Slc30a1 Cas9-CKO Strategy

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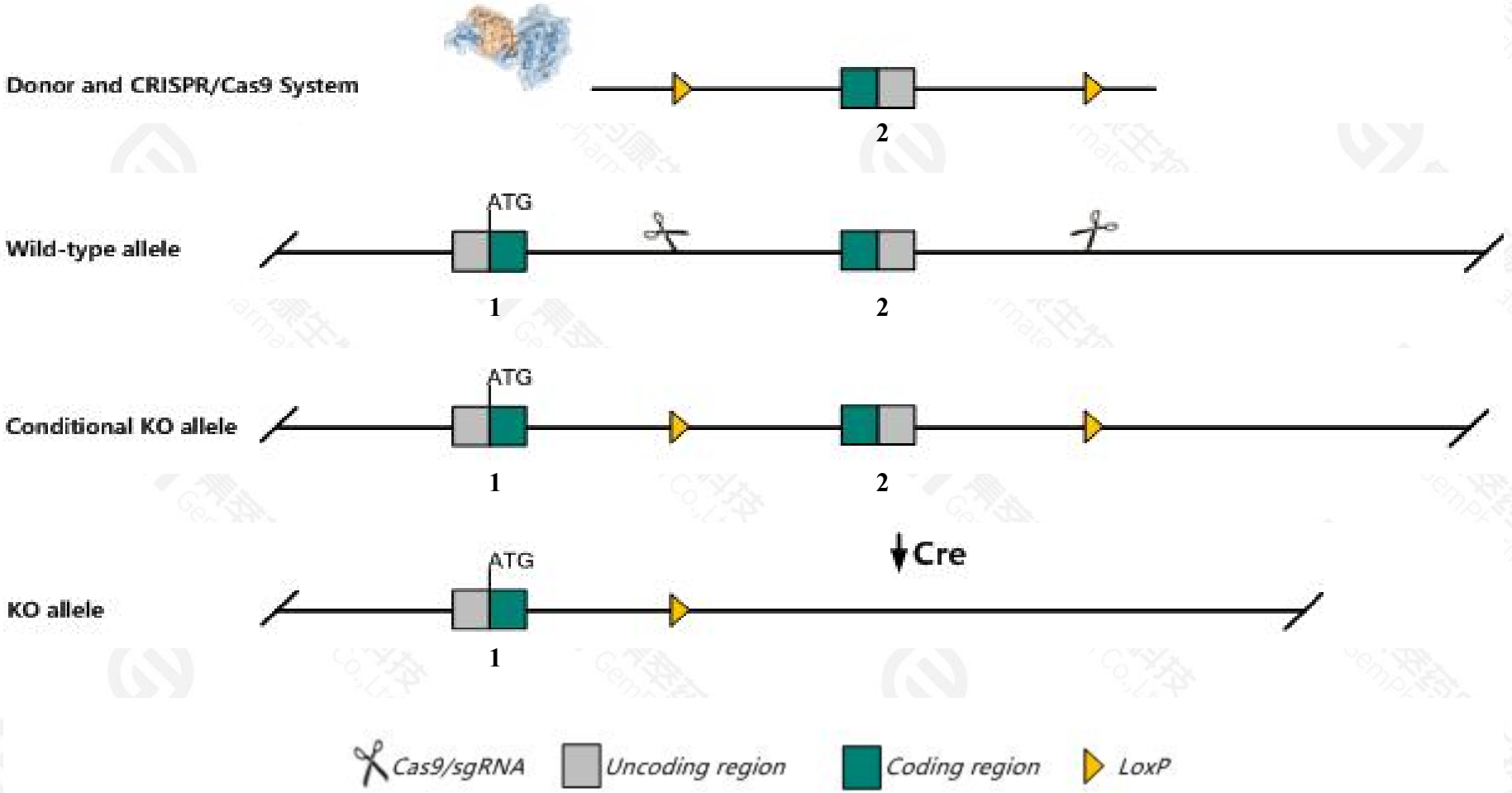
Project Overview

Project Name	***Slc30a1***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Slc30a1* gene. The schematic diagram is as follows:



Technical routes

➢ The *Slc30a1* gene has 2 transcripts. According to the structure of *Slc30a1* gene, exon2 of *Slc30a1-201*(ENSMUST00000044954.7) transcript is recommended as the knockout region.The region contains part of coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Slc30a1* gene. The brief process is as follows:sgRNA was transcribed in vitro, donor was constructed.Cas9, sgRNA 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 was 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,homozygous mutation of this gene results in embryonic lethality soon after implantation with embryonic growth arrest at the egg cylinder stage. Embryos from heterozygous females on a zinc deficient diet develop abnormally.

➢ The N-terminal of *Slc30a1* gene will remain several amino acids, it may remain the partial function of *Slc30a1* gene.

➢ The KO region is close to *1700034H15Rik* gene.Knockout the region may affect the function of *1700034H15Rik* gene.

➢ The *Slc30a1* gene is located on the Chr1. 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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Slc30a1 solute carrier family 30 (zinc transporter), member 1 [Mus musculus (house mouse)]

Gene ID: 22782, updated on 4-Feb-2021

Summary

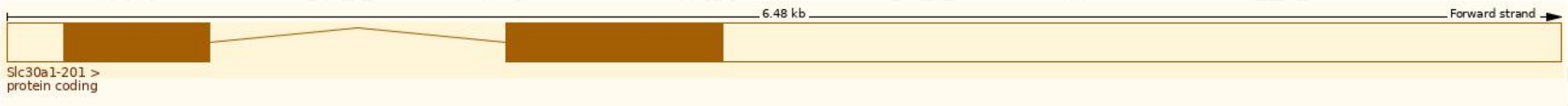
Official Symbol	Slc30a1 provided by MGI
Official Full Name	solute carrier family 30 (zinc transporter), member 1 provided by MGI
Primary source	MGI:MGI:1345281
See related	Ensembl:ENSMUSG00000037434
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	AI839647, C130040I11Rik, Znt, Znt1
Expression	Ubiquitous expression in placenta adult (RPKM 14.4), colon adult (RPKM 12.4) and 28 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

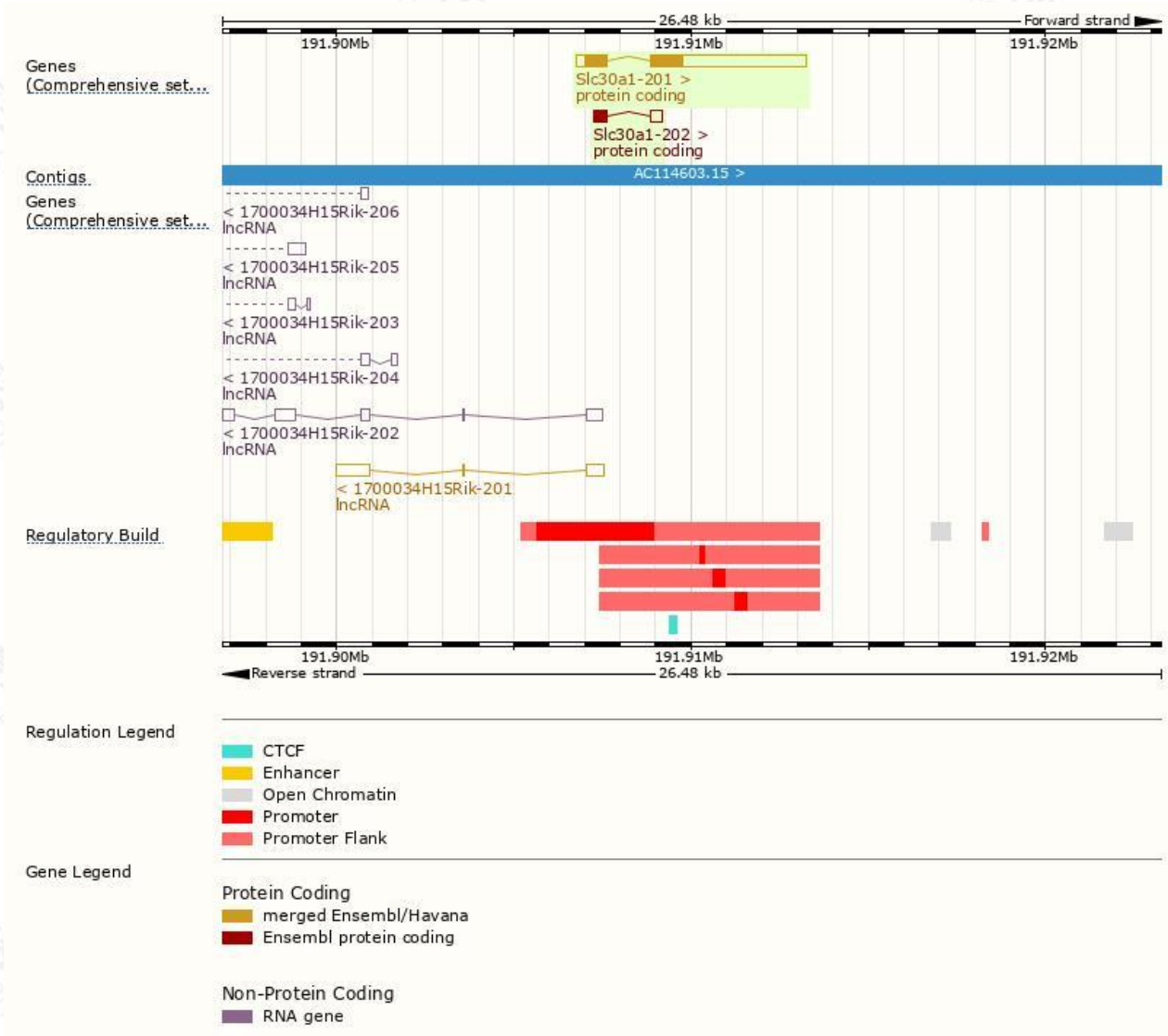
The gene has 2 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Slc30a1-201	ENSMUST00000044954.7	5244	503aa	Protein coding	CCDS15625		TSL:1 , GENCODE basic , APPRIS P1 ,
Slc30a1-202	ENSMUST00000161756.2	677	122aa	Protein coding	-		CDS 5' incomplete , TSL:3 ,

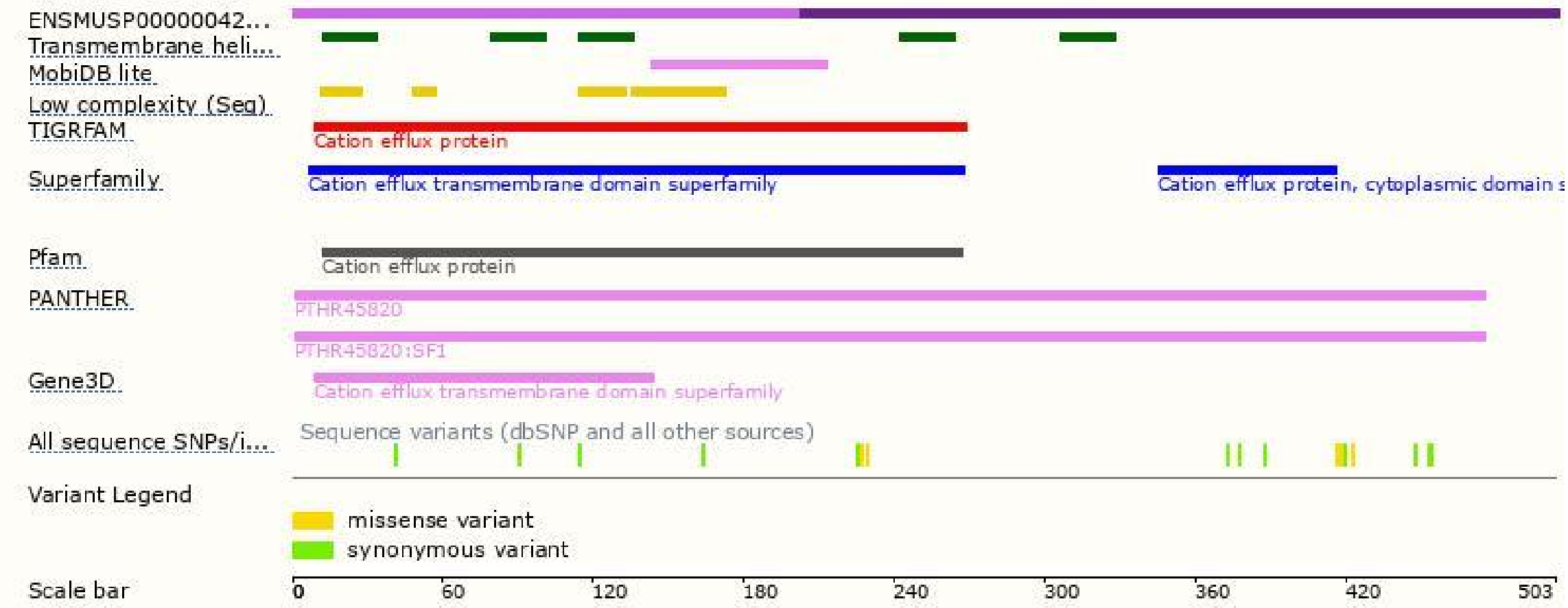
The strategy is based on the design of *Slc30a1-201* transcript,the transcription is shown below:



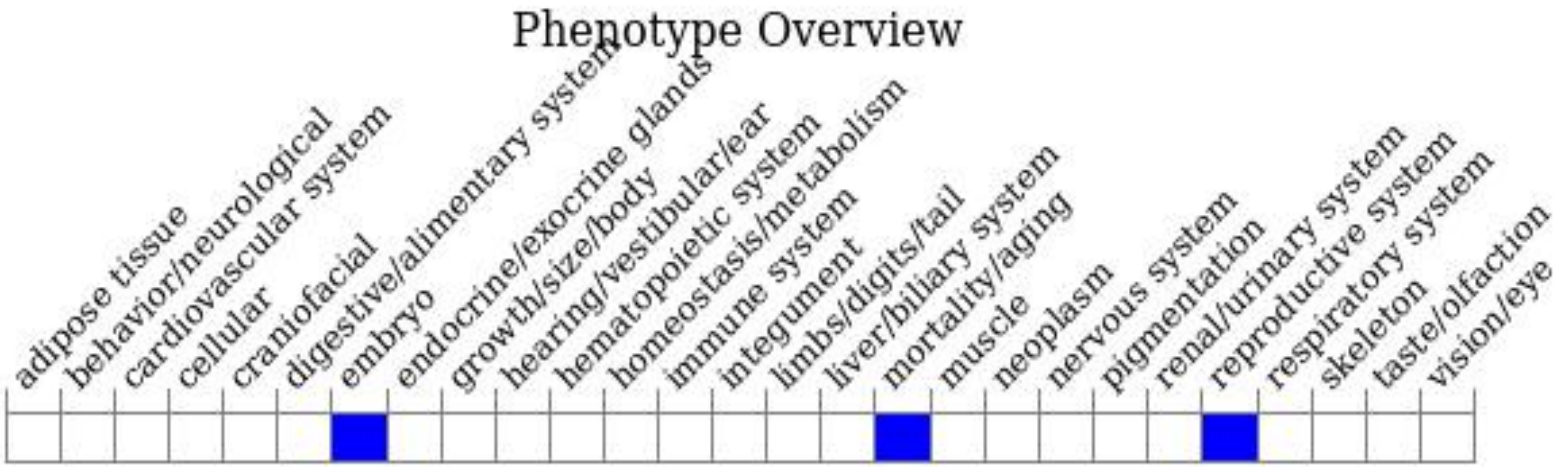
Genomic location distribution



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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