Mmp9 Cas9-KO Strategy

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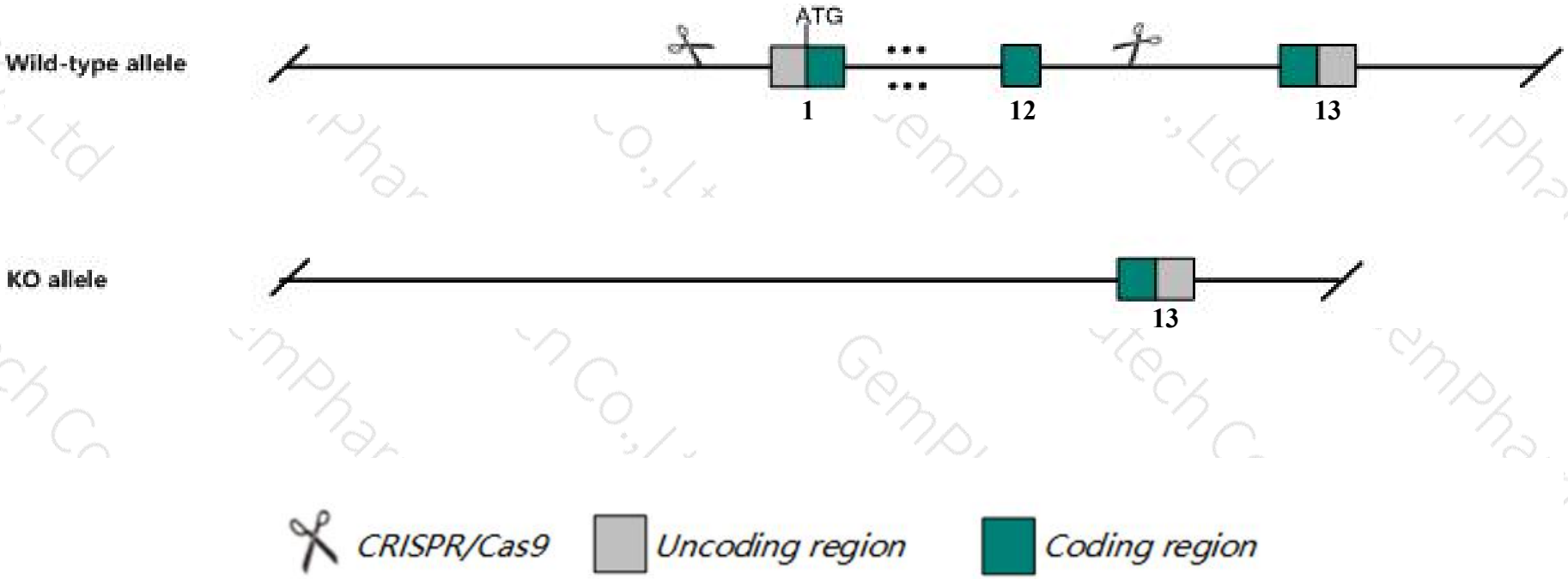
Project Overview

Project Name	***Mmp9***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Mmp9* gene. The schematic diagram is as follows:



Technical routes

➢ The *Mmp9* gene has 4 transcripts. According to the structure of *Mmp9* gene, exon1-exon12 of *Mmp9-201* (ENSMUST00000017881.2) transcript is recommended as the knockout region.The region contains start codon ATG. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Mmp9* gene. The brief process is as follows: CRISPR/Cas9 system

Notice

- According to the existing MGI data,Null mutants have short long bones with compensatory growth via delayed ossification and apoptosis of hypertrophic chondroctyes. Mutants are protected against ischemic brain injury, damage caused by myocardial infarction, and allergic airway inflammation.

- The *Mmp9* gene is located on the Chr2. 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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Mmp9 matrix metallopeptidase 9 [Mus musculus (house mouse)]

Gene ID: 17395, updated on 9-Apr-2019

Summary

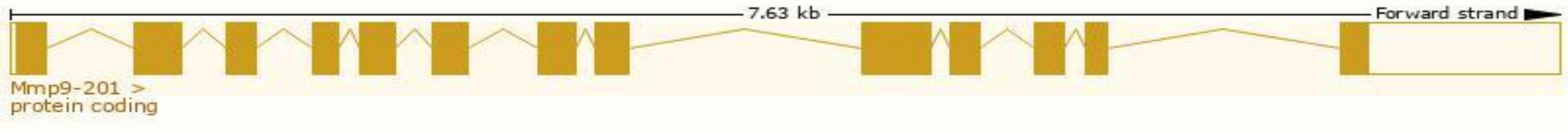
Official Symbol	Mmp9 provided by MGI
Official Full Name	matrix metallopeptidase 9 provided by MGI
Primary source	MGI:MGI:97011
See related	Ensembl:ENSMUSG00000017737
Gene type	protein coding
RefSeq status	REVIEWED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	AW743869, B/MMP9, Clg4b, Gel B, MMP-9, pro-MMP-9
Summary	This gene encodes a member of the matrix metalloproteinase family of extracellular matrix-degrading enzymes that are involved in tissue remodeling, wound repair, progression of atherosclerosis and tumor invasion. The encoded preproprotein undergoes proteolytic processing to generate a mature, zinc-dependent endopeptidase enzyme that degrades collagens of type IV, V and XI, and elastin. Mice lacking the encoded protein exhibit an abnormal pattern of skeletal growth plate vascularization and ossification, reduced keratinocyte hyperproliferation at all neoplastic stages, a decreased incidence of invasive tumors, and resistance to experimental autoimmune encephalomyelitis. [provided by RefSeq, Feb 2016]
Expression	Broad expression in liver E18 (RPKM 9.8), thymus adult (RPKM 8.9) and 21 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

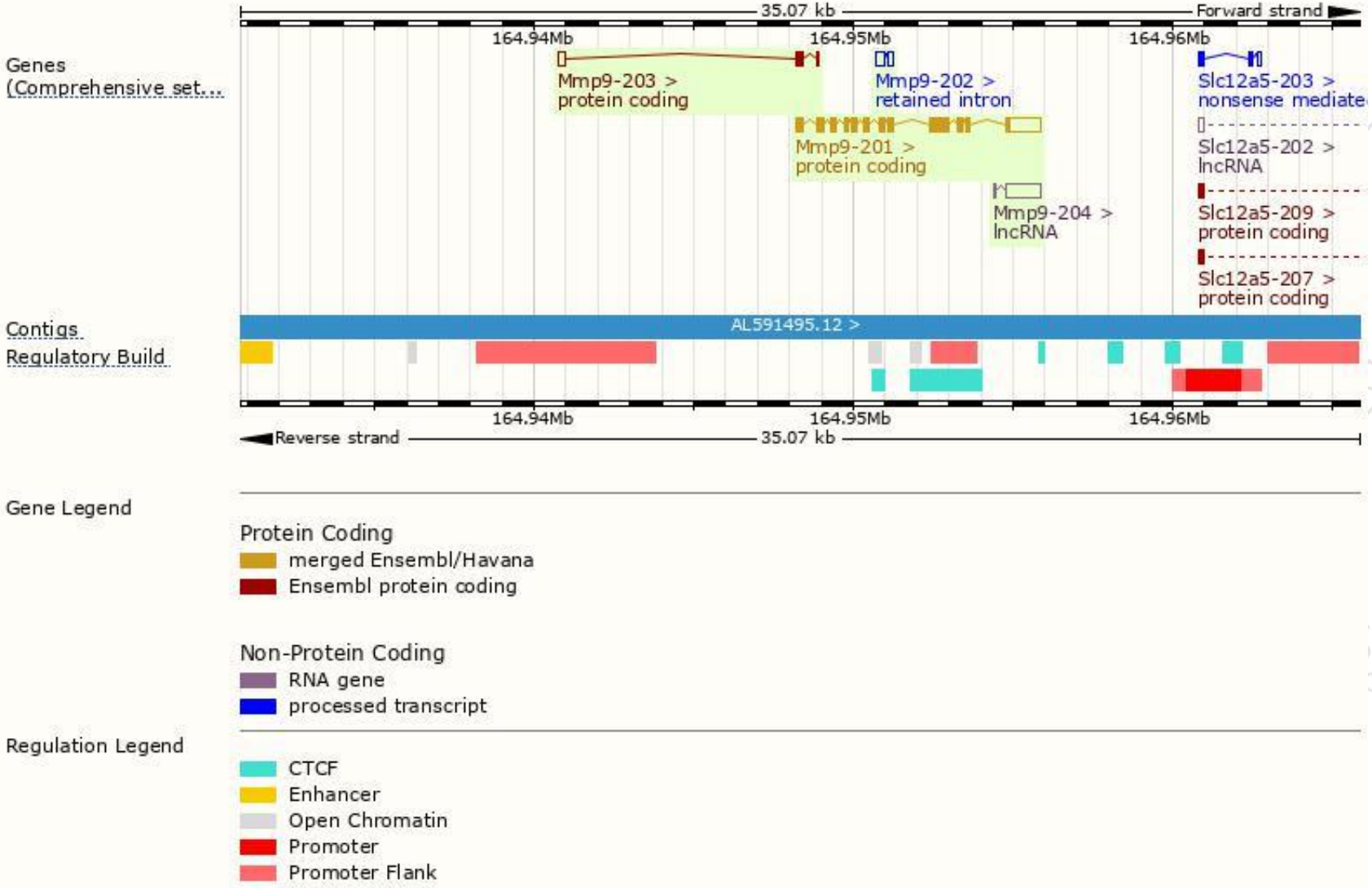
The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Mmp9-201	ENSMUST00000017881.2	3175	730aa	Protein coding	CCDS17066	P41245	TSL:1 GENCODE basic APPRIS P1
Mmp9-203	ENSMUST00000137626.1	416	67aa	Protein coding	-	A2A5K8	CDS 3' incomplete TSL:3
Mmp9-202	ENSMUST00000134382.1	462	No protein	Retained intron	-	-	TSL:2
Mmp9-204	ENSMUST00000144917.1	1125	No protein	lncRNA	-	-	TSL:2

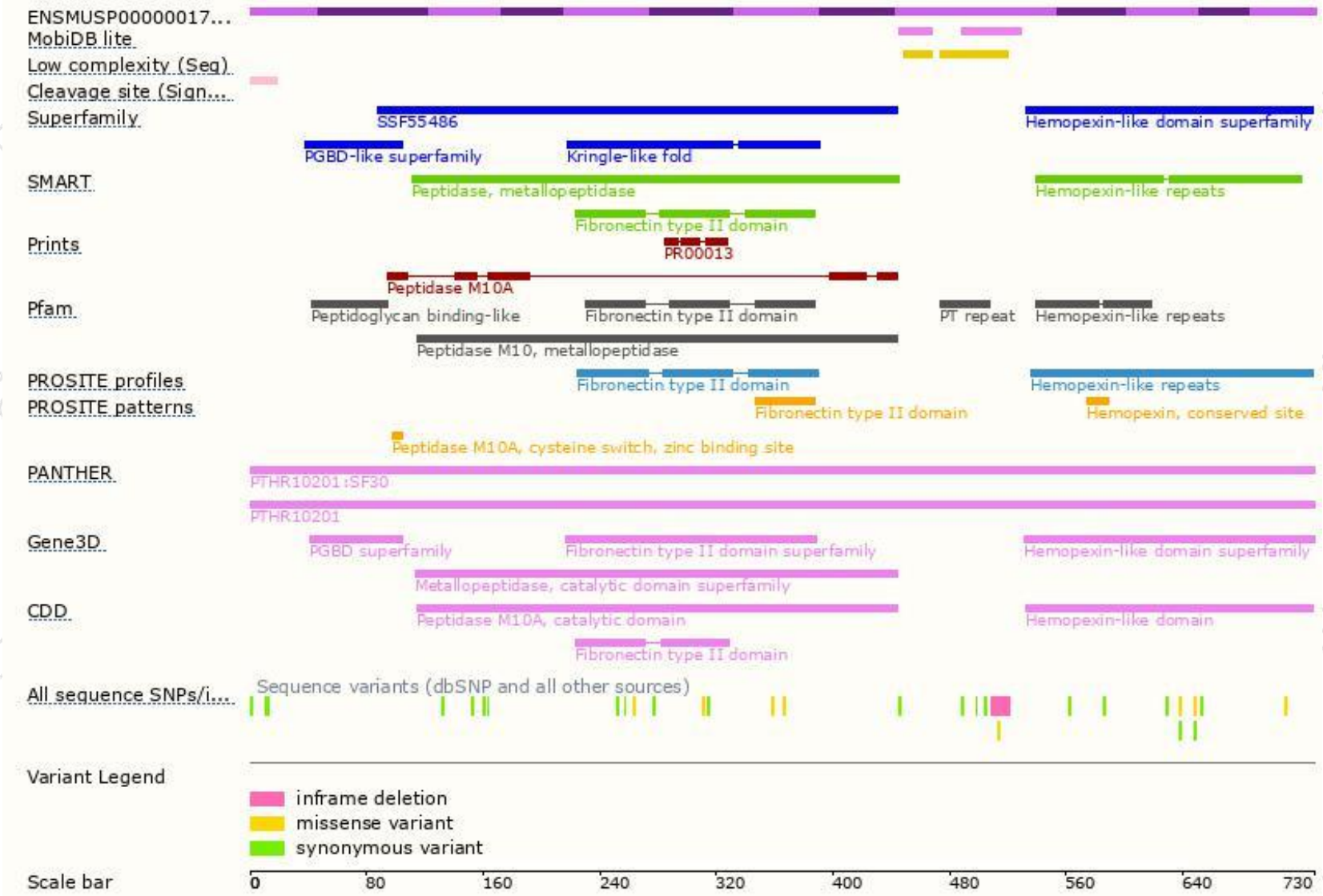
The strategy is based on the design of *Mmp9-201* transcript,The transcription is shown below



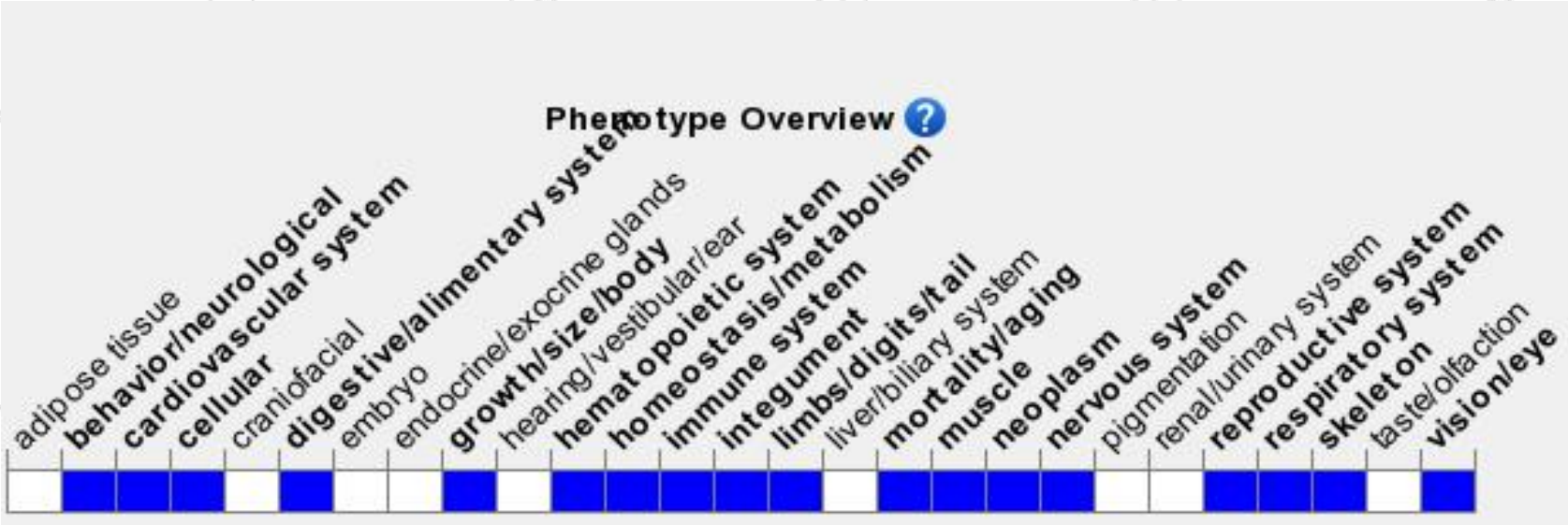
Genomic location distribution



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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