

***Arsb* Cas9-KO Strategy**

Designer:	Jing Jin
Reviewer:	Yang Zeng
Design Date:	2019-11-16

Project Overview

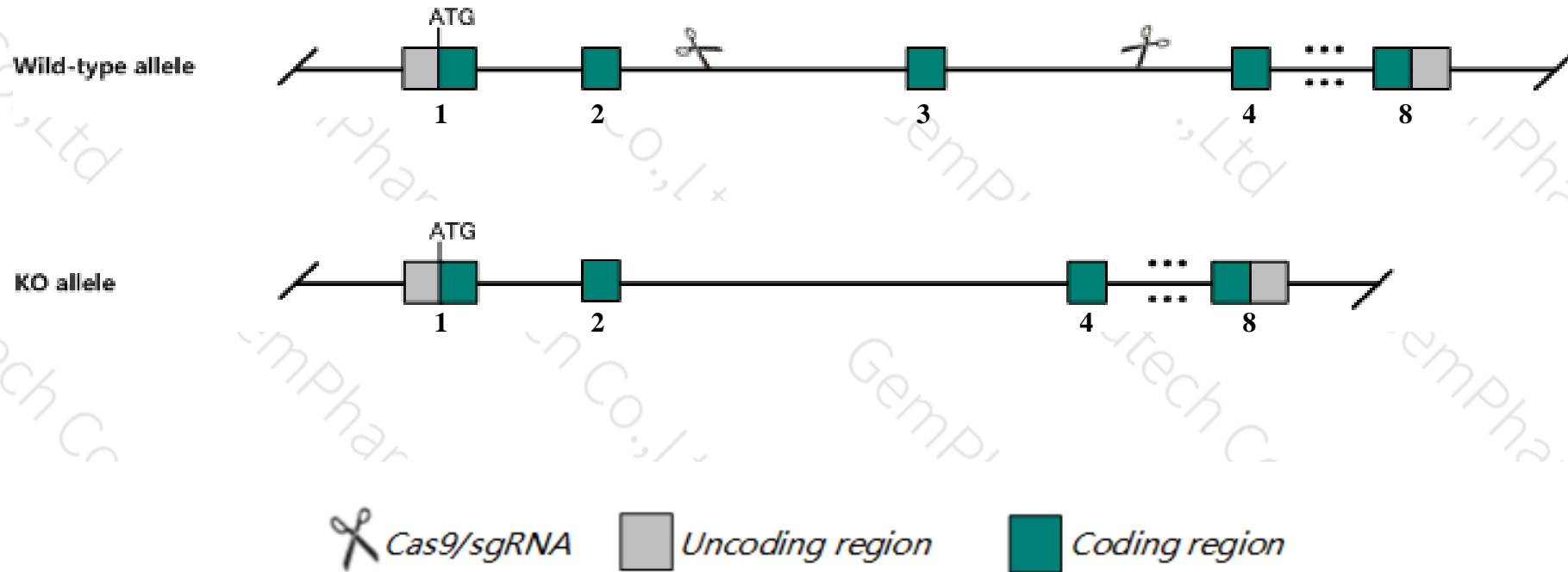
Project Name	<i>Arsb</i>
---------------------	--------------------

Project type	Cas9-KO
---------------------	----------------

Strain background	C57BL/6JGpt
--------------------------	--------------------

Knockout strategy

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



- The *Arsb* gene has 2 transcripts. According to the structure of *Arsb* gene, exon3 of *Arsb-201* (ENSMUST00000091403.5) transcript is recommended as the knockout region. The region contains 191bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Arsb* gene. The brief process is as follows: sgRNA was transcribed in vitro. Cas9 and sgRNA 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.

- According to the existing MGI data, Homozygous mutation of this gene results in development of shortened limbs and snout and a broadened head after 4 weeks of age. Mutant animals have elevated concentrations of glucosaminoglycans in the urine and irregular cartilage structure.
- The KO region is close to *Mir5624* gene. Knockout the region may affect the function of *Mir5624* gene.
- The *Arsb* gene is located on the Chr13. 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.

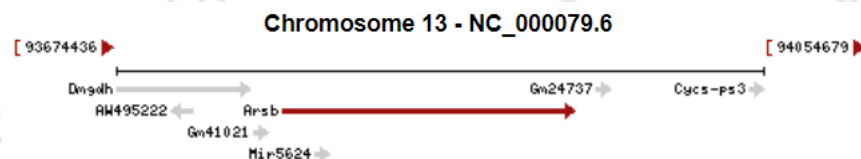
Gene information (NCBI)

Arsb arylsulfatase B [*Mus musculus* (house mouse)]

Gene ID: 11881, updated on 5-Nov-2019

Summary

Official Symbol	Arsb provided by MGI
Official Full Name	arylsulfatase B provided by MGI
Primary source	MGI:MGI:88075
See related	Ensembl:ENSMUSG00000042082
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	As1; As-1; As-1r; As-1s; As-1t; As1-r; As1-s; As1-t; Asr-1; Ast-1; AI480648; 1110007C02Rik
Expression	Ubiquitous expression in kidney adult (RPKM 45.3), ovary adult (RPKM 25.9) and 28 other tissues See more
Orthologs	human all

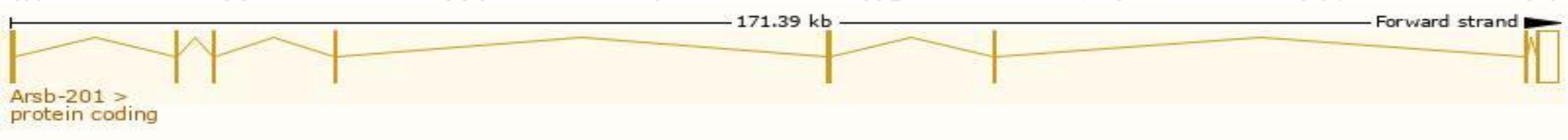


Transcript information (Ensembl)

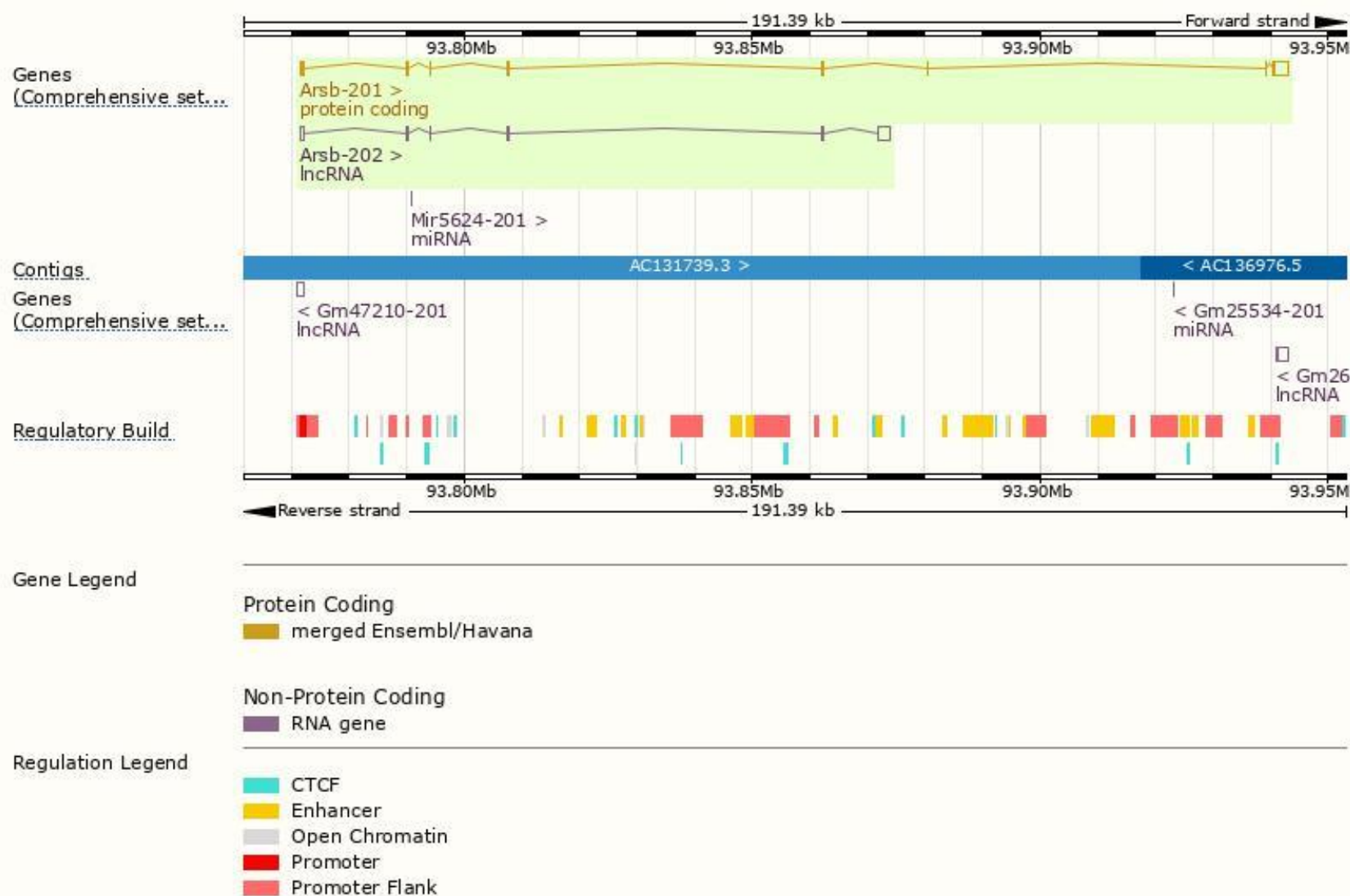
The gene has 2 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Translation ID	Biotype	CCDS	UniProt	Flags
Arsb-201	ENSMUST00000091403.5	4038	534aa	ENSMUSP00000088964.4	Protein coding	CCDS36749	A0A0R4J138	TSL:1 Gencode basic APPRIS P1
Arsb-202	ENSMUST00000220652.1	3226	No protein	-	lncRNA	-	-	TSL:1

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



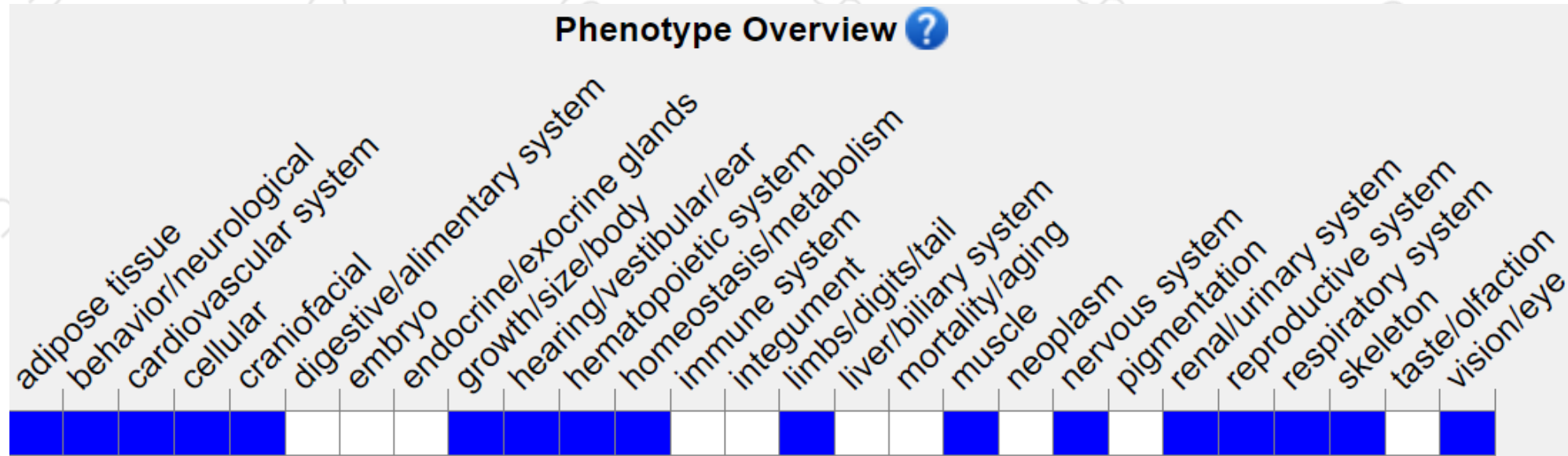
Genomic location distribution



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, Homozygous mutation of this gene results in development of shortened limbs and snout and a broadened head after 4 weeks of age. Mutant animals have elevated concentrations of glucosaminoglycans in the urine and irregular cartilage structure.

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

Tel: 025-5864 1534

