

# *Arpc3* Cas9-KO Strategy

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# Project Overview

**Project Name**

*Arpc3*

**Project type**

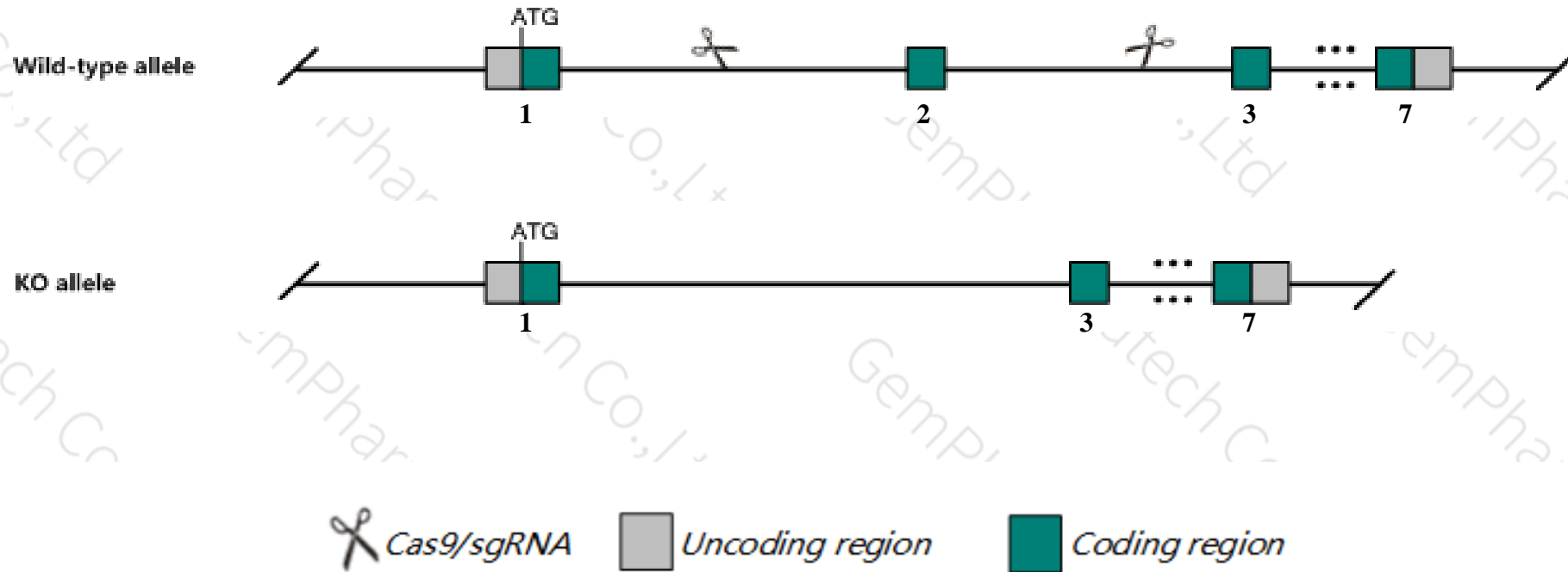
**Cas9-KO**

**Strain background**

**C57BL/6JGpt**

# Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Arpc3* gene. The schematic diagram is as follows:



- The *Arpc3* gene has 8 transcripts. According to the structure of *Arpc3* gene, exon2 of *Arpc3*-202 (ENSMUST00000102525.10) transcript is recommended as the knockout region. The region contains 100bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Arpc3* 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, Mice homozygous for a transposon-induced allele develop only to the blastocyst stage and show defects in trophoblast outgrowth and in the dynamics of actin accumulation. Mice heterozygous for the same transposon-induced allele and a knock-out allele show impaired trophoblast outgrowth activity.
- Transcript *Arpc3*-203/204/205 may not be affected.
- The *Arpc3* gene is located on the Chr5. 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)

## Arpc3 actin related protein 2/3 complex, subunit 3 [ *Mus musculus* (house mouse) ]

Gene ID: 56378, updated on 12-Aug-2019

### Summary

Official Symbol	Arpc3 provided by MGI
Official Full Name	actin related protein 2/3 complex, subunit 3 provided by MGI
Primary source	MGI:MGI:1928375
See related	Ensembl:ENSMUSG00000029465
Gene type	protein coding
RefSeq status	VALIDATED
Organism	<i>Mus musculus</i>
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	p21-Ar; p21Arc; p21-ARC; 1110006A04Rik
Expression	Ubiquitous expression in placenta adult (RPKM 128.4), large intestine adult (RPKM 106.1) and 28 other tissues <a href="#">See more</a>
Orthologs	<a href="#">human</a> <a href="#">all</a>



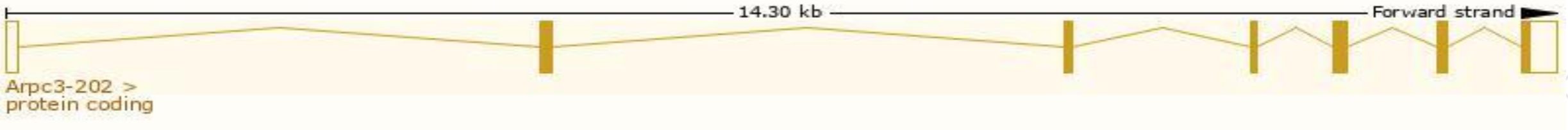


# Transcript information (Ensembl)

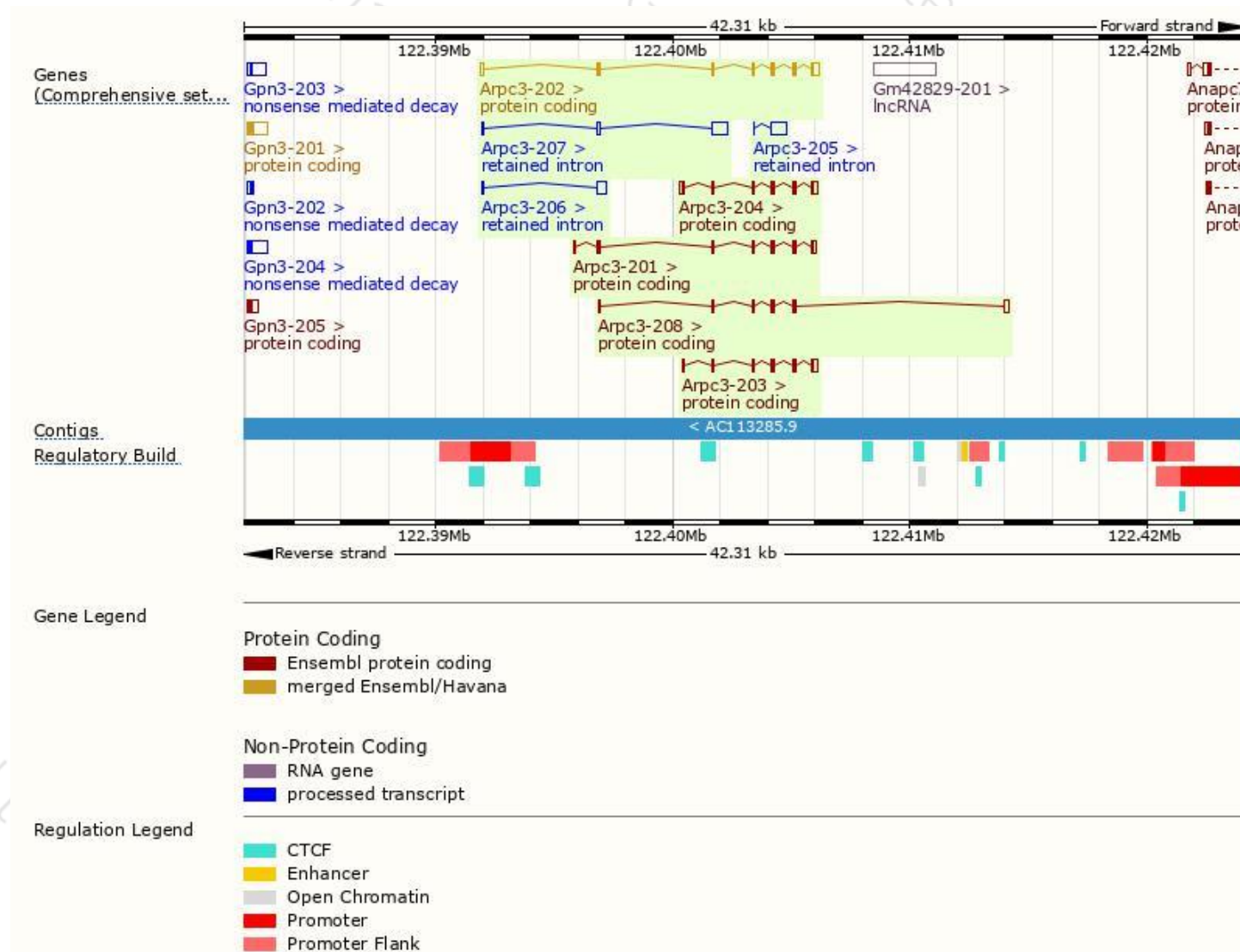
The gene has 8 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Translation ID	Biotype	CCDS	UniProt	Flags
Arpc3-202	<a href="#">ENSMUST00000102525.10</a>	899	<a href="#">178aa</a>	<a href="#">ENSMUSP00000099584.4</a>	Protein coding	<a href="#">CCDS19648</a>	<a href="#">Q9JM76</a>	TSL:1 GENCODE basic APPRIS P1
Arpc3-204	<a href="#">ENSMUST00000111716.7</a>	838	<a href="#">161aa</a>	<a href="#">ENSMUSP00000107345.1</a>	Protein coding	-	<a href="#">D3Z2F7</a>	TSL:2 GENCODE basic
Arpc3-201	<a href="#">ENSMUST00000031421.11</a>	736	<a href="#">170aa</a>	<a href="#">ENSMUSP00000031421.5</a>	Protein coding	-	<a href="#">H7BWZ3</a>	TSL:3 GENCODE basic
Arpc3-203	<a href="#">ENSMUST00000111713.1</a>	708	<a href="#">163aa</a>	<a href="#">ENSMUSP00000107342.1</a>	Protein coding	-	<a href="#">D3Z2F8</a>	TSL:3 GENCODE basic
Arpc3-208	<a href="#">ENSMUST00000196969.4</a>	599	<a href="#">142aa</a>	<a href="#">ENSMUSP00000143210.1</a>	Protein coding	-	<a href="#">A0A0G2JFK7</a>	CDS 5' incomplete TSL:3
Arpc3-207	<a href="#">ENSMUST00000148913.1</a>	856	No protein	-	Retained intron	-	-	TSL:2
Arpc3-205	<a href="#">ENSMUST00000126247.1</a>	672	No protein	-	Retained intron	-	-	TSL:5
Arpc3-206	<a href="#">ENSMUST00000141395.1</a>	409	No protein	-	Retained intron	-	-	TSL:2

The strategy is based on the design of *Arpc3-202* transcript,The transcription is shown below

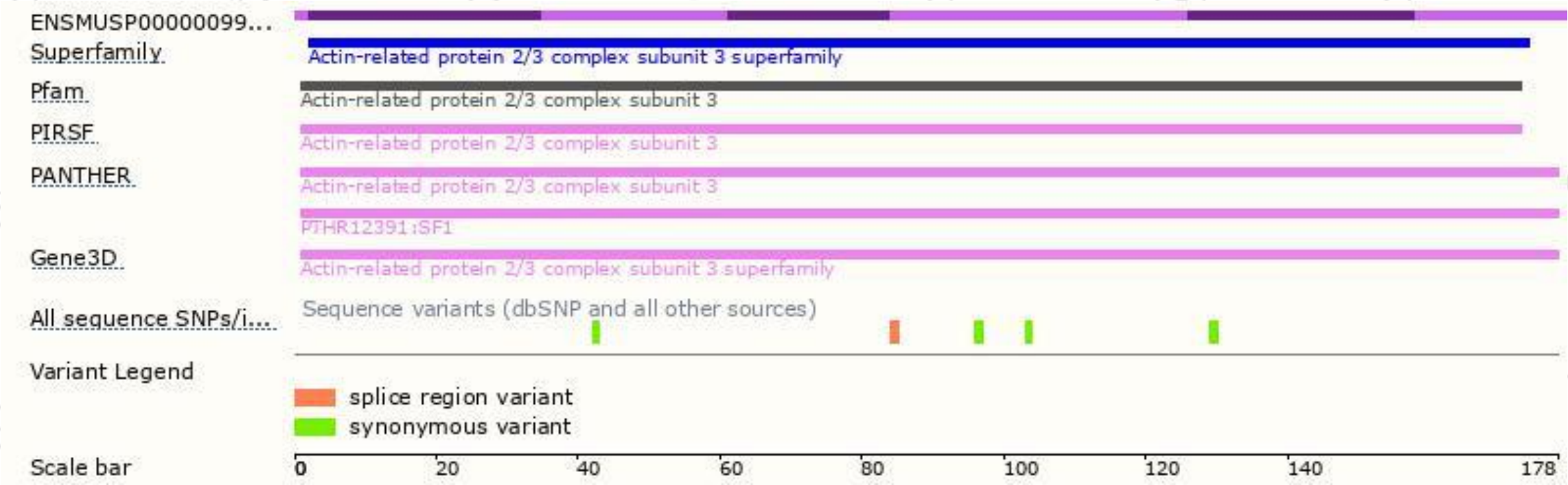


# Genomic location distribution



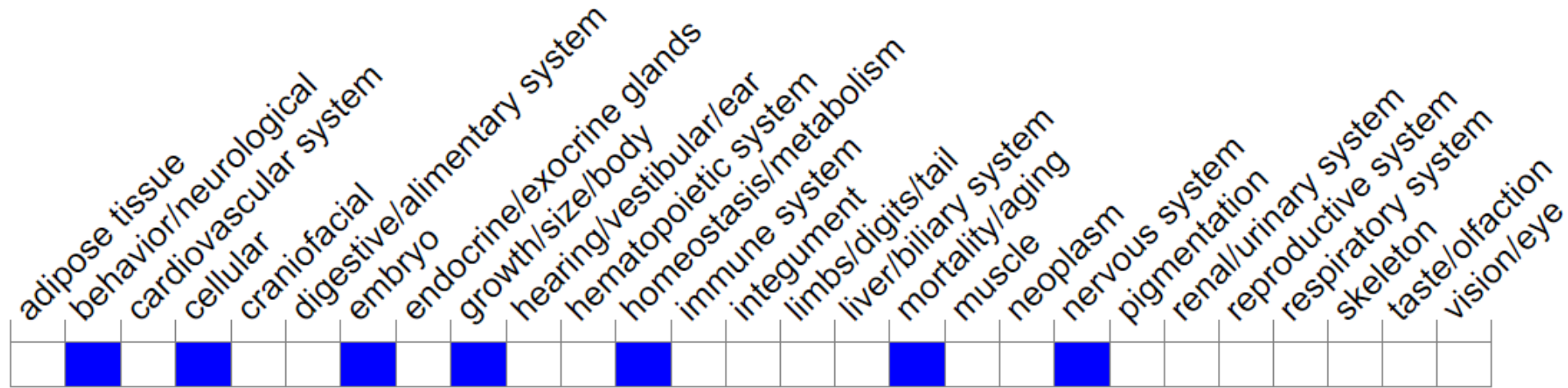


# Protein domain



# Mouse phenotype description(MGI)

## Phenotype Overview ?



*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 transposon-induced allele develop only to the blastocyst stage and show defects in trophoblast outgrowth and in the dynamics of actin accumulation. Mice heterozygous for the same transposon-induced allele and a knock-out allele show impaired trophoblast outgrowth activity.

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

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