Magt1 Cas9-KO Strategy

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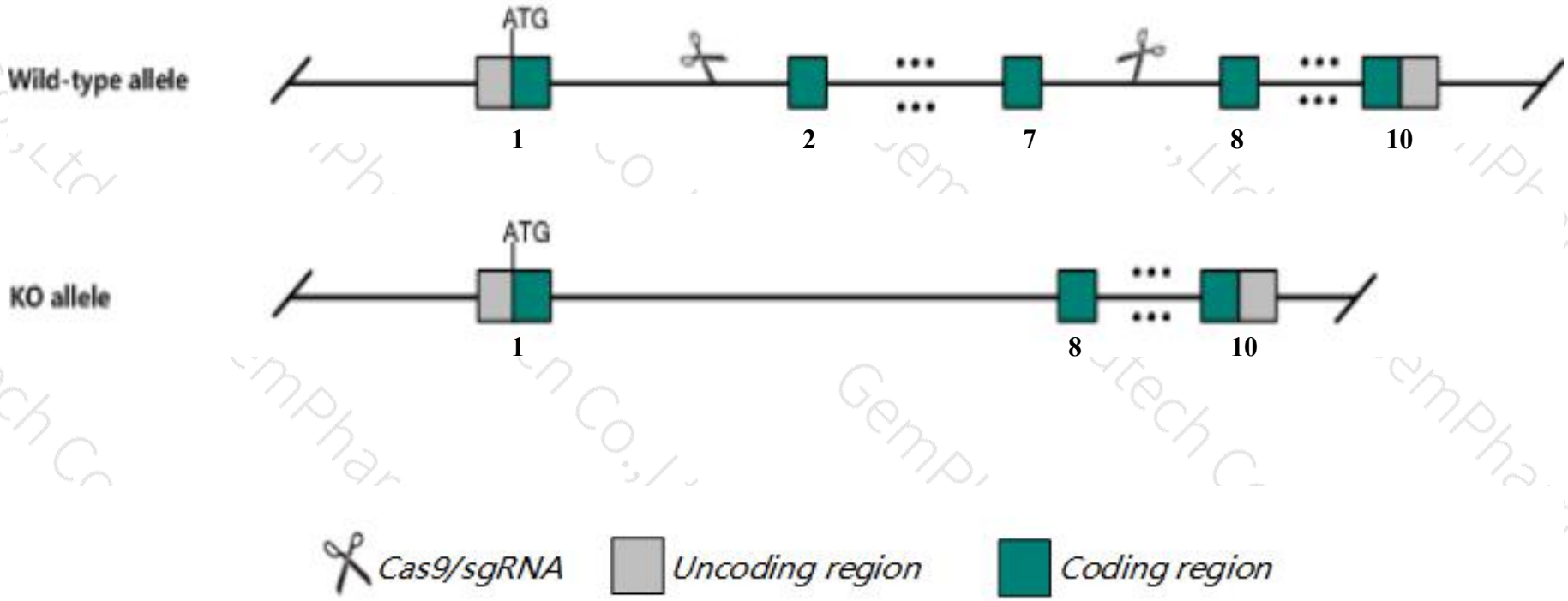
Design Date: 2021-1-8

Project Overview

Project Name	***Magt1***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Magt1* gene. The schematic diagram is as follows:



Technical routes

➢ The *Magt1* gene has 5 transcripts. According to the structure of *Magt1* gene, exon2-exon7 of *Magt1-205*(ENSMUST00000238718.1) transcript is recommended as the knockout region.The region contains 724bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Magt1* gene. The brief process is as follows: sgRNA was transcribed in vitro.Cas9 and sgRNA 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.

Notice

➢ According to the existing MGI data,male mice hemizygous for one gene trap allele exhibit decreased T cell number and increased B cell numbers with increased activation.

➢ The *Magt1* gene is located on the ChrX. 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 gene knockout on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

Gene information（NCBI）

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Magt1 magnesium transporter 1 [Mus musculus (house mouse)]

Gene ID: 67075, updated on 13-Mar-2020

Summary

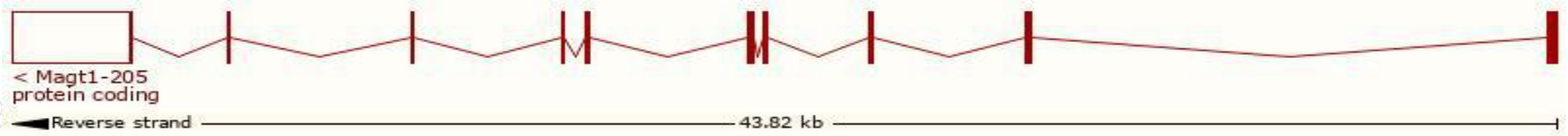
Official Symbol	Magt1 provided by MGI
Official Full Name	magnesium transporter 1 provided by MGI
Primary source	MGI:MGI:1914325
See related	Ensembl:ENSMUSG00000031232
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	2410001C15Rik, 2610529C04Rik, 2810482I07Rik, IAG2, IAP
Expression	Ubiquitous expression in placenta adult (RPKM 16.4), limb E14.5 (RPKM 8.4) and 27 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

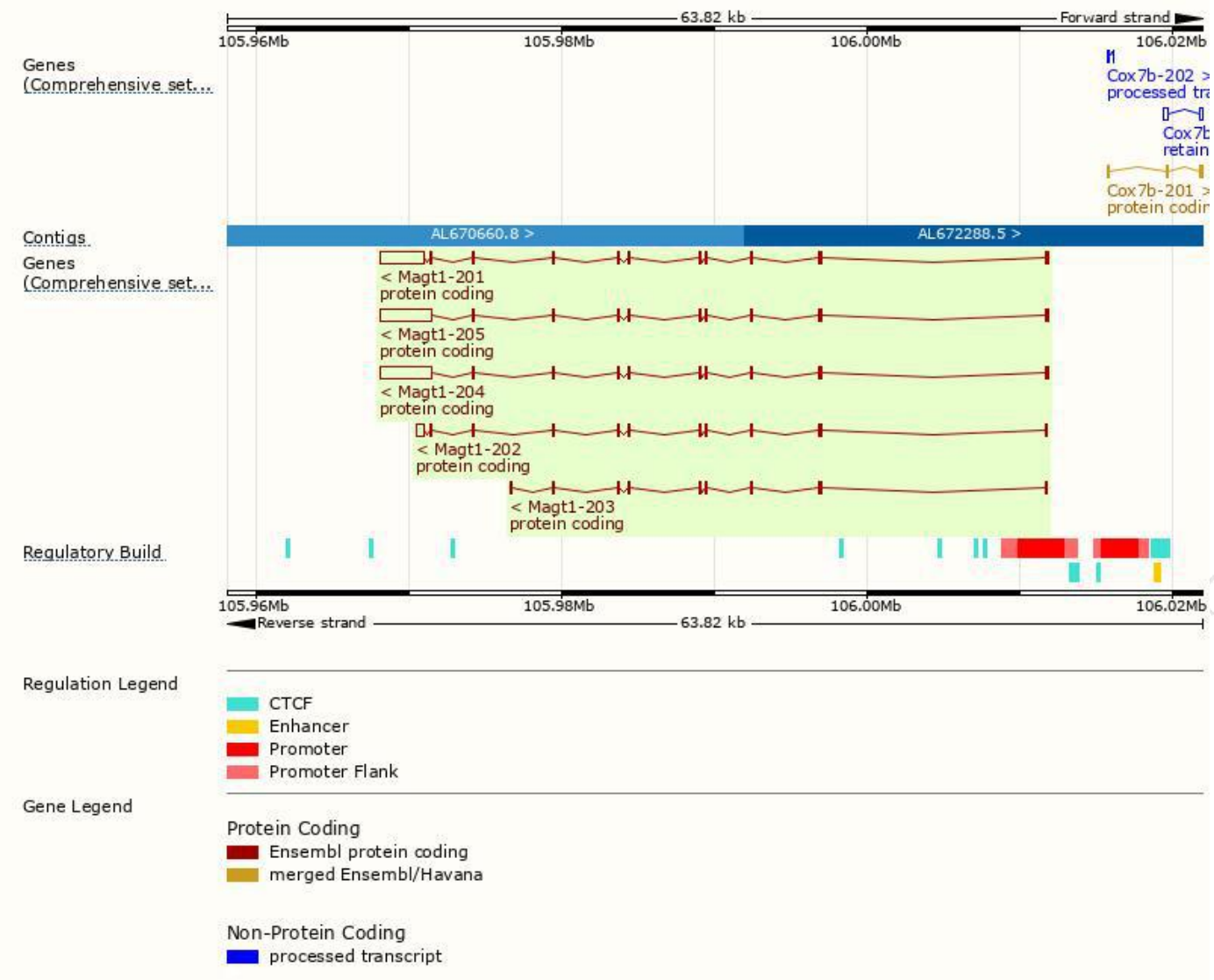
The gene has 5 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Magt1-205	ENSMUST00000238718.1	4524	368aa	Protein coding	CCDS53168	-	GENCODE basic APPRIS P2
Magt1-201	ENSMUST00000033583.13	4115	368aa	Protein coding	CCDS53168	A2ADH1	TSL:1 GENCODE basic APPRIS P2
Magt1-204	ENSMUST00000151689.8	4531	335aa	Protein coding	-	A2ADH1 Q9CQY5	TSL:1 GENCODE basic APPRIS ALT2
Magt1-202	ENSMUST00000113566.9	1608	335aa	Protein coding	-	F6WHL0 Q9CQY5	TSL:1 GENCODE basic APPRIS ALT2
Magt1-203	ENSMUST00000139421.2	1059	306aa	Protein coding	-	F6TBV1	TSL:1 GENCODE basic APPRIS ALT2

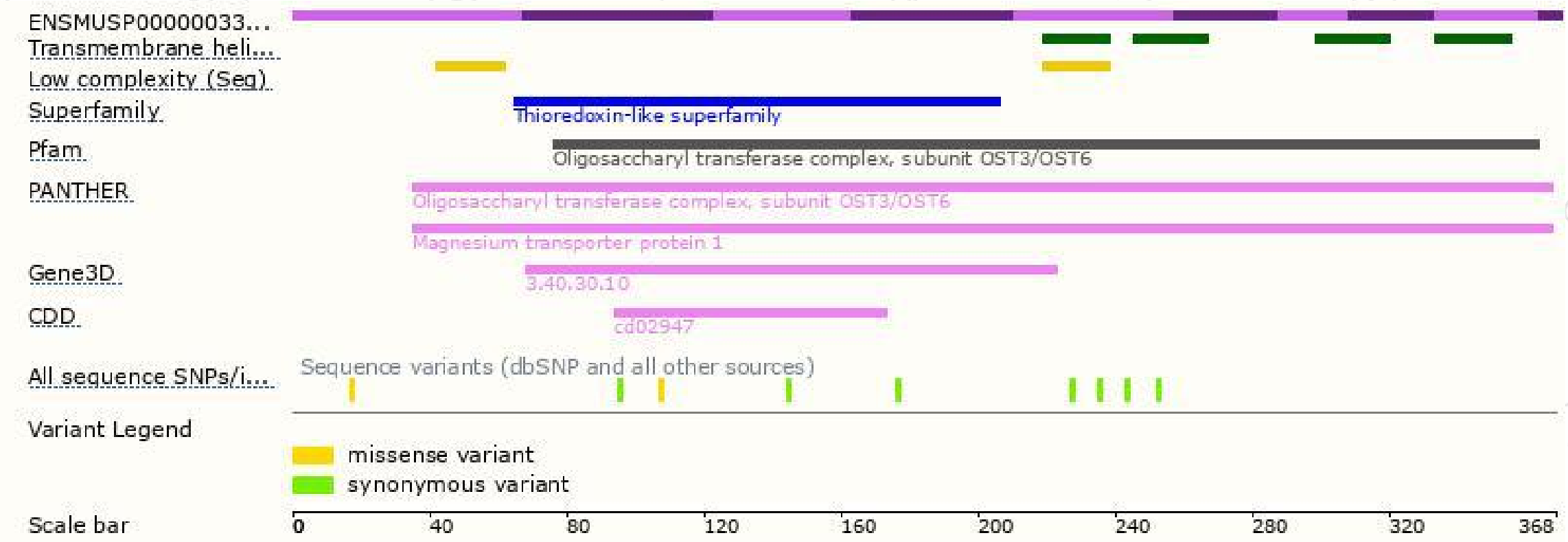
The strategy is based on the design of *Magt1-205* transcript,the transcription is shown below:



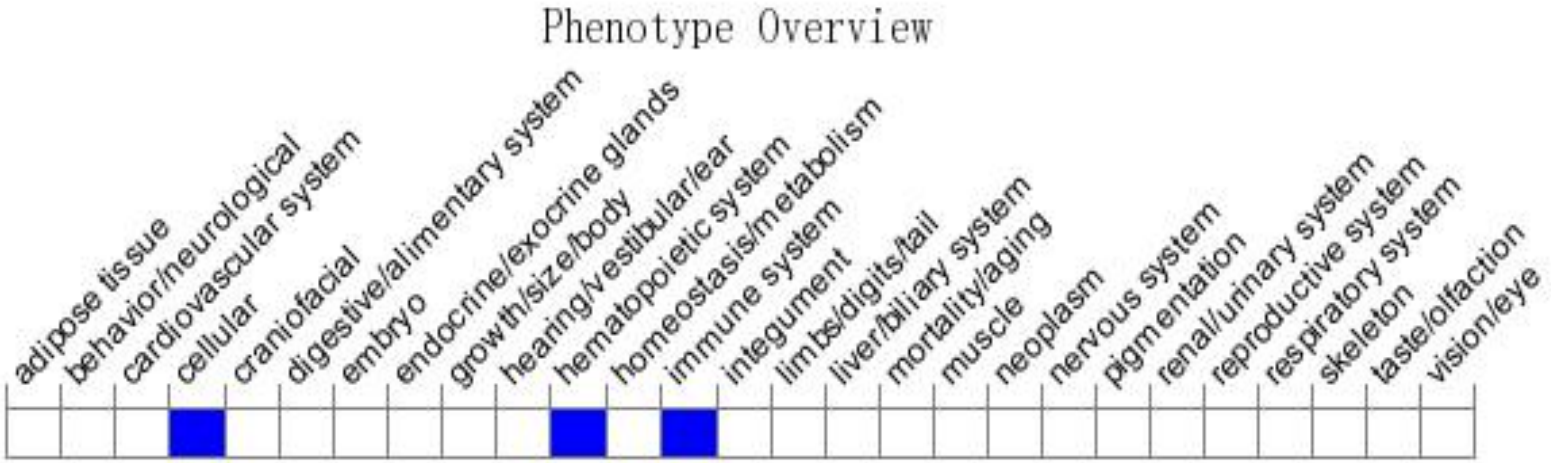
Genomic location distribution



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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