

Krt2 Cas9-CKO Strategy

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Reviewer:

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Project Overview

Project Name

Krt2

Project type

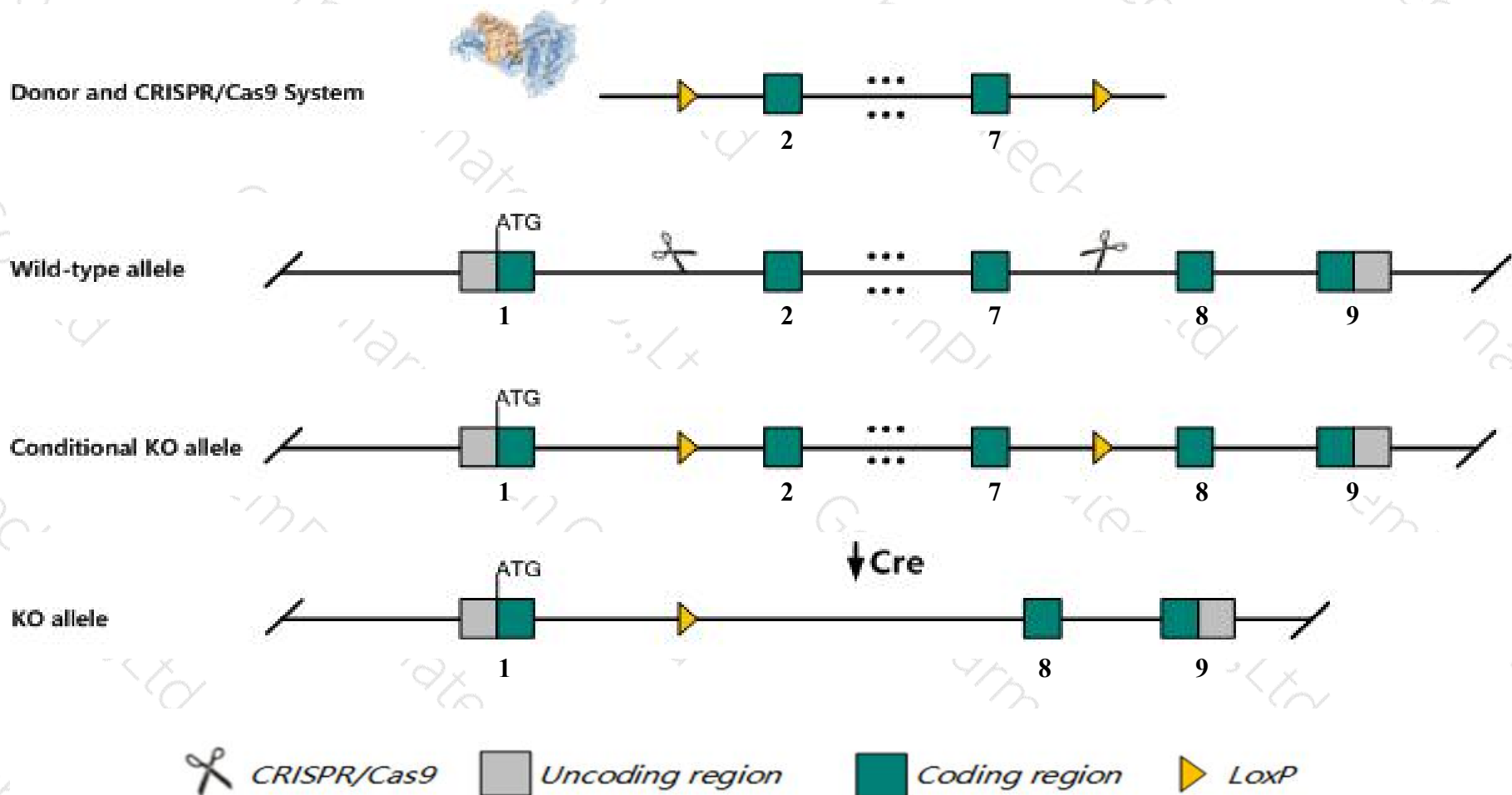
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Krt2* gene. The schematic diagram is as follows:



Technical routes

- The *Krt2* gene has 1 transcript. According to the structure of *Krt2* gene, exon2-exon7 of *Krt2-201* (ENSMUST00000023712.7) transcript is recommended as the knockout region. The region contains 884bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Krt2* 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.

- According to the existing MGI data,ENU-induced mutant mice exhibit scaly skin and increased pigmentation in the tail, ears and feet. Mice homozygous for a knock-out allele show scaly skin, acanthosis, hyperkeratosis, increased water loss, ear skin inflammation, and aberrant aggregation of keratin 10 in suprabasal epidermal keratinocytes.
- The *Krt2* gene is located on the Chr15. 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)

Krt2 keratin 2 [*Mus musculus* (house mouse)]

Gene ID: 16681, updated on 3-Sep-2019

Summary

- Official Symbol** Krt2 provided by [MGI](#)
- Official Full Name** keratin 2 provided by [MGI](#)
- Primary source** [MGI:MGI:96699](#)
- See related** [Ensembl:ENSMUSG00000064201](#)
- 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** Krt2e; Krt2-2; Krt2-17; BB005427
- Expression** Low expression observed in reference dataset [See more](#)
- Orthologs** [human](#) [all](#)

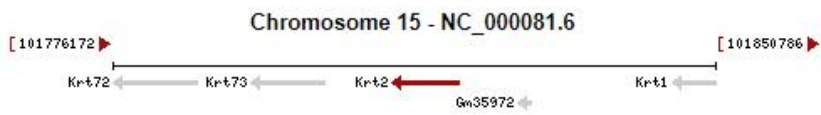
Genomic context

Location: 15 F2; 15 57.03 cM

[See Krt2 in Genome Data Viewer](#)

Exon count: 11

Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	15	NC_000081.6 (101810689..101818956, complement)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	15	NC_000081.5 (101641120..101648600, complement)

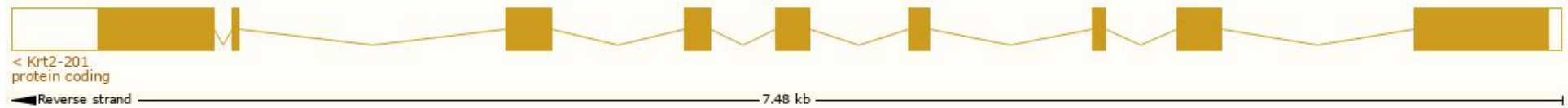


Transcript information (Ensembl)

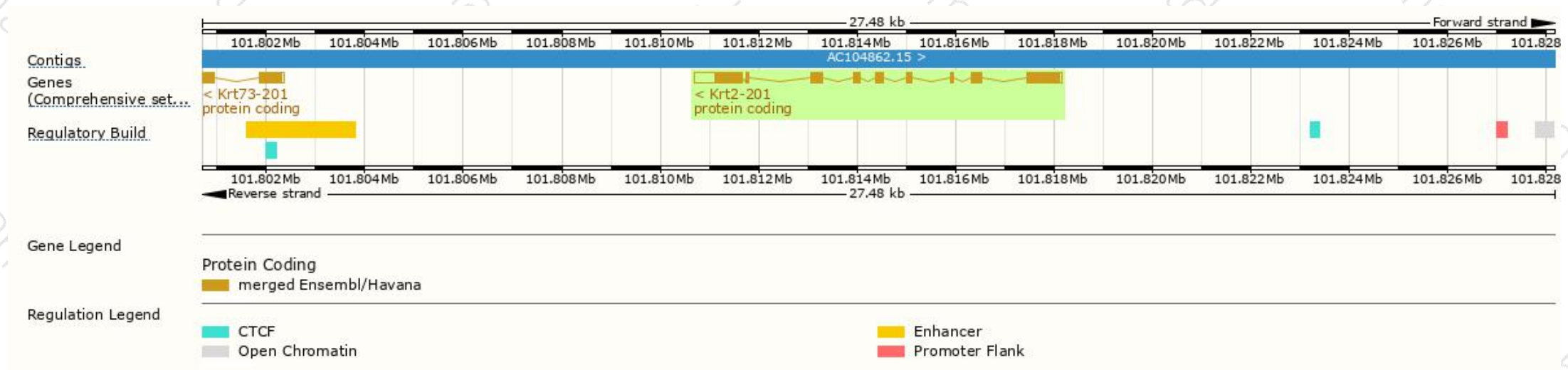
The gene has 1 transcript, and the transcript is shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Krt2-201	ENSMUST00000023712.7	2613	707aa	Protein coding	CCDS37220	Q3TTY5	TSL:1 GENCODE basic APPRIS P1

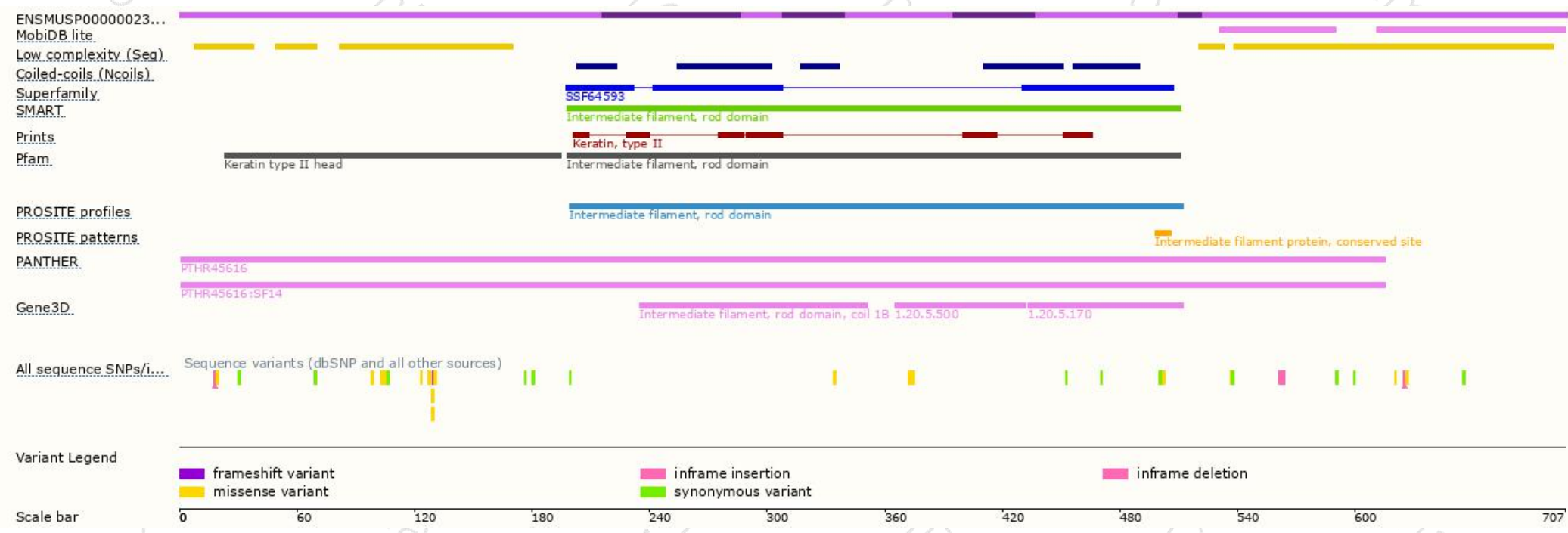
The strategy is based on the design of *Krt2-201* transcript, The transcription is shown below



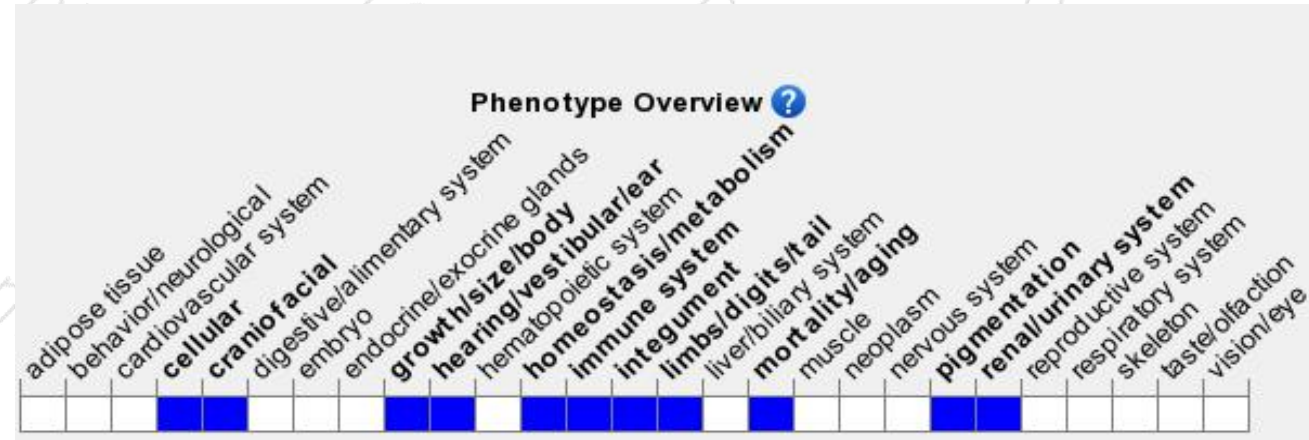
Genomic location distribution



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/>).

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

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