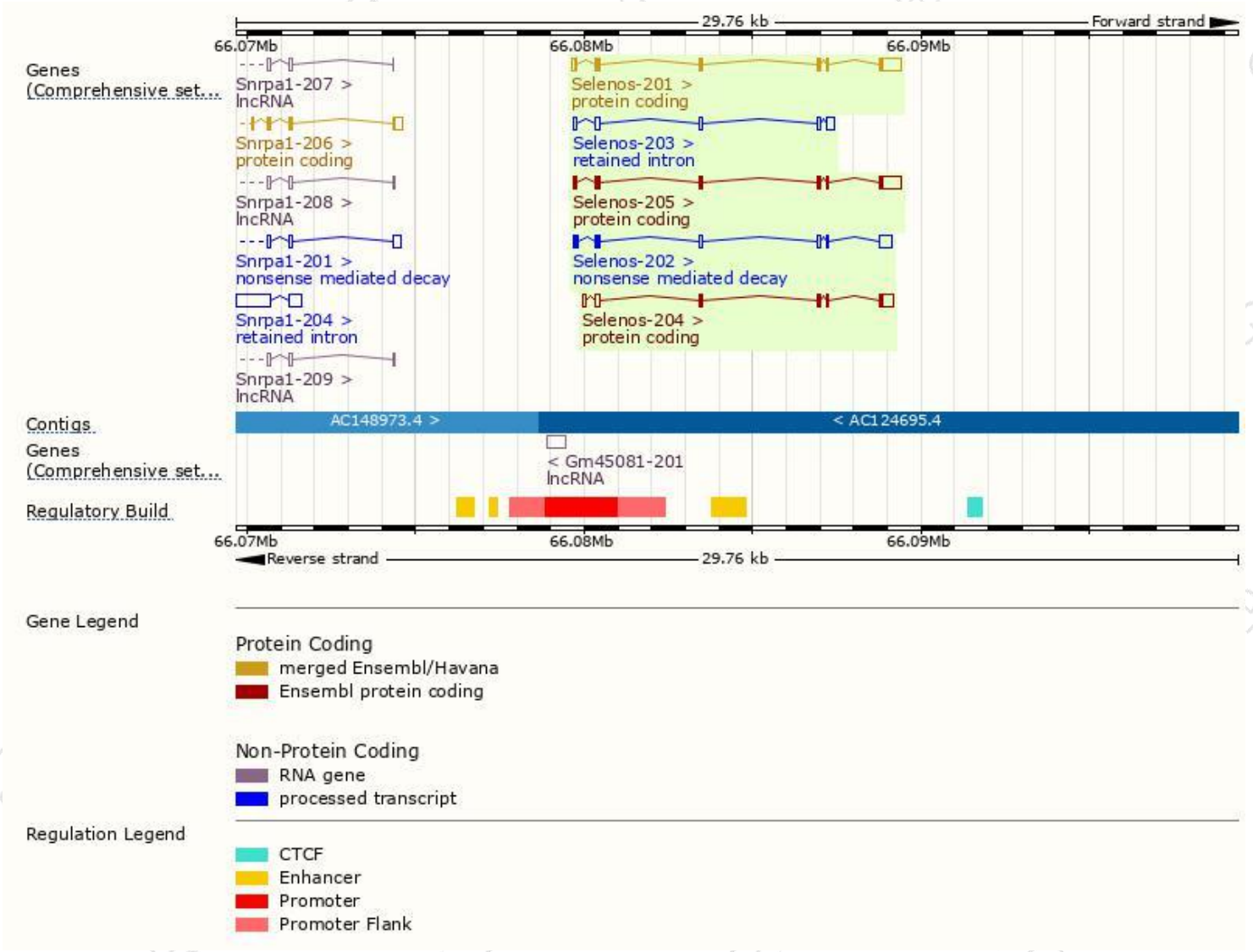
Transcript information（Ensembl）

The gene has 5 transcripts,all transcripts are shown below:

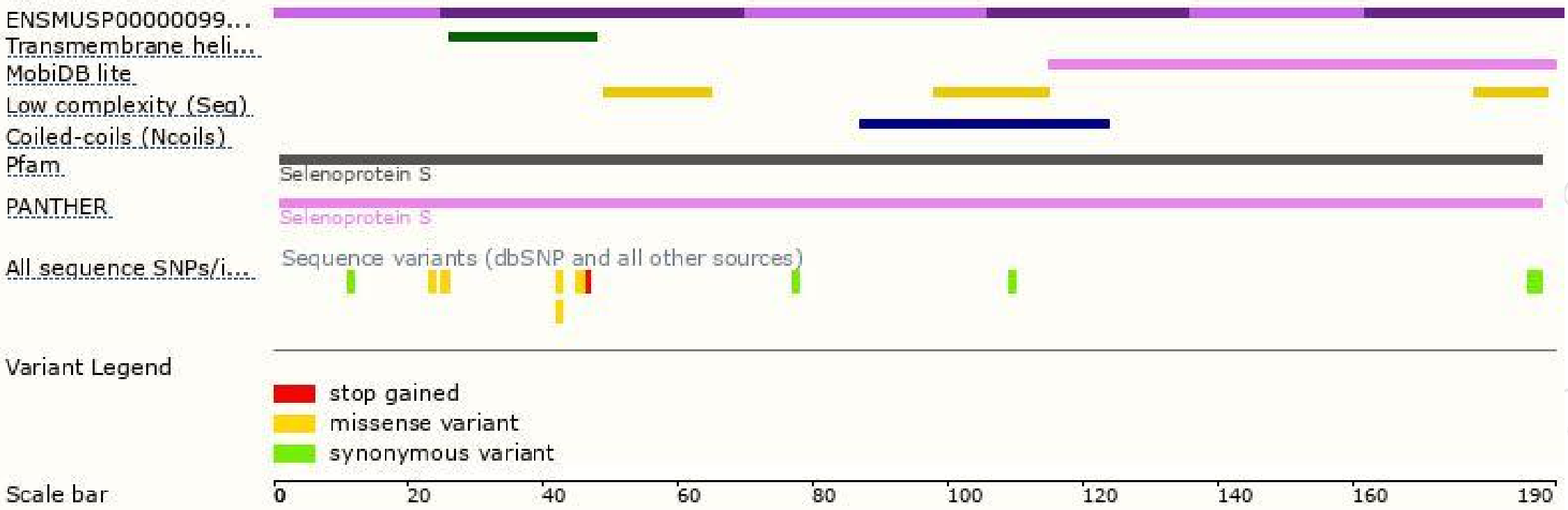
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Selenos-201	ENSMUST00000101801.6	1191	190aa	Protein coding	CCDS39977	Q9BCZ4	TSL:1 GENCODE basic APPRIS P2
Selenos-205	ENSMUST00000206575.1	1157	187aa	Protein coding	-	A0A0U1RP62	TSL:2 GENCODE basic APPRIS ALT1
Selenos-204	ENSMUST00000206044.1	911	100aa	Protein coding	-	A0A0U1RPI8	TSL:3 GENCODE basic
Selenos-202	ENSMUST00000205279.1	897	64aa	Nonsense mediated decay	-	A0A0U1RQ25	TSL:3
Selenos-203	ENSMUST00000205965.1	702	No protein	Retained intron	-	-	TSL:2

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

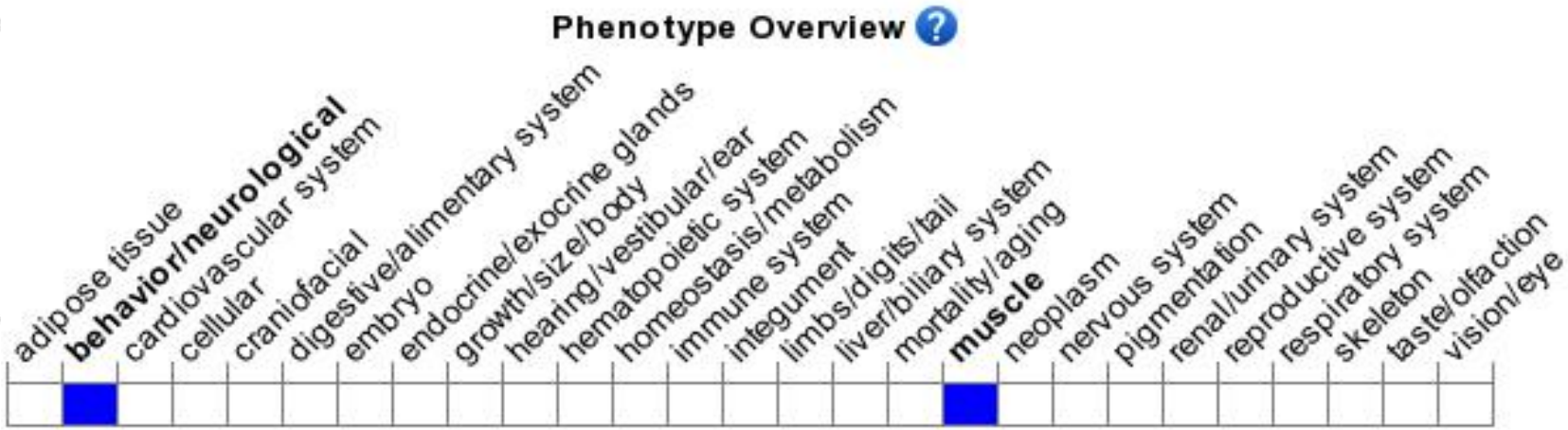
Genomic location distribution



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,Mice heterozygous or homozygous for a knock-out allele exhibit impaired contractile function of fast-twitch hindlimb muscles.

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

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