

H2Ab1 Cas9-KO Strategy

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Project Overview



Project Name

H2Ab1

Project type

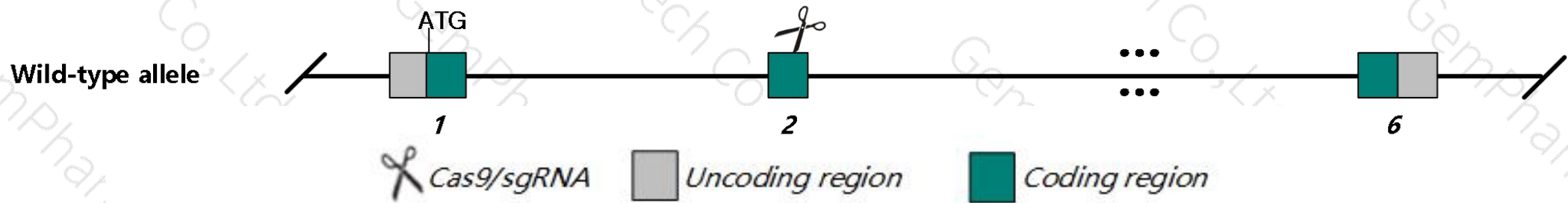
Cas9-KO

Strain background

NOD/ShiLtJ

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *H2Ab1* gene. The schematic diagram is as follows:



- The *H2Ab1* gene has 3 transcripts. According to the structure of *H2Ab1* gene, exon2 part of the coding area of MGP_NODShiLtJ_T0046770.1 transcript is recommended as the knockout region. The region contains key coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *H2Ab1* gene. The brief process is as follows: sgRNA was transcribed in vitro. Cas9 and sgRNA were microinjected into the fertilized eggs of NOD/ShiLtJ 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 NOD/ShiLtJ mice.

- According to the existing MGI data, Homozygotes for targeted null mutations exhibit depletion of mature CD4⁺ T cells, deficiency in cell-mediated immune responses, and increased susceptibility to viral infections.
- The *H2Ab1* gene is located on the Chr17. 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 gene transcription and translation processes, all risks cannot be predicted under existing information.

Gene information (NCBI)

H2-Ab1 histocompatibility 2, class II antigen A, beta 1 [*Mus musculus* (house mouse)]

Gene ID: 14961, updated on 28-May-2019

Summary

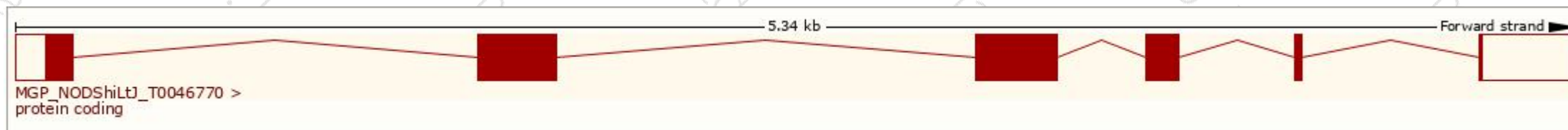
Official Symbol	H2-Ab1 provided by MGI
Official Full Name	histocompatibility 2, class II antigen A, beta 1 provided by MGI
Primary source	MGI:MGI:103070
See related	Ensembl:ENSMUSG00000073421
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	IAb; Ia2; Ia-2; Abeta; H-2Ab; H2-Ab; Rmcs1; I-Abeta; AI845868
Expression	Biased expression in spleen adult (RPKM 2279.6), large intestine adult (RPKM 1316.2) and 12 other tissues See more

Transcript information (Ensembl)

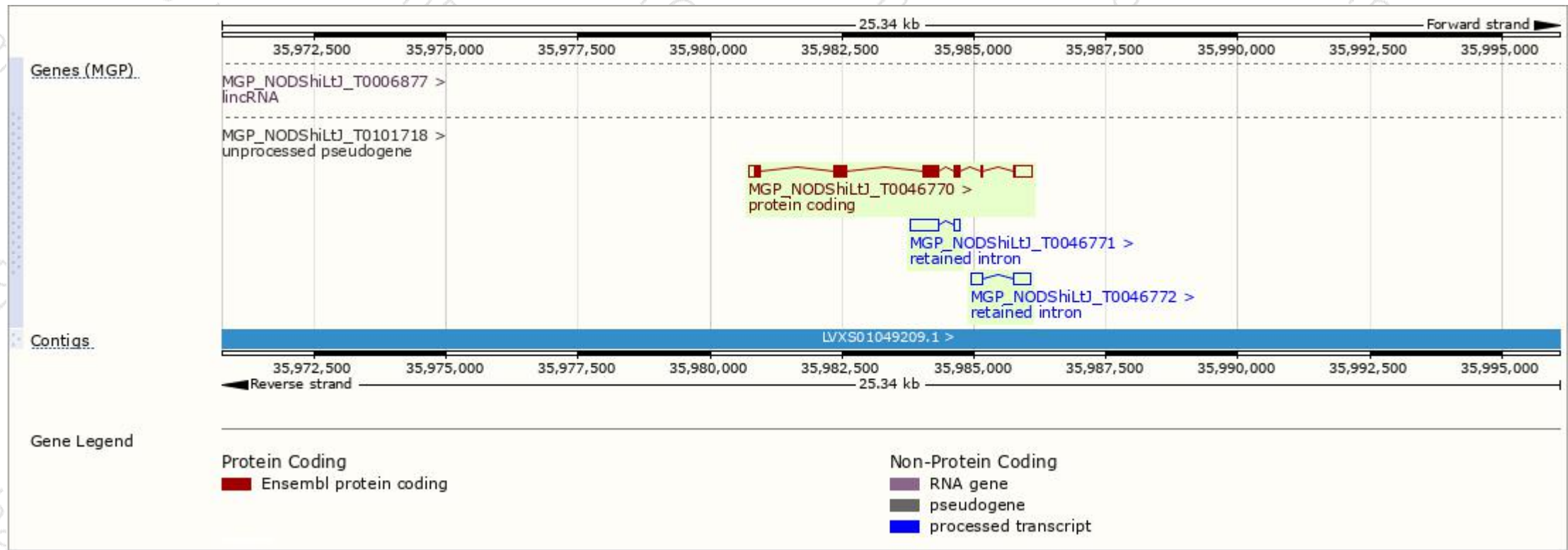
The gene has 3 transcripts, all transcripts are shown below:

Show/hide columns (1 hidden)		Filter					
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
-	MGP_NODShiLtJ_T0046770.1	1205	263aa	Protein coding	CCDS37583	P14483 Q3TD53	-
-	MGP_NODShiLtJ_T0046771.1	629	No protein	Retained intron	-	-	-
-	MGP_NODShiLtJ_T0046772.1	519	No protein	Retained intron	-	-	-

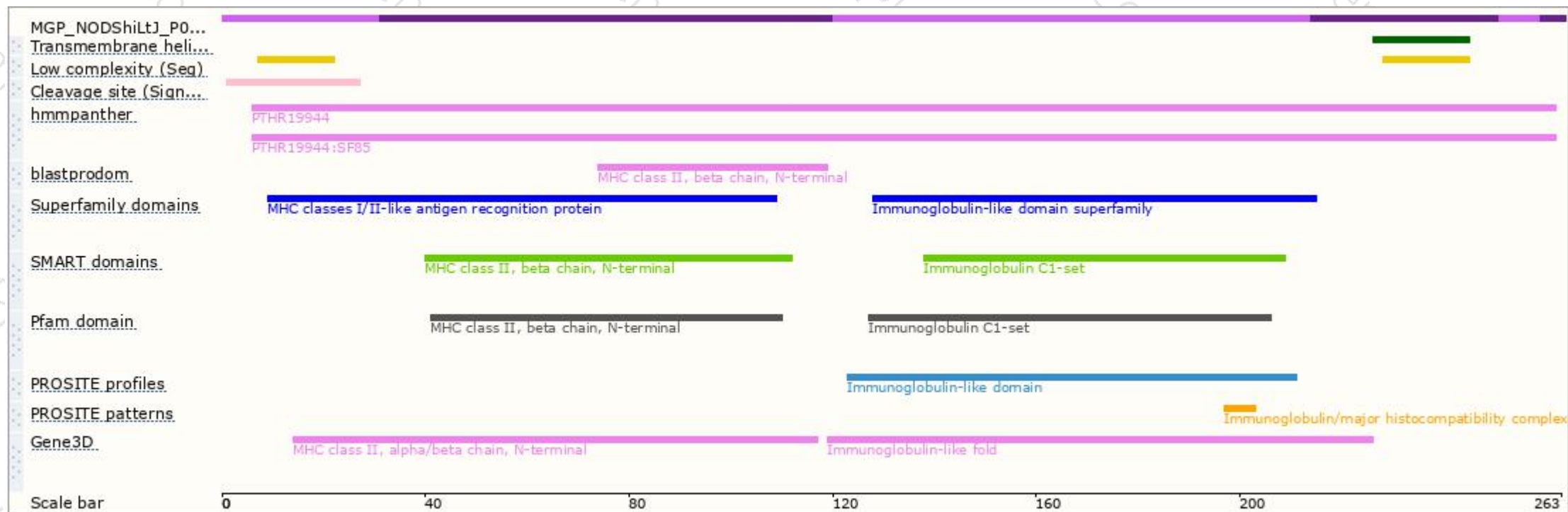
The strategy is based on the design of *MGP_NODShiLtJ_T0046770.1* transcript, The transcription is shown below



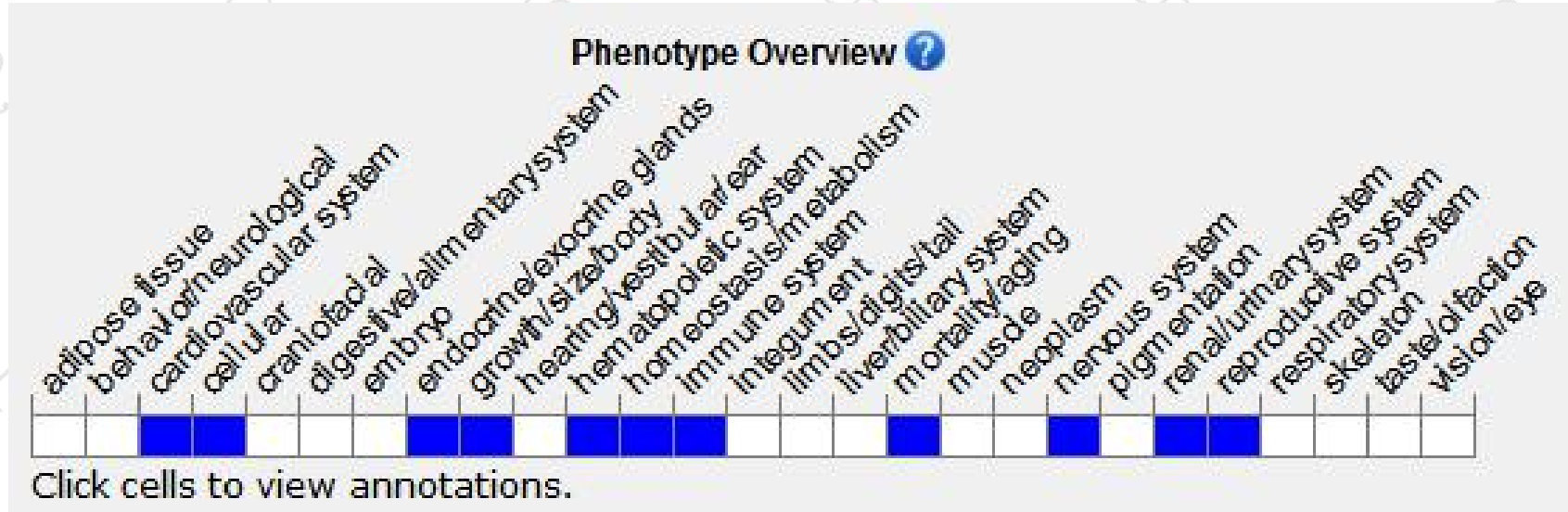
Genomic location distribution



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, Homozygotes for targeted null mutations exhibit depletion of mature CD4⁺ T cells, deficiency in cell-mediated immune responses, and increased susceptibility to viral infections.

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

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