Ndrg3 Cas9-KO Strategy

Designer: Yun Li

Reviewer: Shuang Zhang

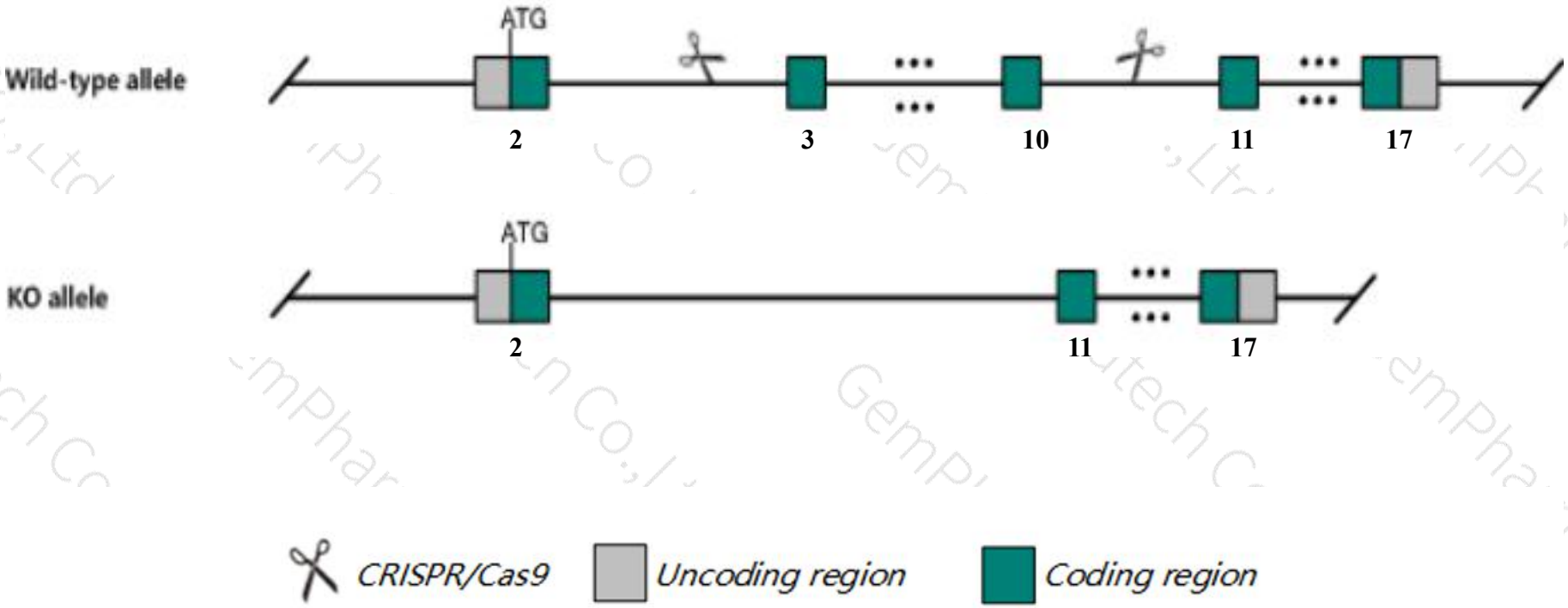
Design Date: 2021-4-6

Project Overview

Project Name	***Ndrg3***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Ndrg3* gene. The schematic diagram is as follows:



Technical routes

➢ The *Ndrg3* gene has 10 transcripts. According to the structure of *Ndrg3* gene, exon3-exon10 of *Ndrg3-201*(ENSMUST00000069600.12) transcript is recommended as the knockout region.The region contains 635bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Ndrg3* gene. The brief process is as follows: CRISPR/Cas9 system 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.

Notice

➢ According to the existing MGI data,homozygous mutation of this gene results in lethality before weaning. Mice heterozygous for another null allele exhibit reduced male fertility due to impaired double strand break repair in spermatocytes.

➢ The *Ndrg3* gene is located on the Chr2. 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）

集萃药康 GemPharmatech

Ndrg3 N-myc downstream regulated gene 3 [Mus musculus (house mouse)]

Gene ID: 29812, updated on 13-Mar-2020

Summary

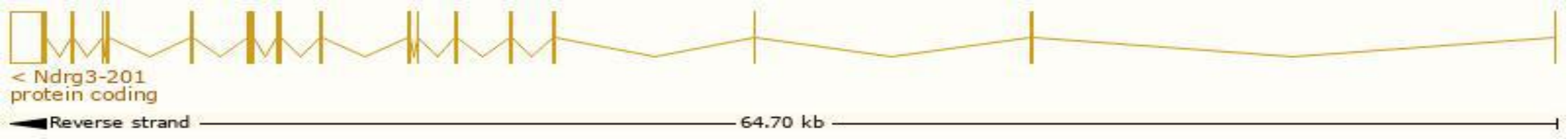
Official Symbol	Ndrg3 provided by MGI
Official Full Name	N-myc downstream regulated gene 3 provided by MGI
Primary source	MGI:MGI:1352499
See related	Ensembl:ENSMUSG00000027634
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	4833415O14Rik, AI747193, Ndr3
Expression	Broad expression in cerebellum adult (RPKM 162.3), cortex adult (RPKM 113.4) and 23 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

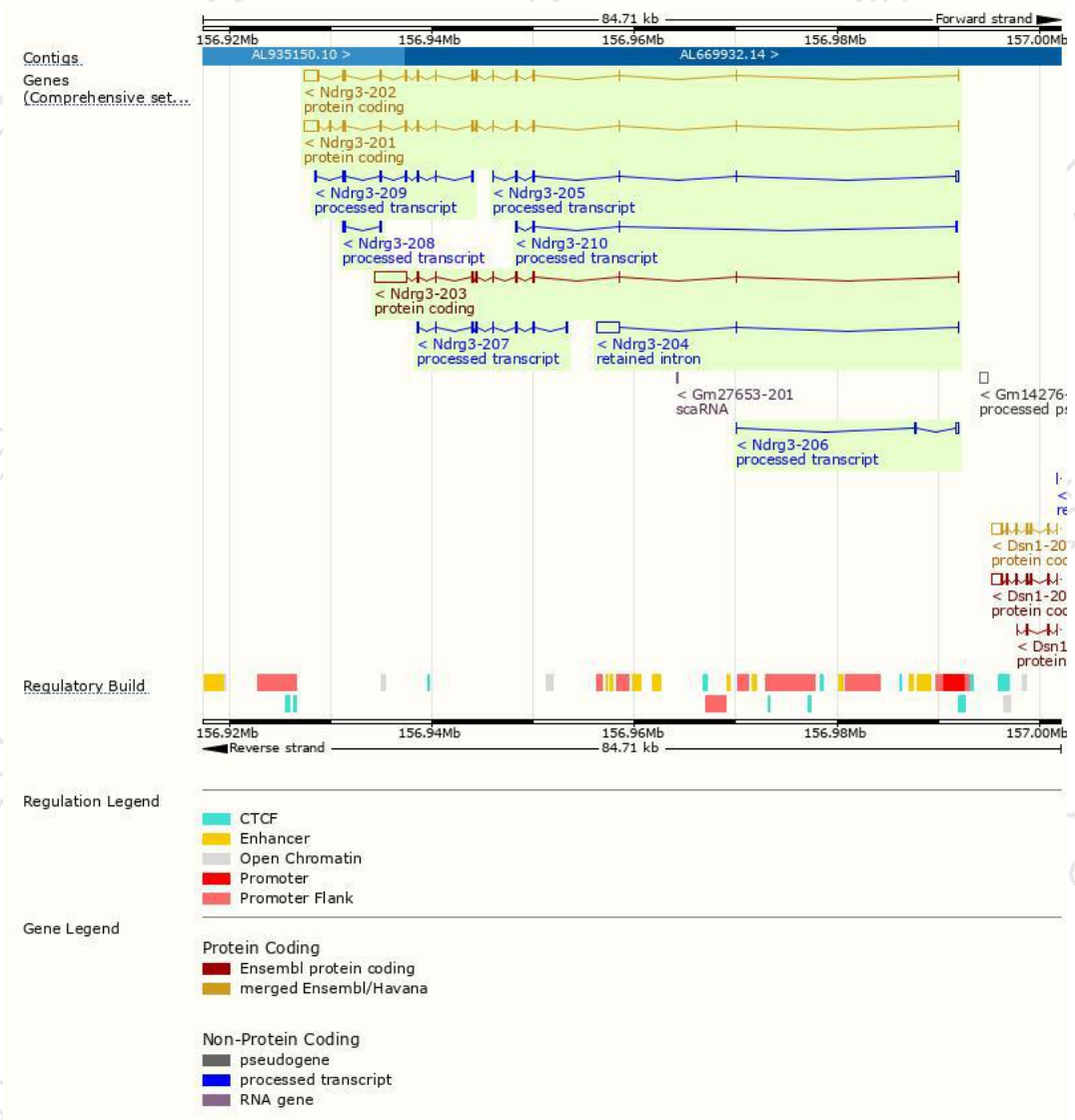
The gene has 10 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Ndrg3-201	ENSMUST00000069600.12	2612	388aa	Protein coding	CCDS50780	Q8VCV2	TSL:1 GENCODE basic APPRIS ALT1
Ndrg3-202	ENSMUST00000072298.12	2586	375aa	Protein coding	CCDS16971	Q544I1 Q9QYF9	TSL:1 GENCODE basic APPRIS P3
Ndrg3-203	ENSMUST00000109558.1	4023	253aa	Protein coding	-	Q8CBD0	TSL:1 GENCODE basic
Ndrg3-207	ENSMUST00000140297.7	706	No protein	Processed transcript	-	-	TSL:3
Ndrg3-205	ENSMUST00000131955.7	666	No protein	Processed transcript	-	-	TSL:5
Ndrg3-209	ENSMUST00000156491.7	595	No protein	Processed transcript	-	-	TSL:5
Ndrg3-206	ENSMUST00000132748.1	436	No protein	Processed transcript	-	-	TSL:3
Ndrg3-210	ENSMUST00000156651.1	410	No protein	Processed transcript	-	-	TSL:3
Ndrg3-208	ENSMUST00000149599.1	216	No protein	Processed transcript	-	-	TSL:3
Ndrg3-204	ENSMUST00000126627.1	2311	No protein	Retained intron	-	-	TSL:1

The strategy is based on the design of *Ndrg3-201* transcript,the transcription is shown below:

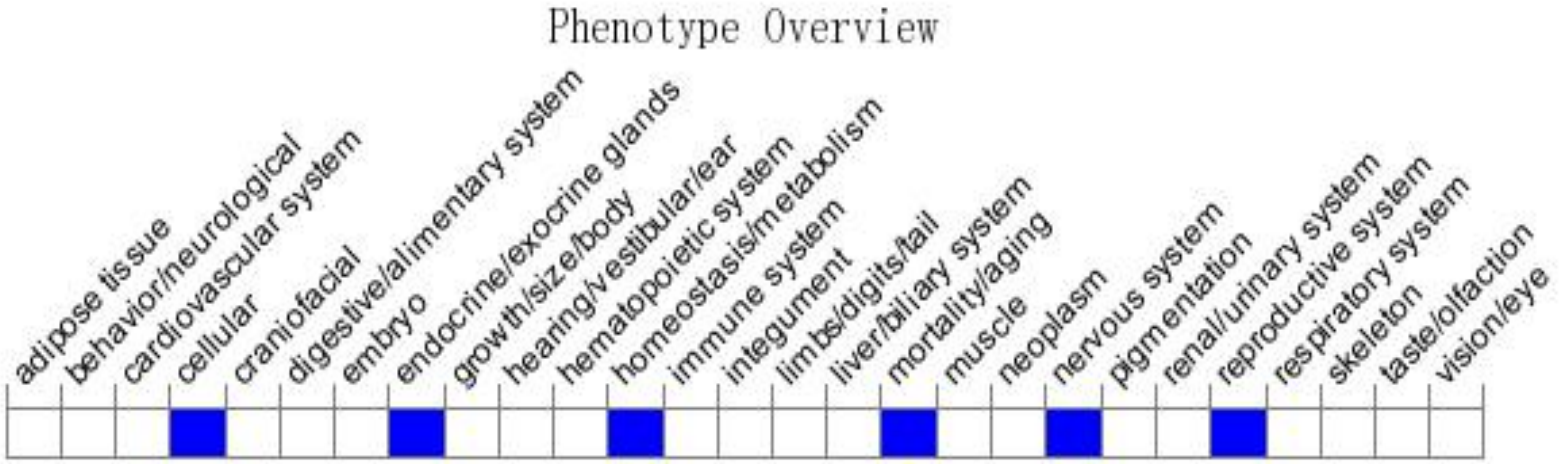


Genomic location distribution



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 lethality before weaning. Mice heterozygous for another null allele exhibit reduced male fertility due to impaired double strand break repair in spermatocytes.

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

Tel: 400-9660890

集萃药康生物科技
GemPharmatech Co.,Ltd