Adamts12 Cas9-CKO Strategy

Designer: Xueting Zhang
Reviewer:Yanhua Shen
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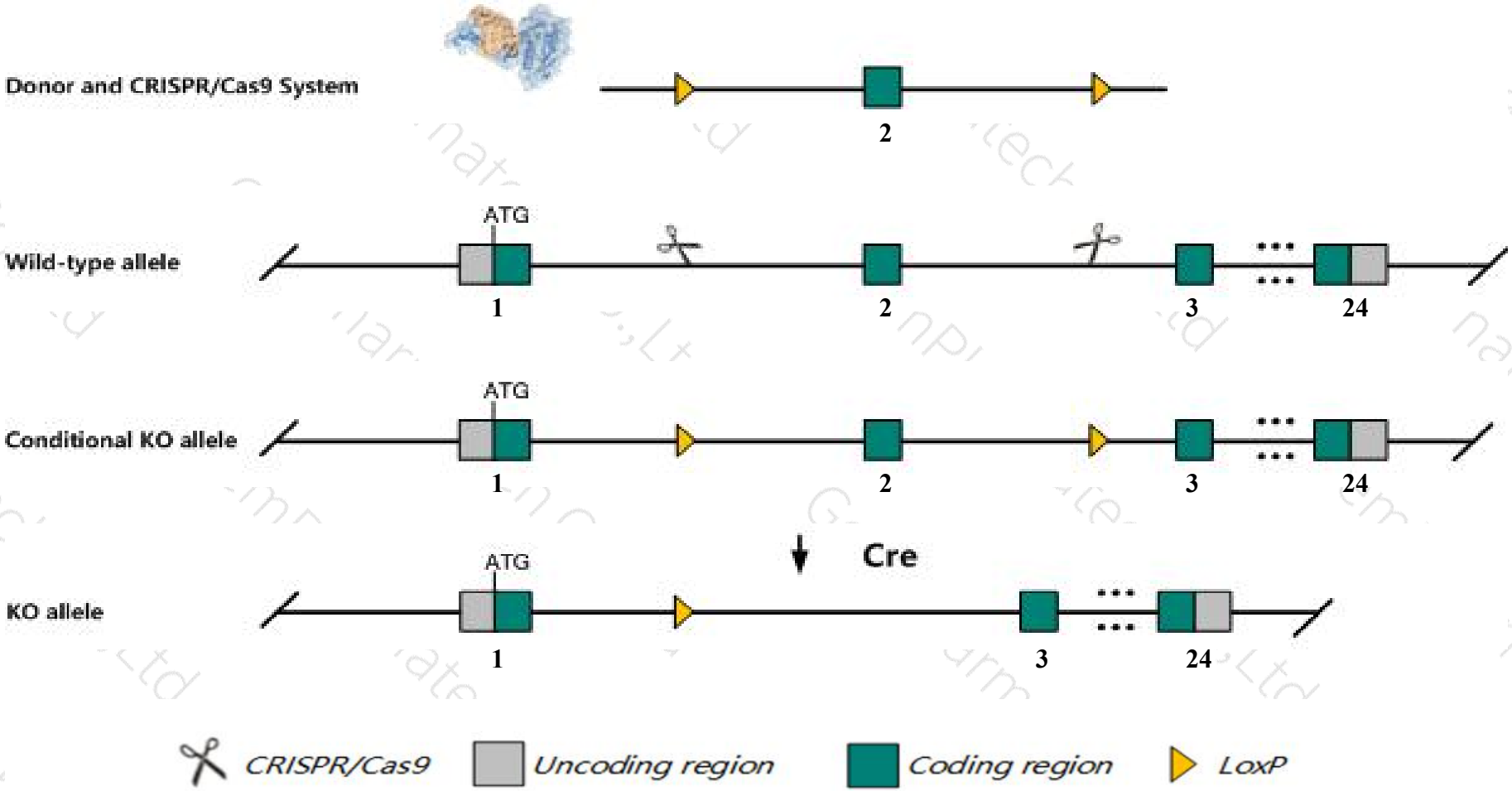
Project Overview

Project Name	***Adamts12***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Adamts12* gene. The schematic diagram is as follows:



Technical routes

- The *Adamts12* gene has 3 transcripts. According to the structure of *Adamts12* gene, exon2 of *Adamts12-201* (ENSMUST00000061318.8) transcript is recommended as the knockout region.The region contains 368bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Adamts12* gene. The brief process is as follows:CRISPR/Cas9 system 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 will be 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,Mice homozygous for a knock-out allele exhibit increased tumor vascularization, tumor invasion, and angiogenesis.

- The *Adamts12* gene is located on the Chr15. 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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Adamts12 a disintegrin-like and metallopeptidase (reprolysin type) with thrombospondin type 1 motif, 12 [*Mus musculus* (house mouse)]

Gene ID: 239337, updated on 30-Nov-2019

Summary

Official Symbol	Adamts12 provided by MGI
Official Full Name	a disintegrin-like and metallopeptidase (reprolysin type) with thrombospondin type 1 motif, 12 provided by MGI
Primary source	MGI:MGI:2146046
See related	Ensembl:ENSMUSG00000047497
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	AI605170; ADAMTS-12
Summary	This gene encodes a member of "a disintegrin and metalloproteinase with thrombospondin motifs" (ADAMTS) family of multi-domain matrix-associated metalloendopeptidases that have diverse roles in tissue morphogenesis and pathophysiological remodeling, in inflammation and in vascular biology. The encoded preproprotein undergoes proteolytic processing to generate an active protease. Mice lacking the encoded protein exhibit increased angiogenic response and tumor invasion in different models of angiogenesis and, severe inflammation and delayed recovery when subjected to experimental conditions that induce colitis, endotoxic sepsis and pancreatitis. [provided by RefSeq, Jul 2016]
Expression	Biased expression in mammary gland adult (RPKM 5.1), subcutaneous fat pad adult (RPKM 4.1) and 12 other tissues See more
Orthologs	human all

Genomic context

Location: 15; 15 A1

See Adamts12 in Genome Data Viewer

Exon count: 24

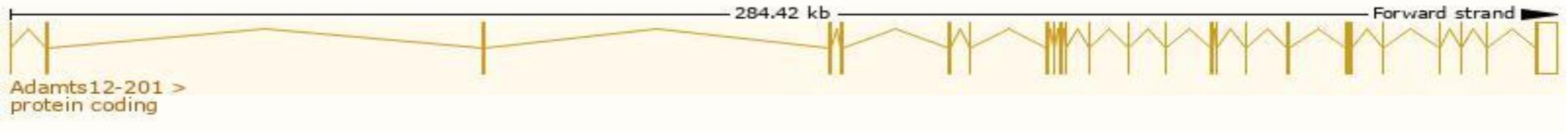
Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	15	NC_000081.6 (11064773..11349232)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	15	NC_000081.5 (10994545..11276622)

Transcript information（Ensembl）

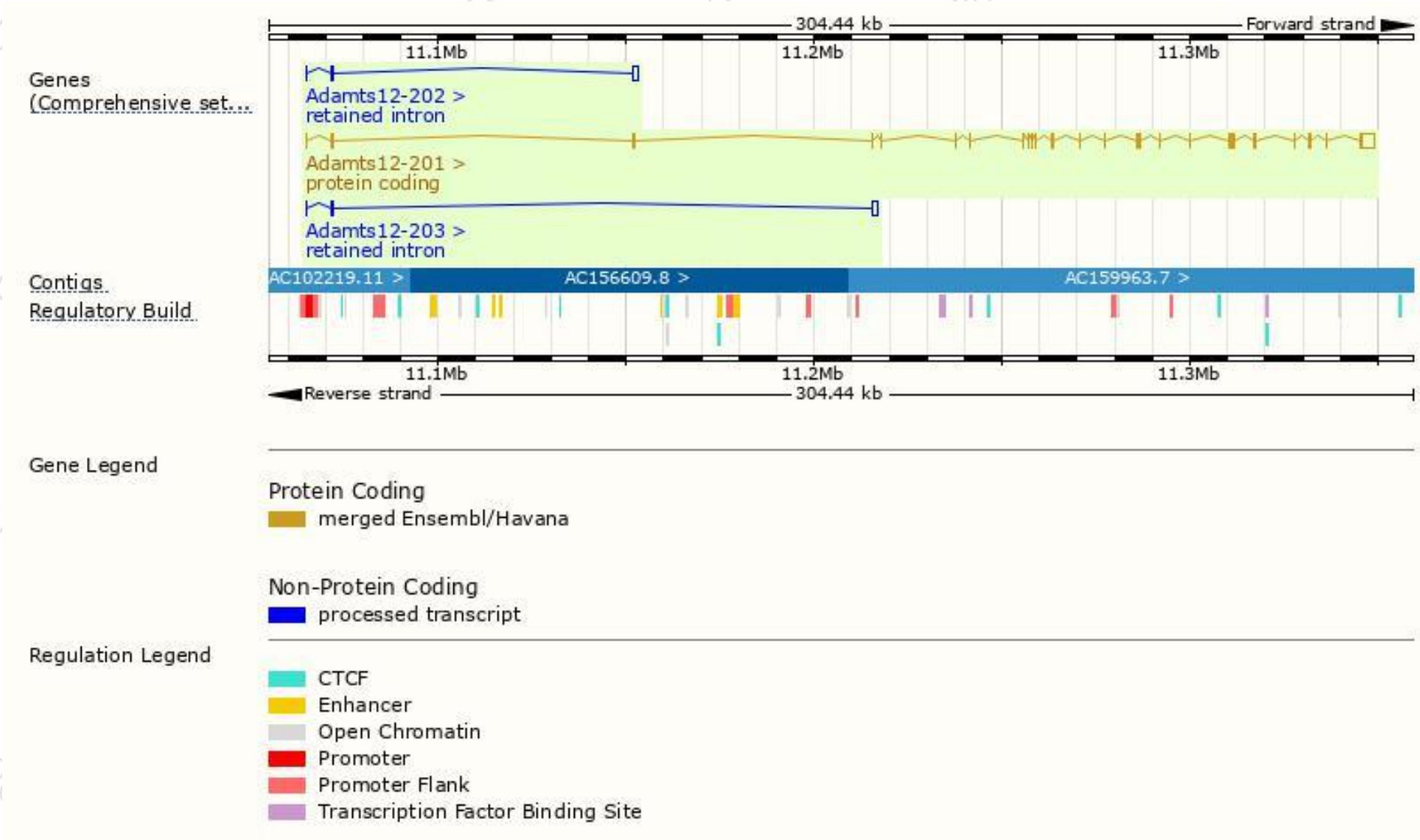
The gene has 3 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Adamts12-201	ENSMUST00000061318.8	8579	1600aa	Protein coding	CCDS27384	Q811B3	TSL:1 GENCODE basic APPRIS P1
Adamts12-203	ENSMUST00000228940.1	2289	No protein	Retained intron	-	-	
Adamts12-202	ENSMUST00000227189.1	1826	No protein	Retained intron	-	-	

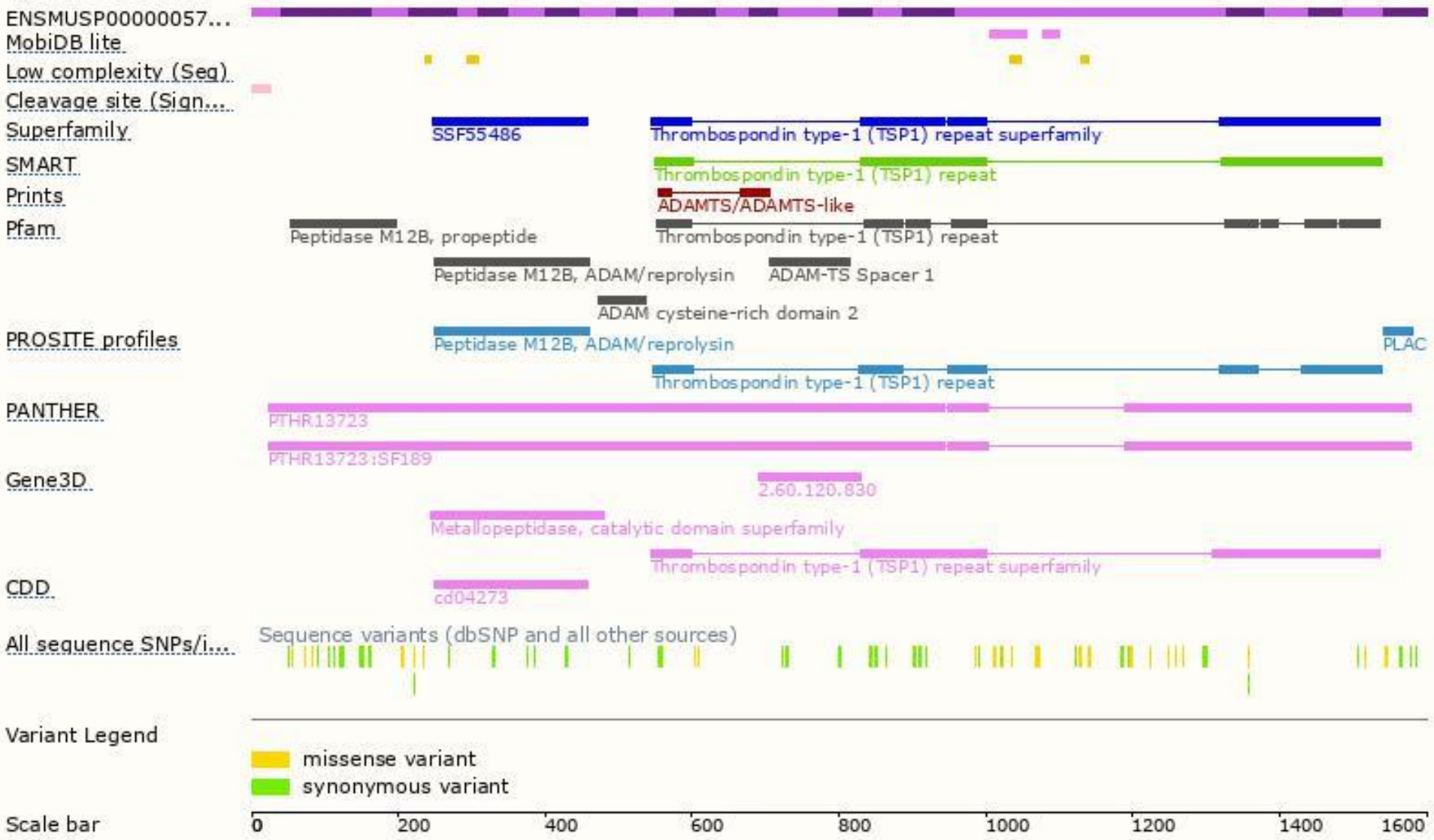
The strategy is based on the design of *Adamts12-201* transcript,The transcription is shown below



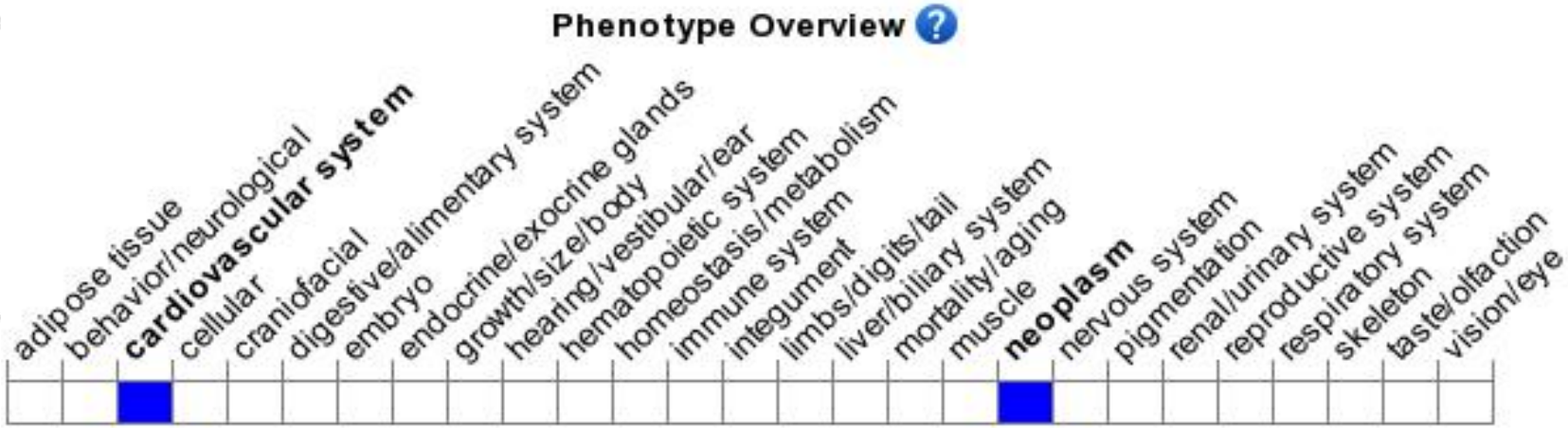
Genomic location distribution



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,Mice homozygous for a knock-out allele exhibit increased tumor vascularization, tumor invasion, and angiogenesis.

集萃药康
GemPharmatech

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

Tel: 400-9660890

集萃药康生物科技
GemPharmatech Co.,Ltd