

# *Actn1* Cas9-KO Strategy

<b>Designer:</b>	<b>Yang Zeng</b>
<b>Reviewer:</b>	
<b>Design Date:</b>	<b>2019-11-26</b>

# Project Overview

---

**Project Name**

*Actn1*

---

**Project type**

**Cas9-KO**

---

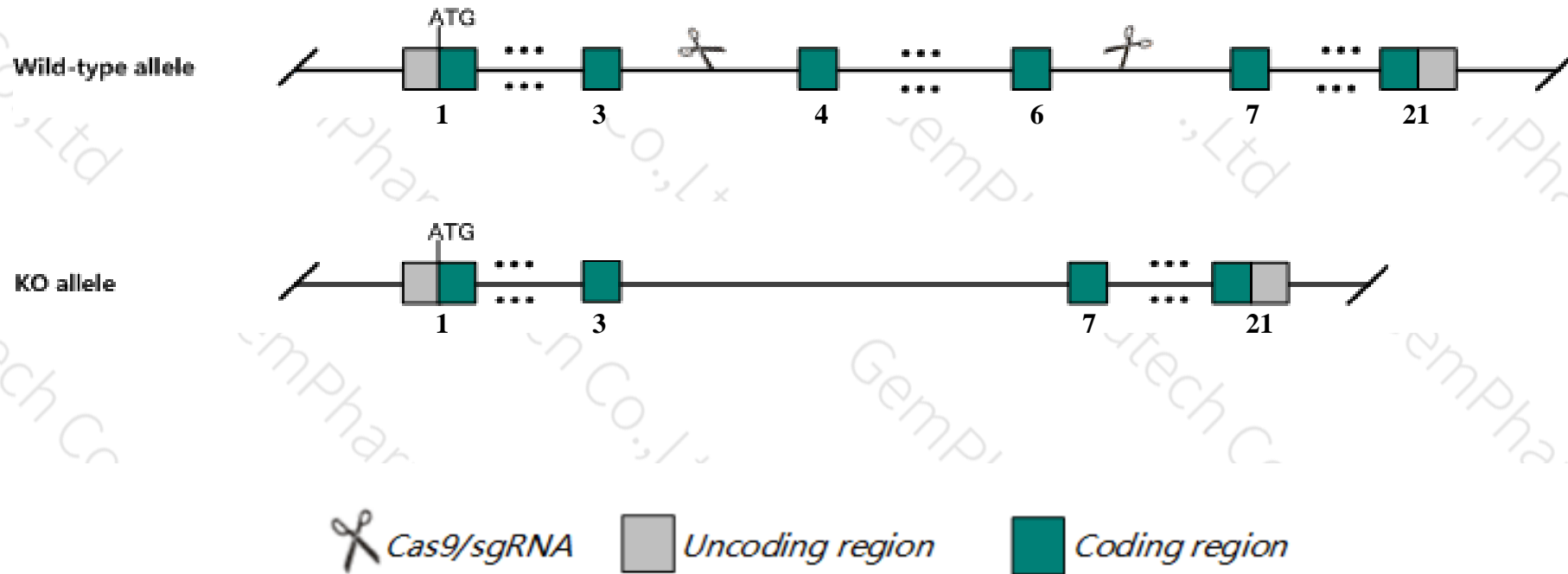
**Strain background**

**C57BL/6JGpt**

---

# Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Actn1* gene. The schematic diagram is as follows:



- The *Actn1* gene has 7 transcripts. According to the structure of *Actn1* gene, exon4-exon6 of *Actn1-201* (ENSMUST00000021554.15) transcript is recommended as the knockout region. The region contains 254bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Actn1* 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.

- The KO region is close to *Gm47765* gene. Knockout the region may affect the function of *Gm47765* gene.
- The *Actn1* gene is located on the Chr12. 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.

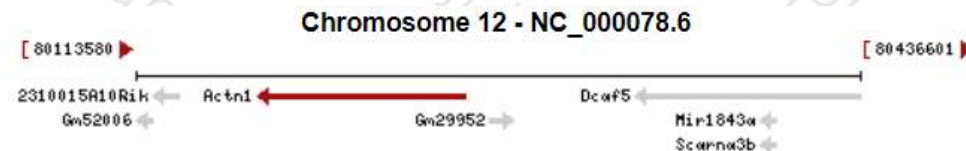
# Gene information (NCBI)

## Actn1 actinin, alpha 1 [ *Mus musculus* (house mouse) ]

Gene ID: 109711, updated on 28-Oct-2019

### Summary

<b>Official Symbol</b>	Actn1 provided by <a href="#">MGI</a>
<b>Official Full Name</b>	actinin, alpha 1 provided by <a href="#">MGI</a>
<b>Primary source</b>	<a href="#">MGI:MGI:2137706</a>
<b>See related</b>	<a href="#">Ensembl:ENSMUSG00000015143</a>
<b>Gene type</b>	protein coding
<b>RefSeq status</b>	VALIDATED
<b>Organism</b>	<a href="#">Mus musculus</a>
<b>Lineage</b>	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
<b>Also known as</b>	Actn1a; 3110023F10Rik
<b>Expression</b>	Broad expression in bladder adult (RPKM 126.9), ovary adult (RPKM 50.7) and 22 other tissues <a href="#">See more</a>
<b>Orthologs</b>	<a href="#">human</a> <a href="#">all</a>



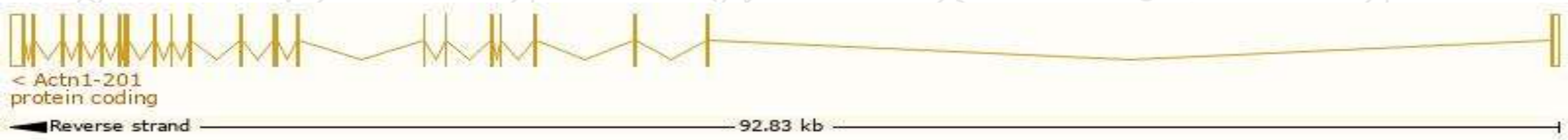


# Transcript information (Ensembl)

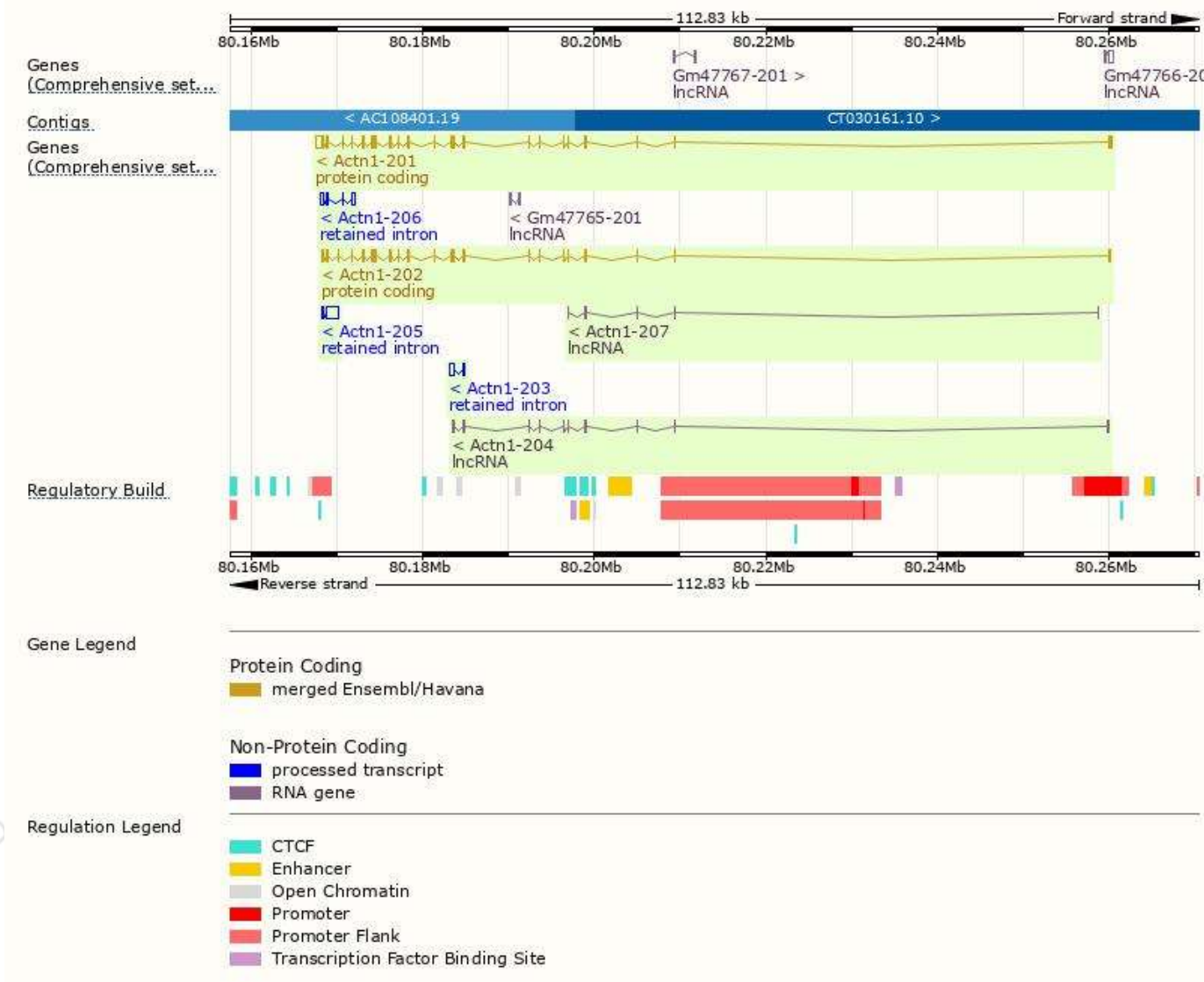
The gene has 7 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Actn1-201	<a href="#">ENSMUST00000021554.15</a>	3734	<a href="#">892aa</a>	Protein coding	<a href="#">CCDS26011</a>	<a href="#">Q7TPR4</a>	TSL:1 GENCODE basic APPRIS P1
Actn1-202	<a href="#">ENSMUST00000167327.1</a>	2664	<a href="#">887aa</a>	Protein coding	<a href="#">CCDS83972</a>	<a href="#">A1BN54</a>	TSL:1 GENCODE basic
Actn1-205	<a href="#">ENSMUST00000219382.1</a>	1410	No protein	Retained intron	-	-	TSL:1
Actn1-206	<a href="#">ENSMUST00000219634.1</a>	1034	No protein	Retained intron	-	-	TSL:1
Actn1-203	<a href="#">ENSMUST00000217984.1</a>	449	No protein	Retained intron	-	-	TSL:3
Actn1-204	<a href="#">ENSMUST00000218874.1</a>	943	No protein	lncRNA	-	-	TSL:5
Actn1-207	<a href="#">ENSMUST00000220351.1</a>	505	No protein	lncRNA	-	-	TSL:3

The strategy is based on the design of *Actn1-201* transcript,The transcription is shown below

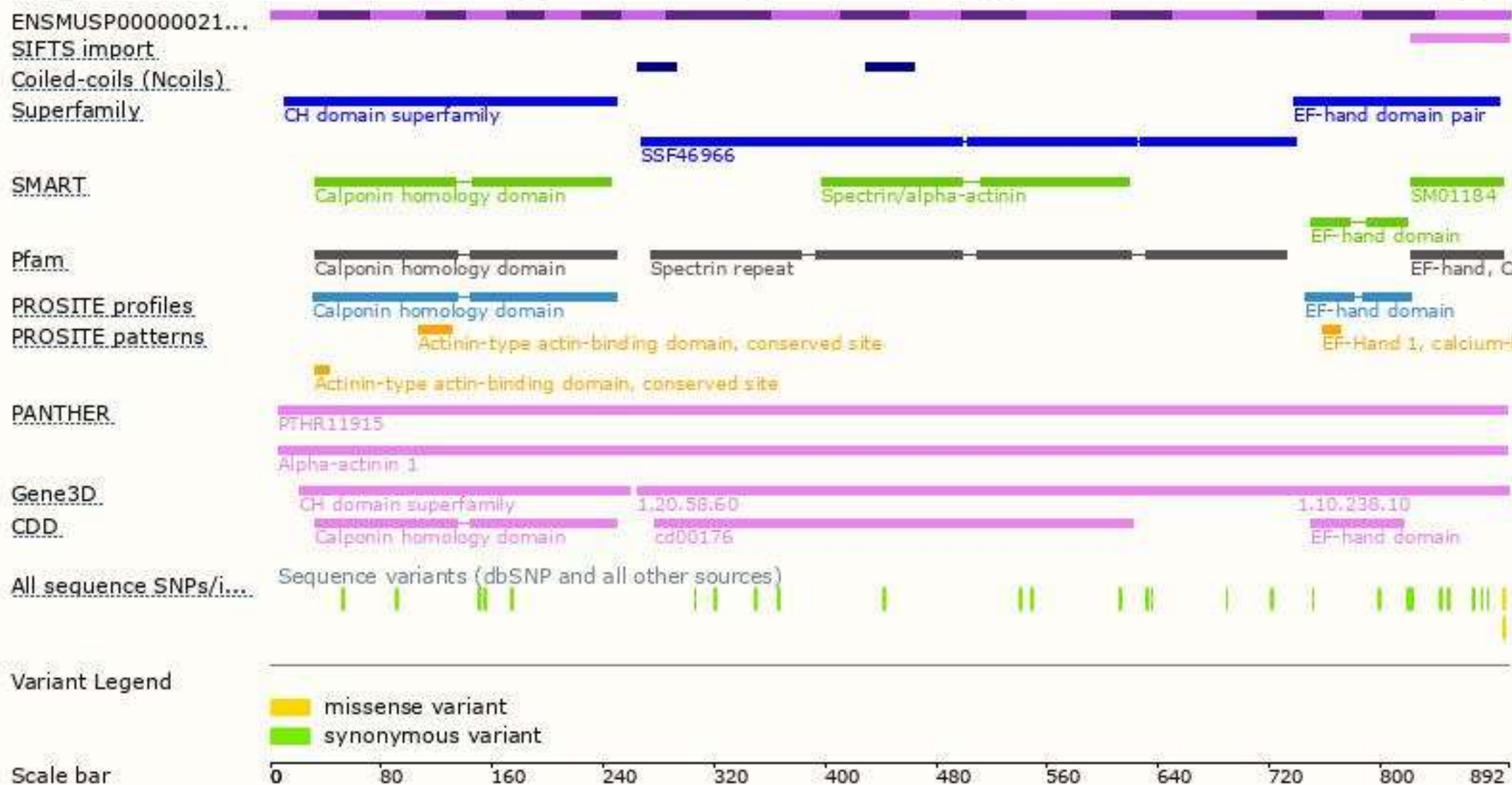


# Genomic location distribution





# Protein domain



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

Tel: 025-5864 1534

