Selenoi Cas9-CKO Strategy

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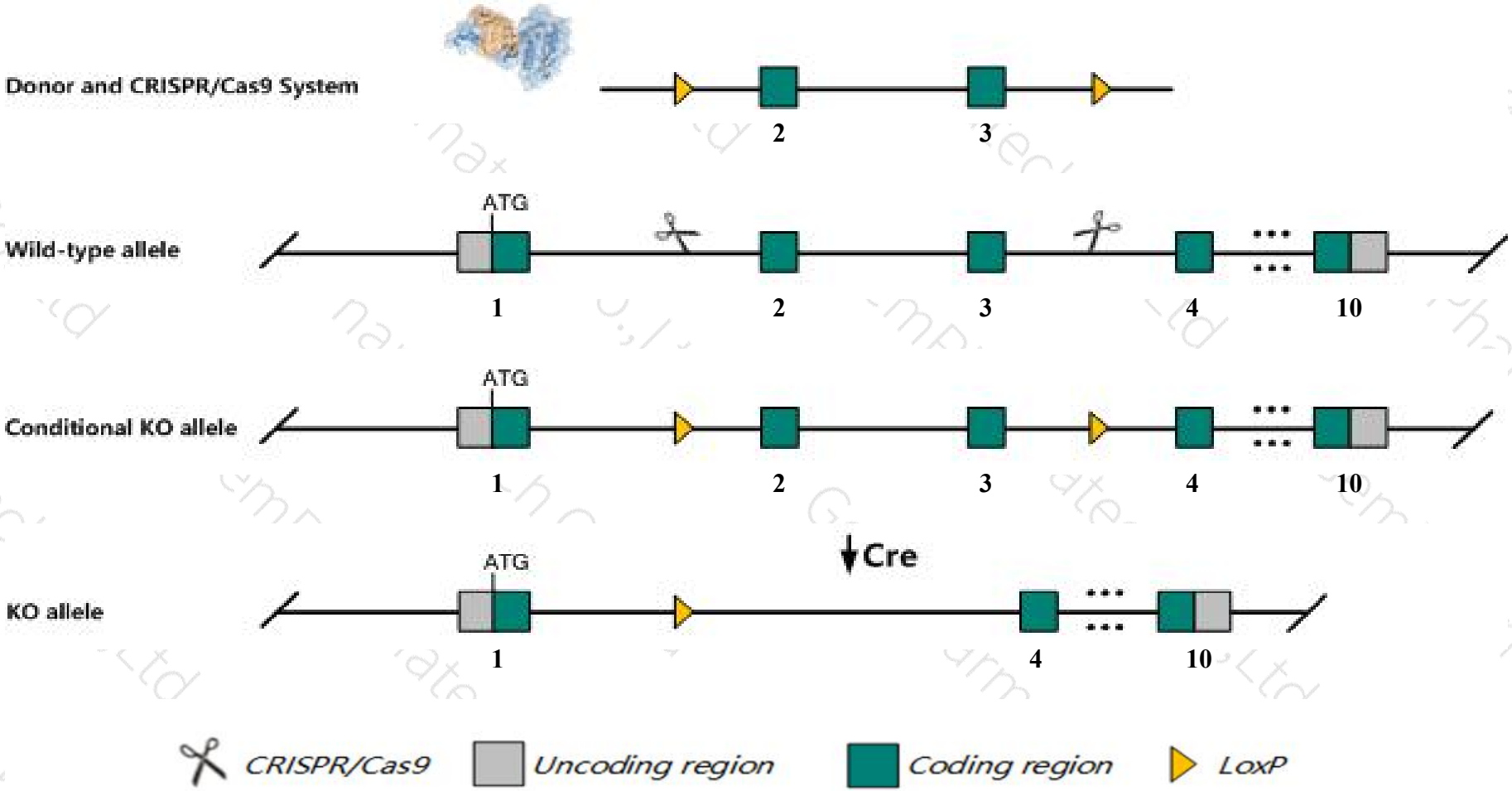
Project Overview

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

Conditional Knockout strategy

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



Technical routes

➢ The *Selenoi* gene has 8 transcripts. According to the structure of *Selenoi* gene, exon2-exon3 of *Selenoi-203*(ENSMUST00000145167.7) transcript is recommended as the knockout region.The region contains 178bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Selenoi* 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

➢ The *Selenoi* gene is located on the Chr5. 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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Selenoi selenoprotein I [Mus musculus (house mouse)]

Gene ID: 28042, updated on 13-Mar-2020

Summary

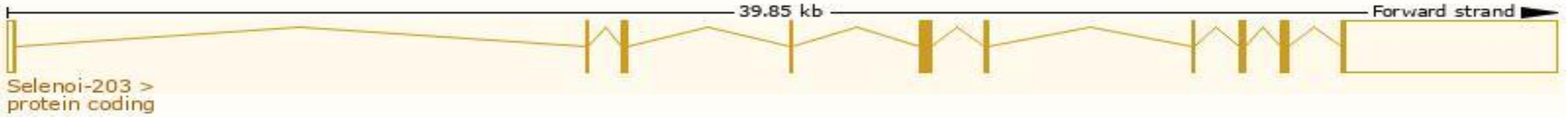
Official Symbol	Selenoi provided by MGI
Official Full Name	selenoprotein I provided by MGI
Primary source	MGI:MGI:107898
See related	Ensembl:ENSMUSG00000075703
Gene type	protein coding
RefSeq status	REVIEWED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	4933402G07Rik, AI448296, AI452230, C79563, D5Wsu178e, Ept1, SELI, mKIAA1724
Summary	The multi-pass transmembrane protein encoded by this gene belongs to the CDP-alcohol phosphatidyltransferase class-I family. It catalyzes the transfer of phosphoethanolamine from CDP-ethanolamine to diacylglycerol to produce phosphatidylethanolamine, which is involved in the formation and maintenance of vesicular membranes, regulation of lipid metabolism, and protein folding. This protein is a selenoprotein, containing the rare selenocysteine (Sec) amino acid at its active site. 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. Alternatively spliced transcript variants have been found for this gene. [provided by RefSeq, Jul 2016]
Expression	Ubiquitous expression in CNS E18 (RPKM 9.7), large intestine adult (RPKM 8.8) and 28 other tissuesSee more
Orthologs	human all

Transcript information（Ensembl）

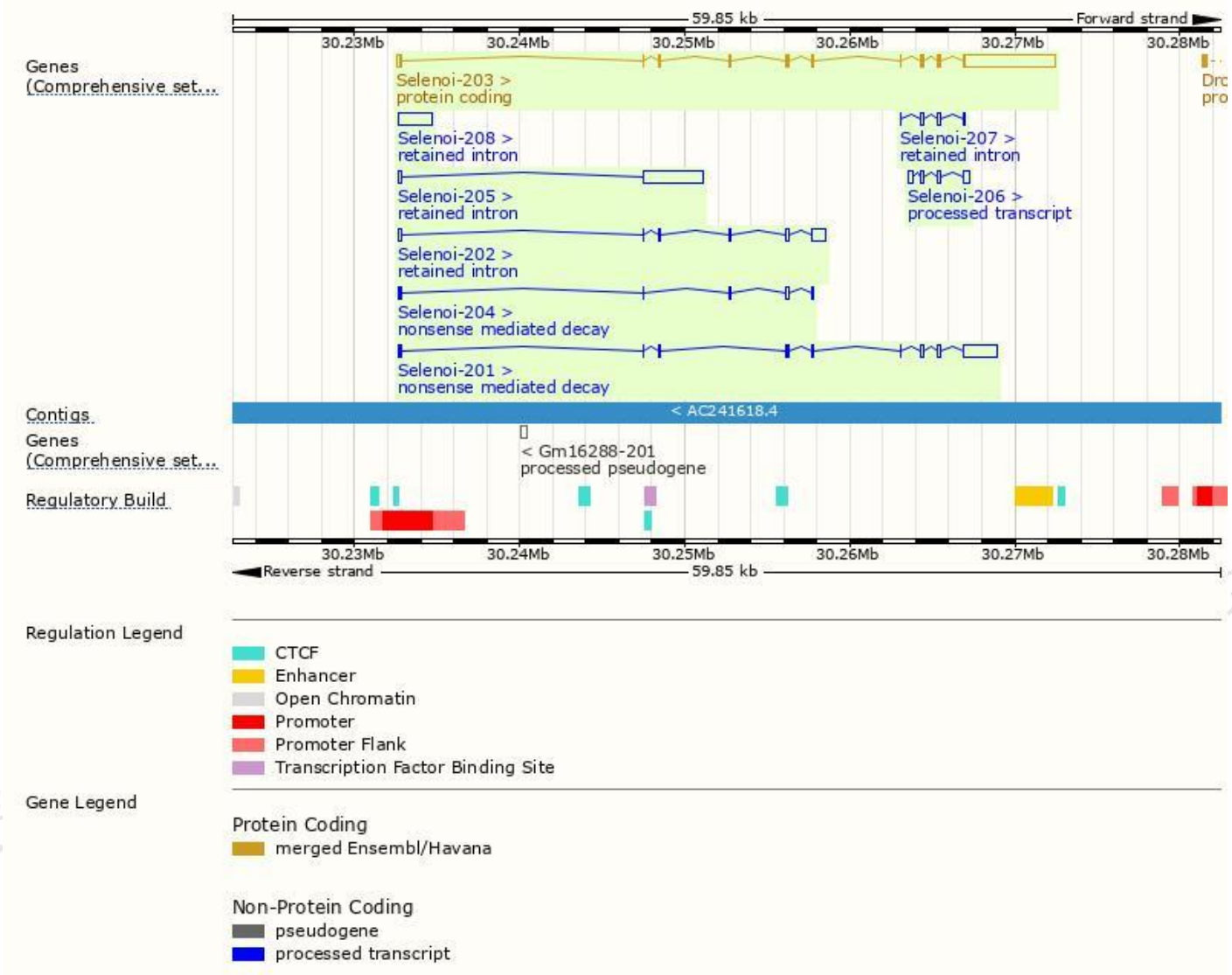
The gene has 8 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Selenoi-203	ENSMUST00000145167.7	6803	398aa	Protein coding	CCDS51451	Q80TA1	TSL:1 GENCODE basic APPRIS P1
Selenoi-201	ENSMUST00000132404.7	3122	198aa	Nonsense mediated decay	-	Q8CET7	TSL:1
Selenoi-204	ENSMUST00000145858.7	638	66aa	Nonsense mediated decay	-	D6RE20	TSL:1
Selenoi-206	ENSMUST00000151795.2	1028	No protein	Processed transcript	-	-	TSL:1
Selenoi-205	ENSMUST00000151468.1	3790	No protein	Retained intron	-	-	TSL:1
Selenoi-208	ENSMUST00000198788.1	2039	No protein	Retained intron	-	-	TSL:NA
Selenoi-202	ENSMUST00000138001.7	1511	No protein	Retained intron	-	-	TSL:2
Selenoi-207	ENSMUST00000197299.4	516	No protein	Retained intron	-	-	TSL:3

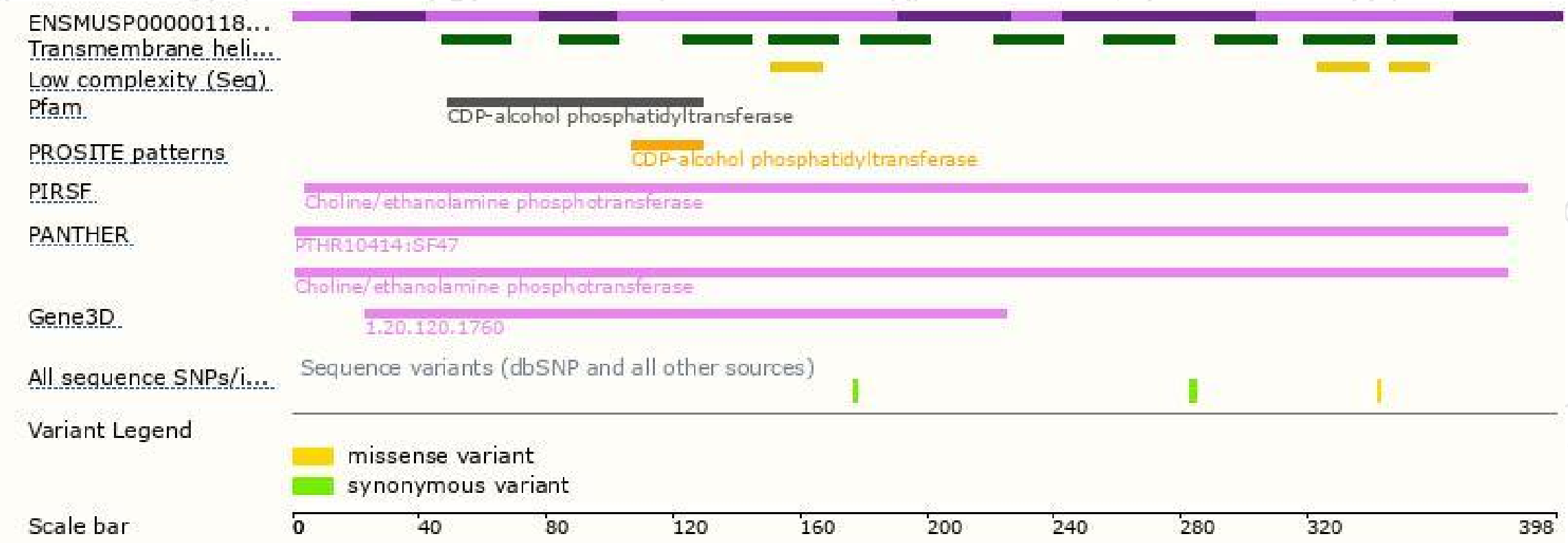
The strategy is based on the design of *Selenoi-203* transcript,the transcription is shown below:



Genomic location distribution



Protein domain



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