Adamts1 Cas9-CKO Strategy

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Project Overview

Project Name	***Adamts1***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

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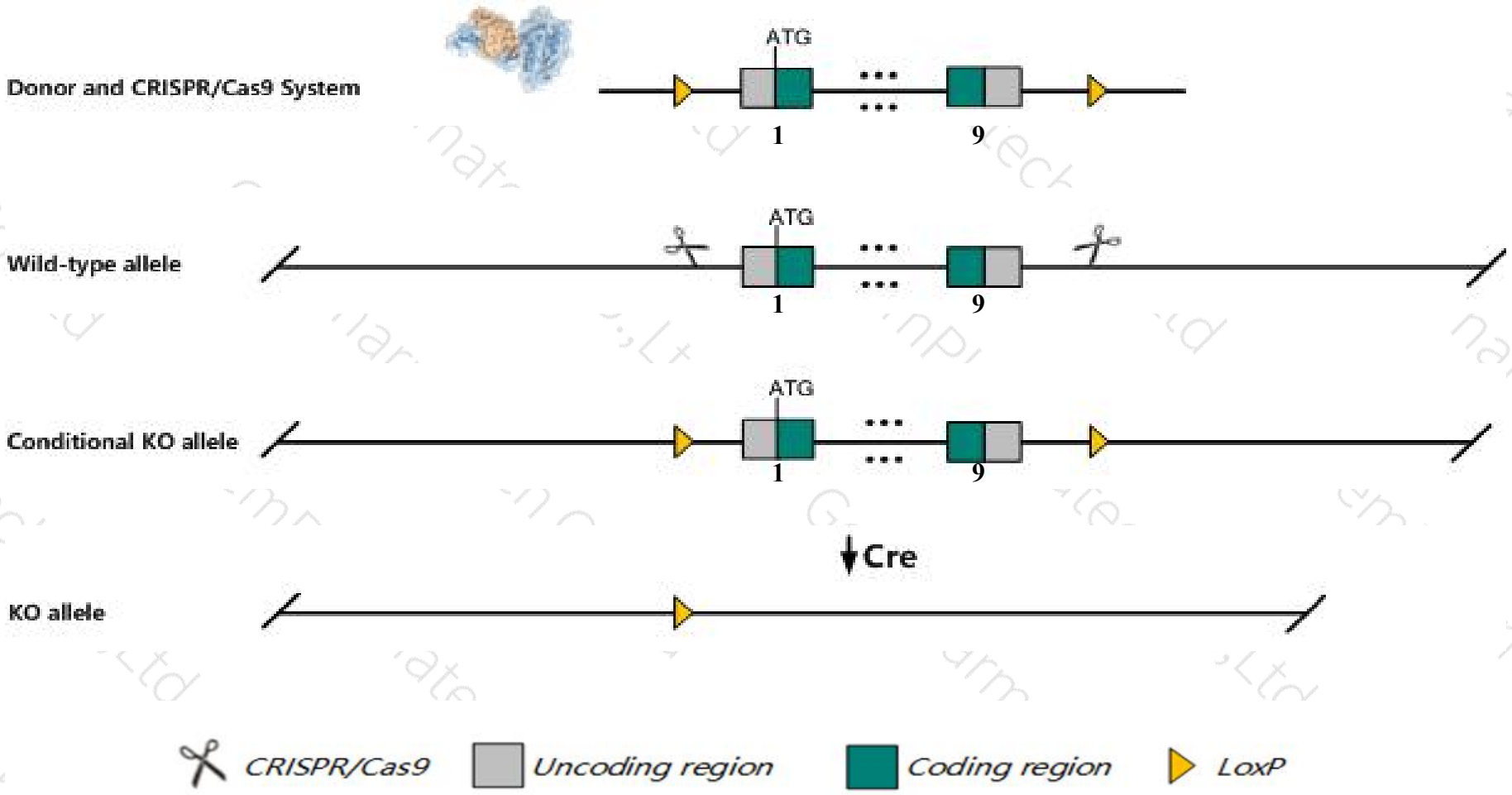
This model will use CRISPR/Cas9 technology to edit the *Adamts1* gene. The schematic diagram is as follows:



Technical routes

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- The *Adamts1* gene has 3 transcripts. According to the structure of *Adamts1* gene, exon1-exon9 of *Adamts1-201* (ENSMUST00000023610.14) transcript is recommended as the knockout region.The region contains all of the coding sequence.Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Adamts1* 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 targeted mutations that inactivate the gene display growth retardation with adipose tissue malformation, impaired female fertility, enlarged renal calices and abnormal adrenal medullary architecture.

- The *Adamts1* gene is located on the Chr16. 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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Adamts1 a disintegrin-like and metallopeptidase (reprolysin type) with thrombospondin type 1 motif, 1 [*Mus musculus* (house mouse)]

Gene ID: 11504, updated on 26-Oct-2019

Summary

Official Symbol	Adamts1 provided by MGI
Official Full Name	a disintegrin-like and metallopeptidase (reprolysin type) with thrombospondin type 1 motif, 1 provided by MGI
Primary source	MGI:MGI:109249
See related	Ensembl:ENSMUSG00000022893
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	C3-C5; METH1; ADAMTS; METH-1; ADAM-TS1; ADAMTS-1
Summary	This gene encodes a member of the ADAMTS (a disintegrin and metalloproteinase with thrombospondin motif) family and preproprotein that is proteolytically processed to generate a mature protein product. This secreted protein product plays an important role in ovulation, likely through its cleavage of the extracellular matrix component versican. The encoded protein may enhance tumorigenesis in a mouse model of breast cancer. Homozygous knockout mice for this gene exhibit enhanced perinatal lethality, impaired growth and adipose tissue development, and impaired ovulation in females. [provided by RefSeq, Oct 2015]
Expression	Broad expression in lung adult (RPKM 22.1), subcutaneous fat pad adult (RPKM 15.6) and 23 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

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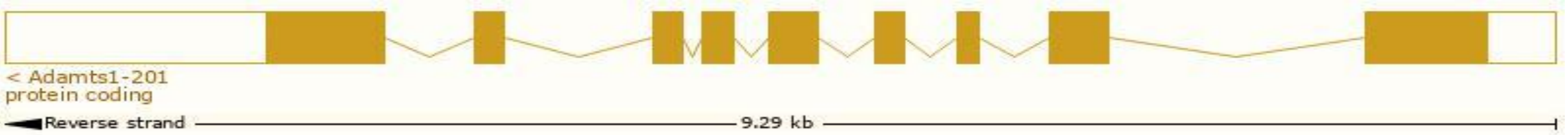
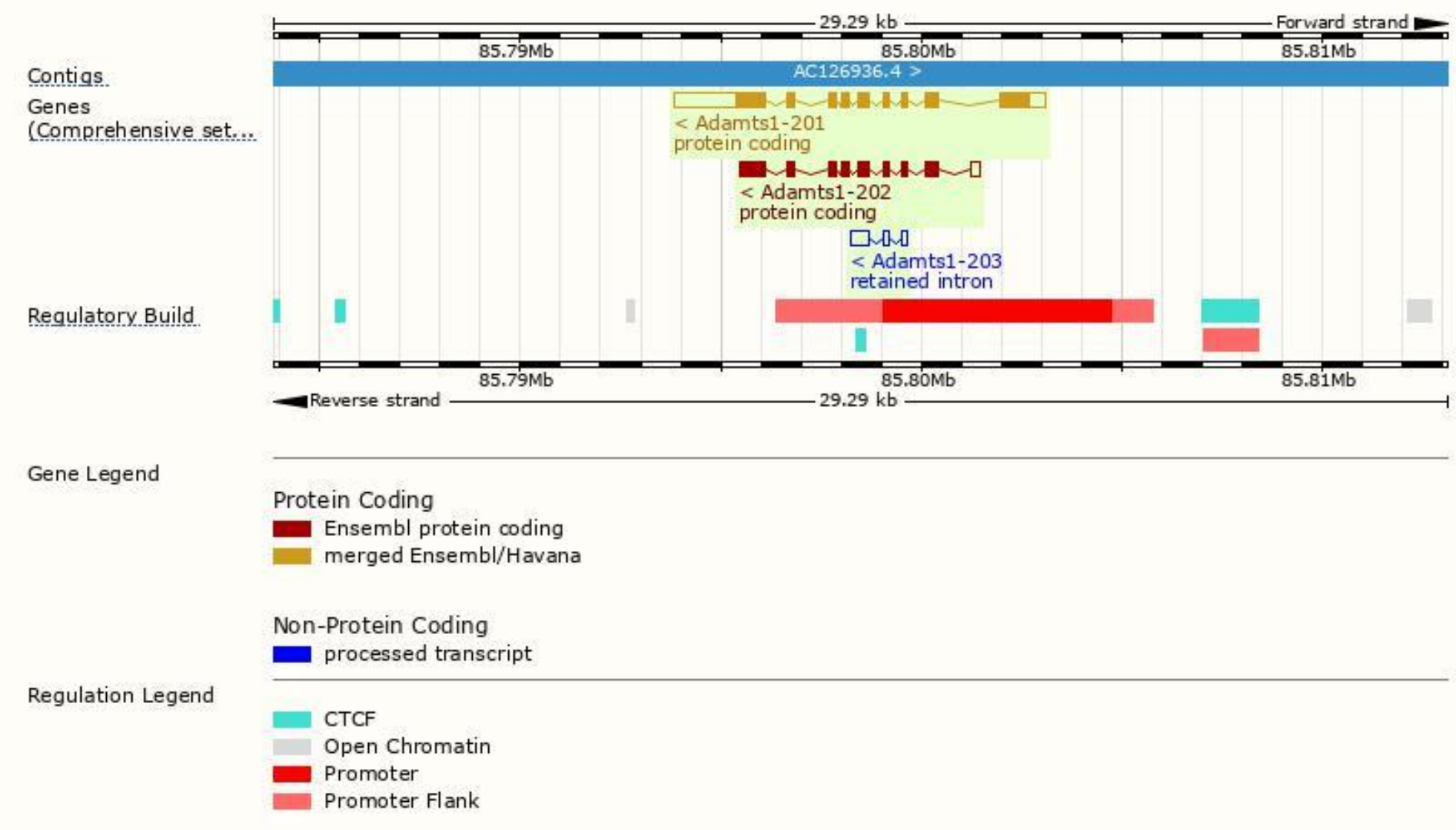
The gene has 3 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Adamts1-201	ENSMUST00000023610.14	4884	968aa	Protein coding	CCDS28287	P97857	TSL:1 GENCODE basic APPRIS P1
Adamts1-202	ENSMUST00000125897.1	2338	681aa	Protein coding	-	E9PY08	CDS 3' incomplete TSL:1
Adamts1-203	ENSMUST00000138474.1	737	No protein	Retained intron	-	-	TSL:3

The strategy is based on the design of *Adamts1-201* transcript,The transcription is shown below

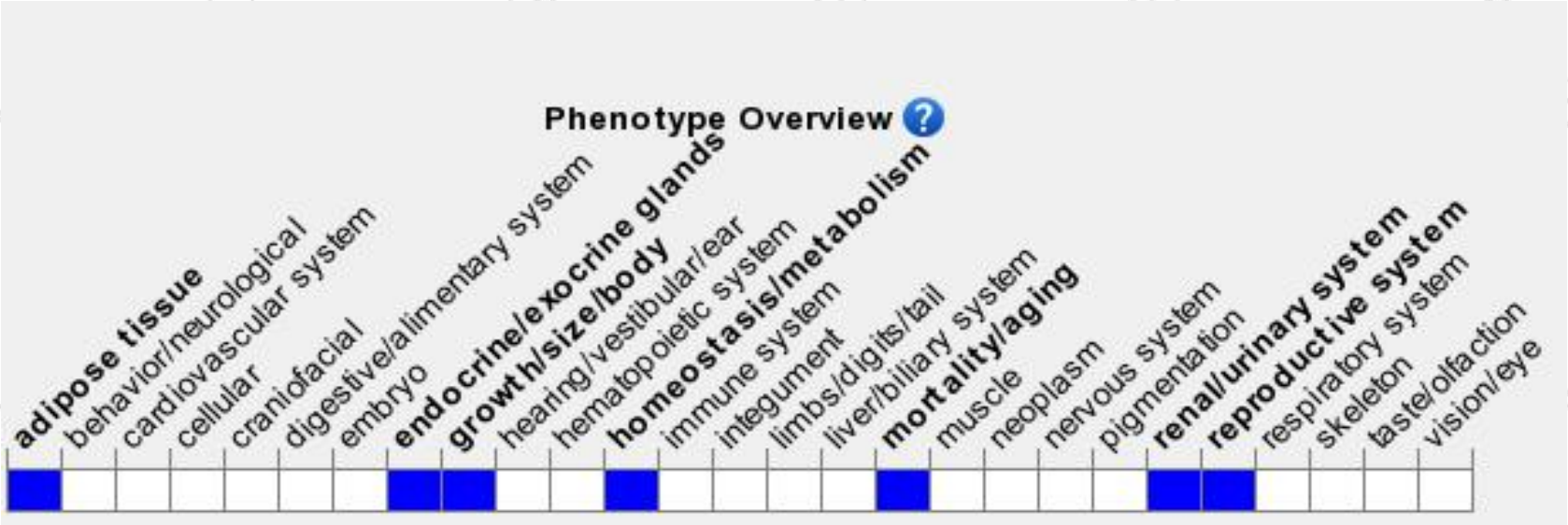


Genomic location distribution



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 targeted mutations that inactivate the gene display growth retardation with adipose tissue malformation, impaired female fertility, enlarged renal calices and abnormal adrenal medullary architecture.

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