

Polk Cas9-KO Strategy

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Reviewer:

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Design Date:

2019-12-2

Project Overview

Project Name

Polk

Project type

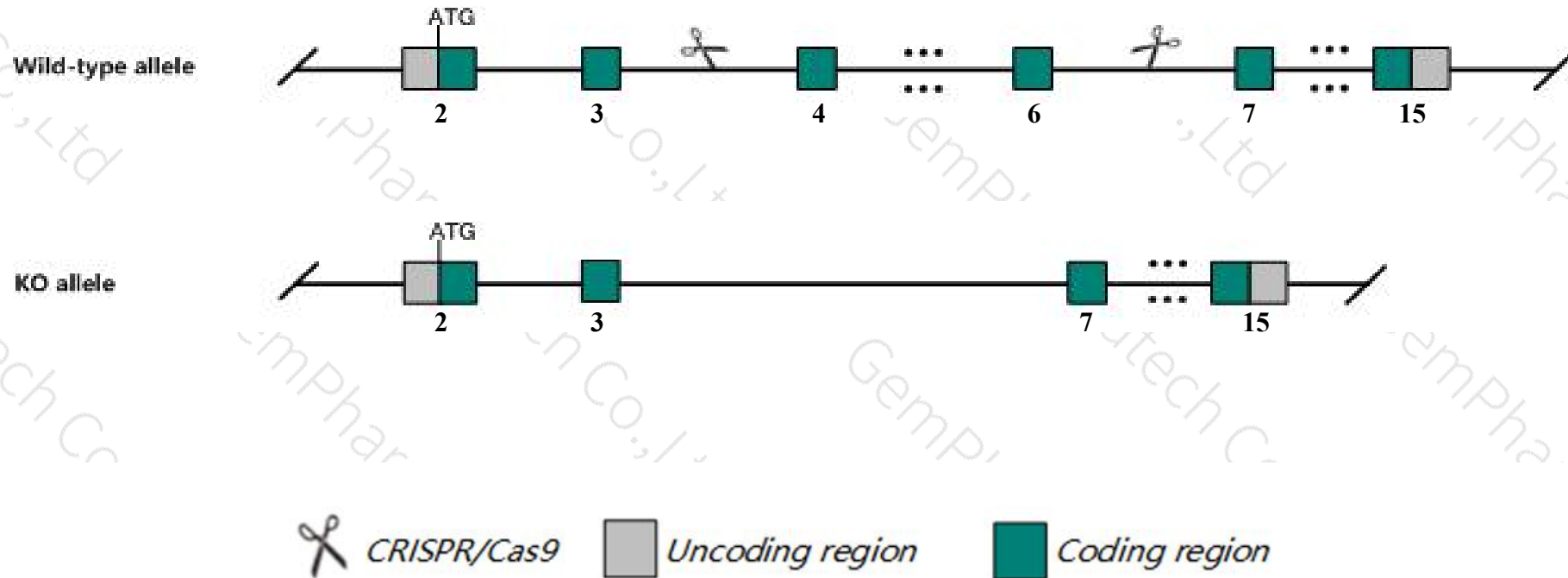
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

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



- The *Polk* gene has 11 transcripts. According to the structure of *Polk* gene, exon4-exon6 of *Polk-201* (ENSMUST00000022172.11) transcript is recommended as the knockout region. The region contains 439bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Polk* gene. The brief process is as follows: CRISPR/Cas9 system we

- According to the existing MGI data, Homozygous mutation of this gene that results in a truncated transcript results in a higher rate of spontaneous germline expanded simple tandem repeat mutations. Homozygous null mice exhibit normal immunoglobulin gene somatic hypermutation.
- The *Polk* 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)

Polk polymerase (DNA directed), kappa [*Mus musculus* (house mouse)]

Gene ID: 27015, updated on 24-Oct-2019

Summary



Official Symbol Polk provided by MGI

Official Full Name polymerase (DNA directed), kappa provided by MGI

Primary source [MGI:MGI:1349767](#)

See related [Ensembl:ENSMUSG00000021668](#)

Gene type protein coding

RefSeq status VALIDATED

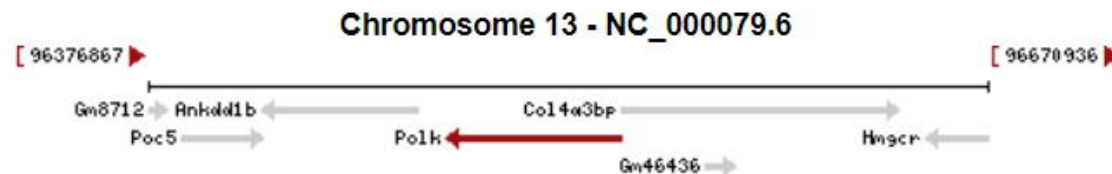
Organism [Mus musculus](#)

Lineage Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus

Also known as DINP; Dinb1

Expression Broad expression in bladder adult (RPKM 3.8), testis adult (RPKM 3.6) and 25 other tissues [See more](#)

Orthologs [human](#) [all](#)

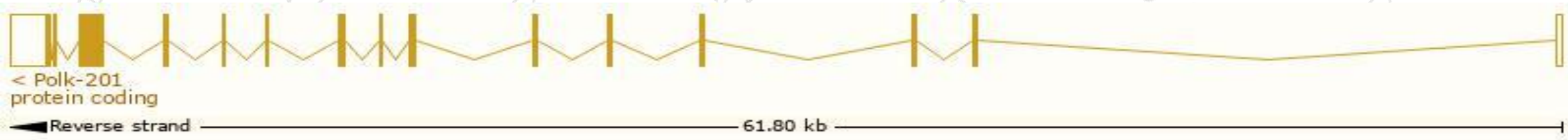


Transcript information (Ensembl)

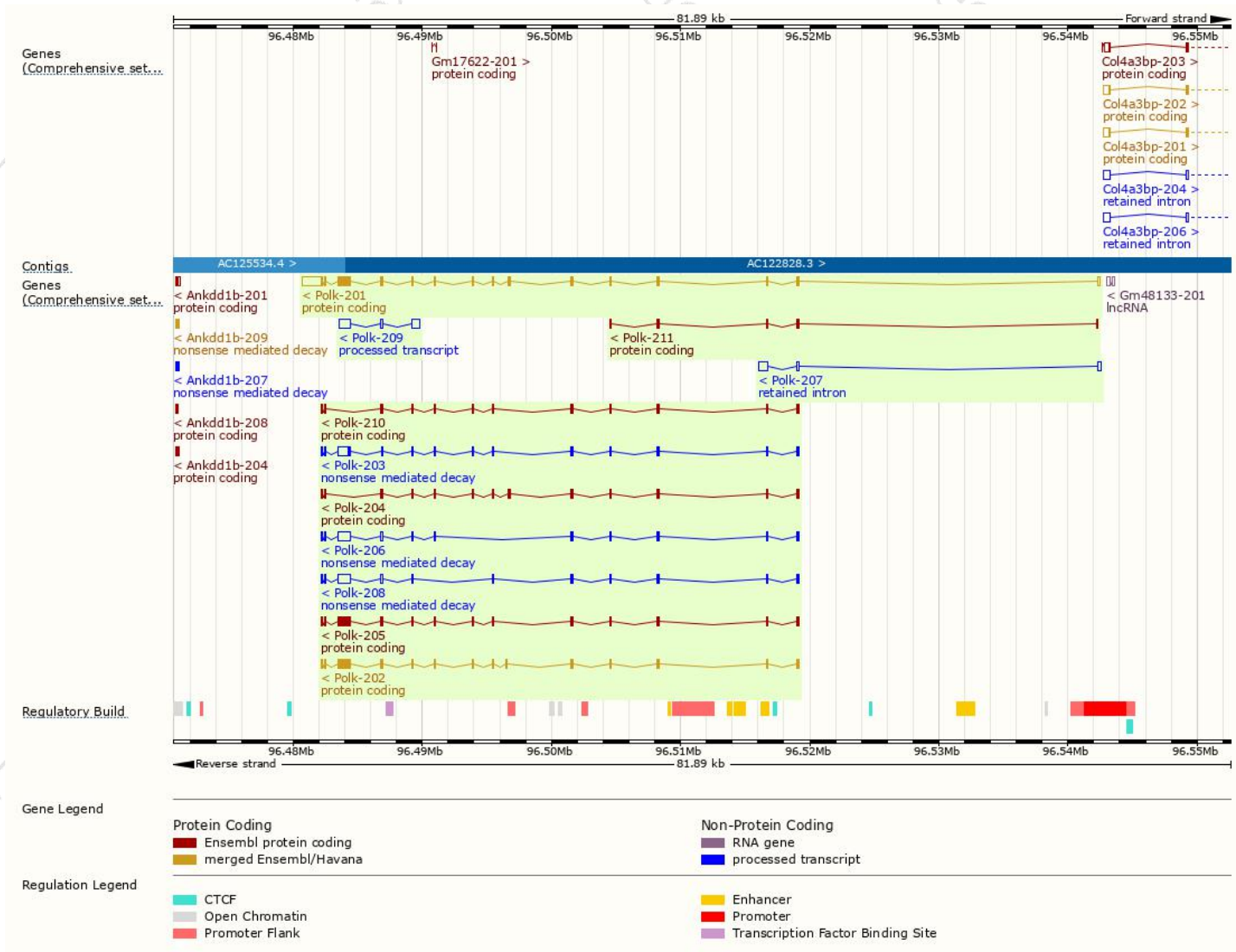
The gene has 11 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Translation ID	Biotype	CCDS	UniProt	Flags
Polk-201	ENSMUST00000022172.11	4225	852aa	ENSMUSP00000022172.4	Protein coding	CCDS26704	Q9QUG2	TSL:1 GENCODE basic APPRIS P2
Polk-202	ENSMUST00000091387.3	2382	793aa	ENSMUSP00000088950.3	Protein coding	CCDS84053	Q5Q9H7	TSL:1 GENCODE basic
Polk-205	ENSMUST00000221899.1	2319	772aa	ENSMUSP00000152647.1	Protein coding	-	Q5Q9H6	TSL:1 GENCODE basic
Polk-204	ENSMUST00000221645.1	1644	547aa	ENSMUSP00000152178.1	Protein coding	-	A0A1Y7VIV8	TSL:1 GENCODE basic APPRIS ALT2
Polk-210	ENSMUST00000222389.1	1404	467aa	ENSMUSP00000152192.1	Protein coding	-	Q5Q9H0	TSL:1 GENCODE basic
Polk-211	ENSMUST00000223475.1	651	169aa	ENSMUSP00000152658.1	Protein coding	-	A0A1Y7VJV3	CDS 3' incomplete TSL:5
Polk-203	ENSMUST00000220977.1	2282	453aa	ENSMUSP00000152322.1	Nonsense mediated decay	-	Q5Q9H5	TSL:1
Polk-208	ENSMUST00000222143.1	2119	275aa	ENSMUSP00000152468.1	Nonsense mediated decay	-	Q5Q9H4	TSL:1
Polk-206	ENSMUST00000222075.1	2027	237aa	ENSMUSP00000152139.1	Nonsense mediated decay	-	Q5Q9H3	TSL:1
Polk-207	ENSMUST00000222100.1	1089	No protein	-	Retained intron	-	-	TSL:1
Polk-209	ENSMUST00000222268.1	1671	No protein	-	lncRNA	-	-	TSL:3

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



Genomic location distribution

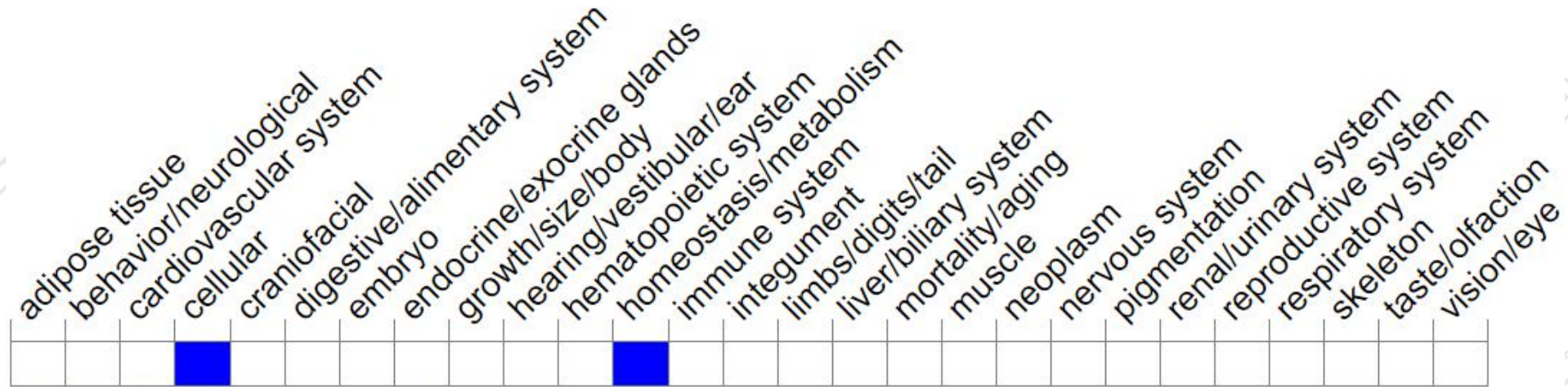


Protein domain



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, Homozygous mutation of this gene that results in a truncated transcript results in a higher rate of spontaneous germline expanded simple tandem repeat mutations. Homozygous null mice exhibit normal immunoglobulin gene somatic hypermutation.

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

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