Mep1b Cas9-KO Strategy

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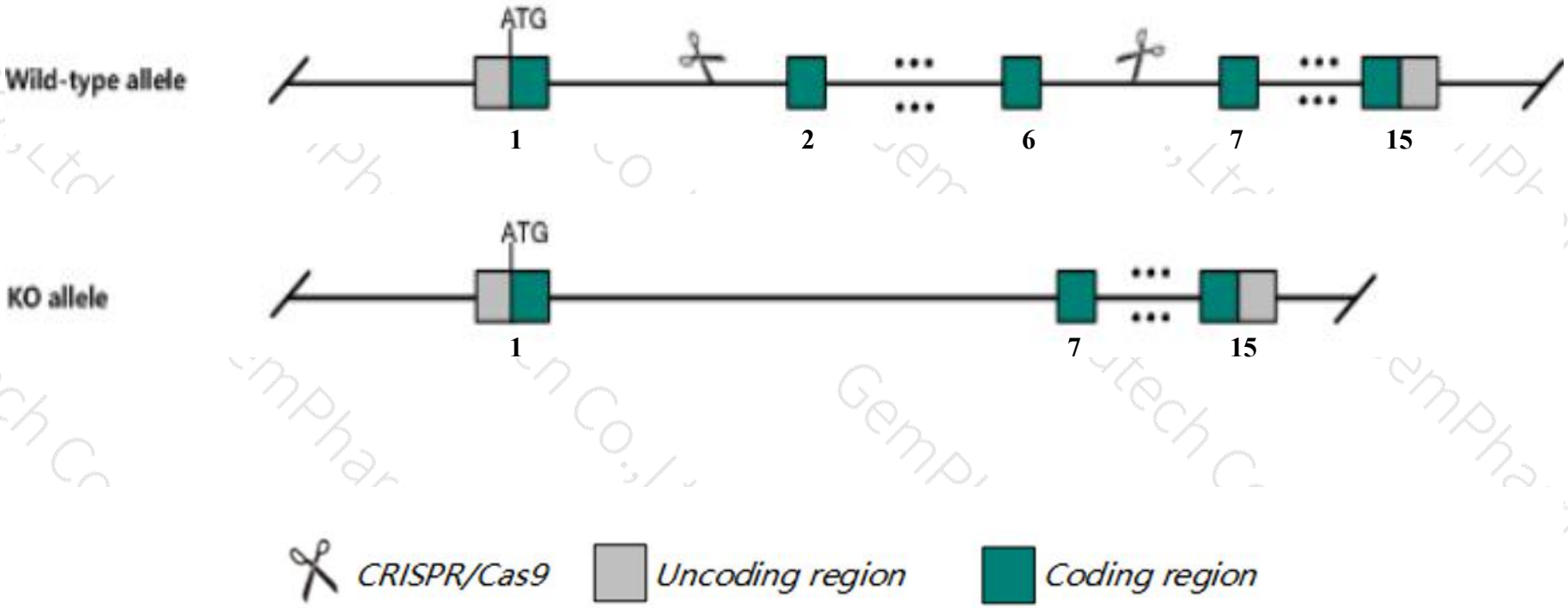
Design Date: 2020-7-20

Project Overview

Project Name	***Mep1b***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Mep1b* gene. The schematic diagram is as follows:



Technical routes

➢ The *Mep1b* gene has 3 transcripts. According to the structure of *Mep1b* gene, exon2-exon6 of *Mep1b-201*(ENSMUST00000082235.4) transcript is recommended as the knockout region.The region contains 308bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Mep1b* gene. The brief process is as follows: CRISPR/Cas9 system 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,homozygotes for a targeted null mutation exhibit 50% prenatal lethality; survivors have reduced birth weight and show altered renal gene expression, but otherwise are apparently normal.

➢ *Gm6378* gene will be deleted.

➢ The *Mep1b* gene is located on the Chr18. 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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Mep1b meprin 1 beta [Mus musculus (house mouse)]

Gene ID: 17288, updated on 13-Mar-2020

Summary

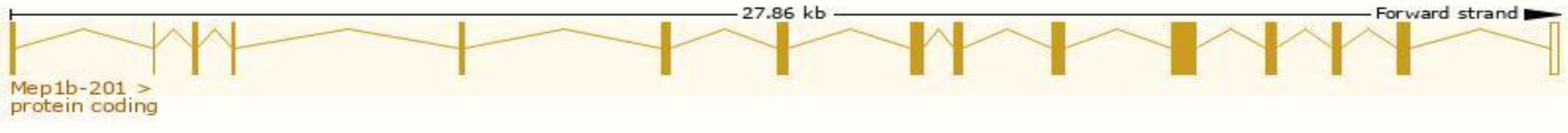
Official Symbol	Mep1b provided by MGI
Official Full Name	meprin 1 beta provided byMGI
Primary source	MGI:MGI:96964
See related	Ensembl:ENSMUSG00000024313
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Mep-1b
Expression	Biased expression in large intestine adult (RPKM 195.8), small intestine adult (RPKM 74.1) and 2 other tissuesSee more
Orthologs	human all

Transcript information（Ensembl）

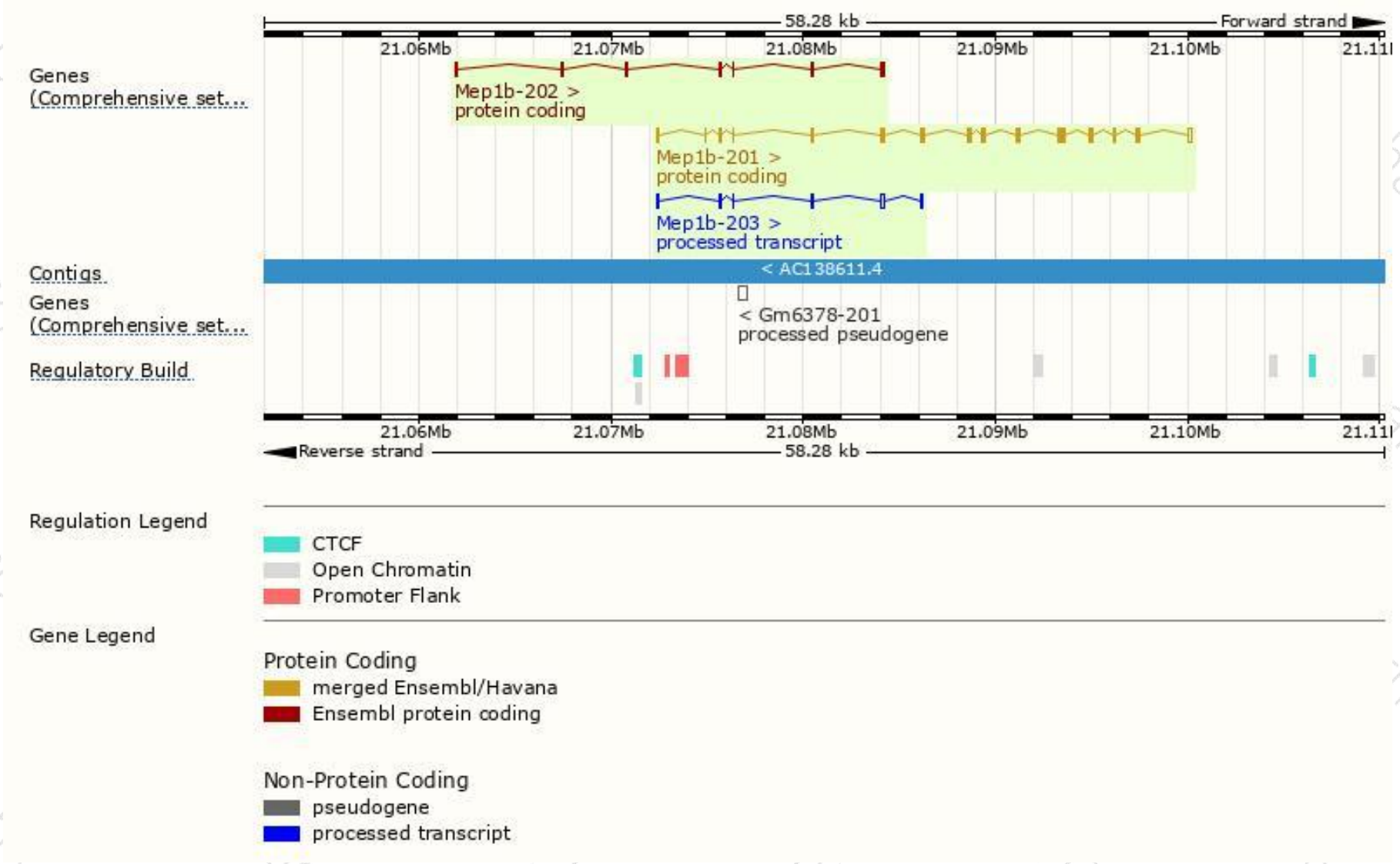
The gene has 3 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Mep1b-201	ENSMUST00000082235.4	2286	704aa	Protein coding	CCDS37747	Q61847	TSL:1 GENCODE basic APPRIS is a system to annotate alternatively spliced transcripts based on a range of computational methods to identify the most functionally important transcript(s) of a gene. APPRIS P1
Mep1b-202	ENSMUST00000234367.1	617	128aa	Protein coding	-	A0A3Q4EHC8	CDS 3' incomplete
Mep1b-203	ENSMUST00000235102.1	443	No protein	Processed transcript	-	-	

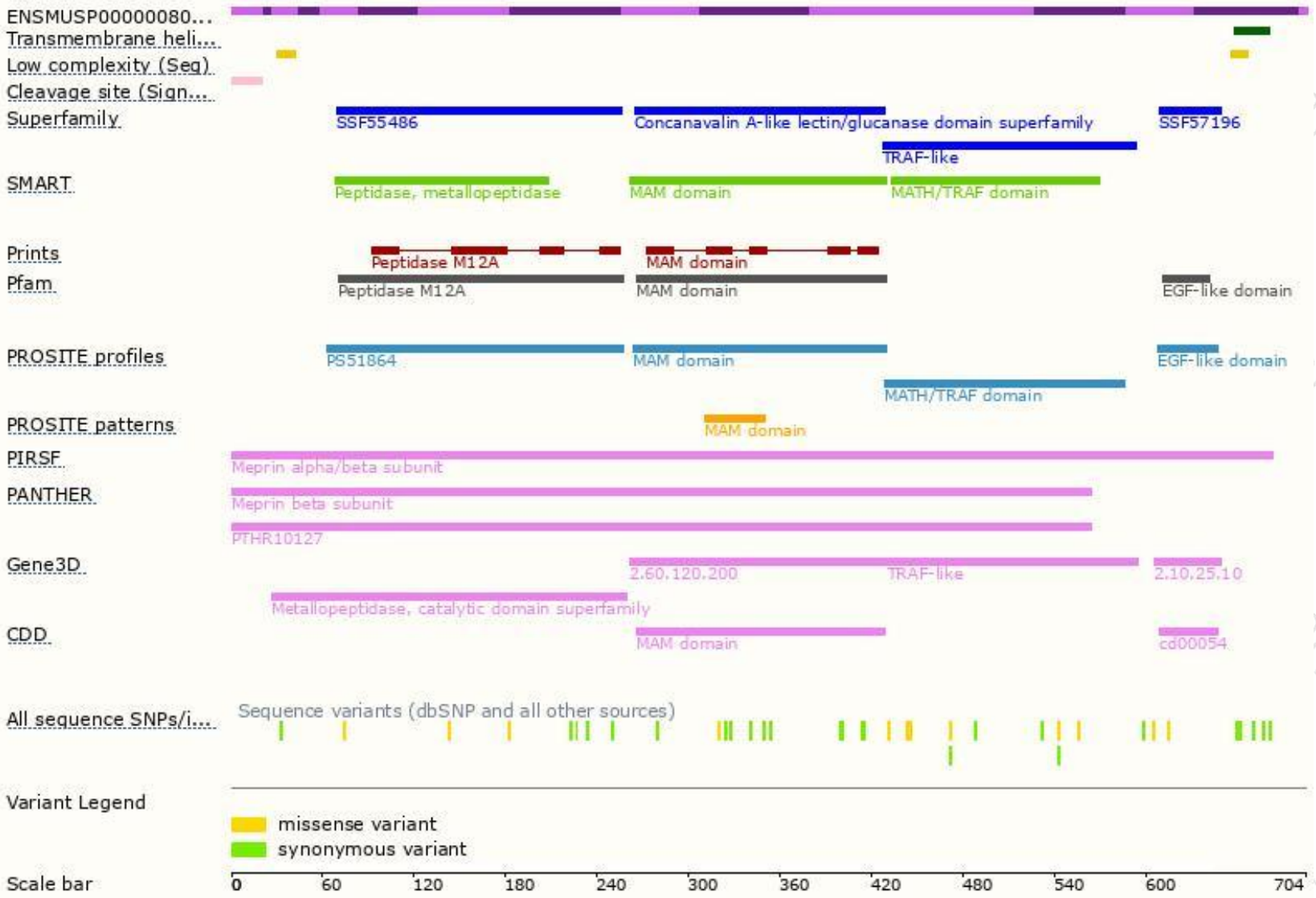
The strategy is based on the design of *Mep1b-201* transcript,the transcription is shown below:



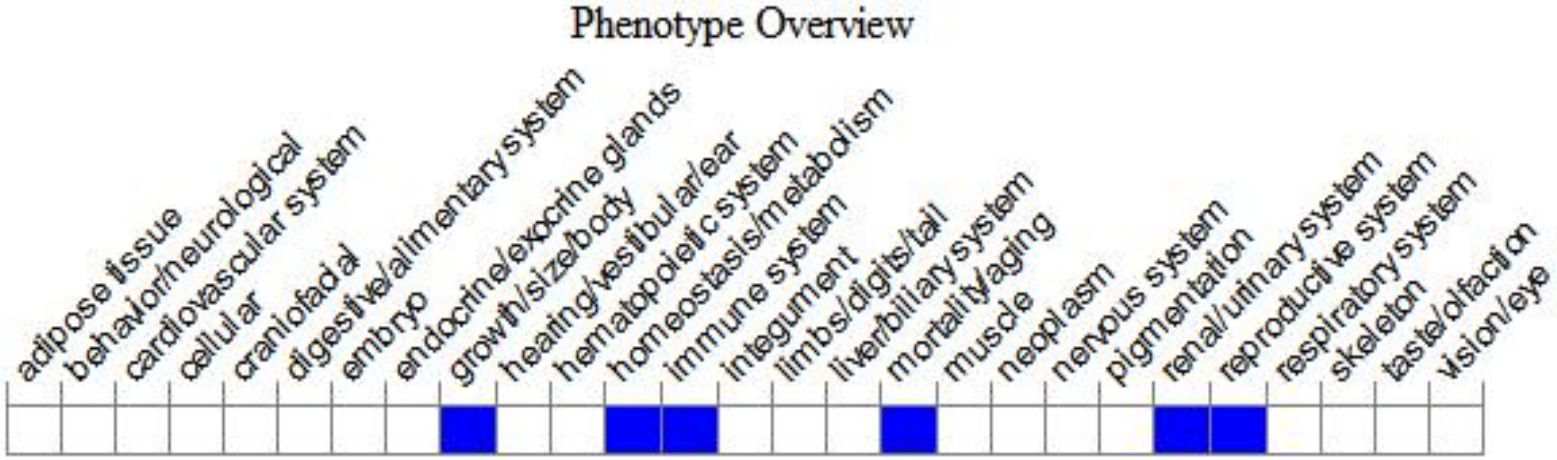
Genomic location distribution



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,homozygotes for a targeted null mutation exhibit 50% prenatal lethality; survivors have reduced birth weight and show altered renal gene expression, but otherwise are apparently normal.

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

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