

Nrg4 Cas9-CKO Strategy

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Design Date: 2024-3-27

Overview

Target Gene Name

- *Nrg4*

Project Type

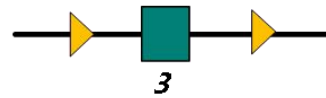
- Cas9-CKO

Genetic Background

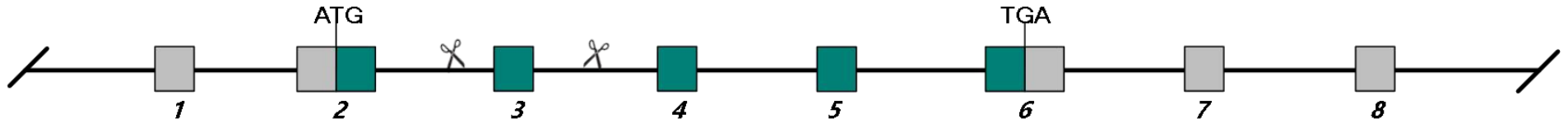
- C57BL/6JGpt

Strain Strategy

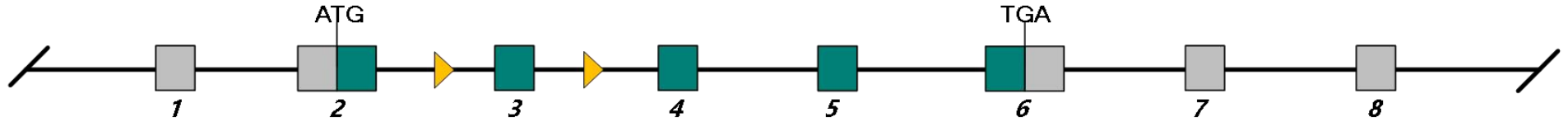
Donor and CRISPR-Cas9 System



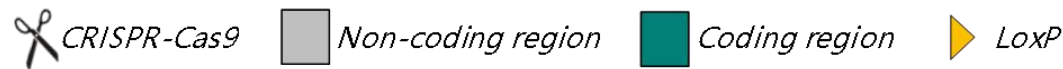
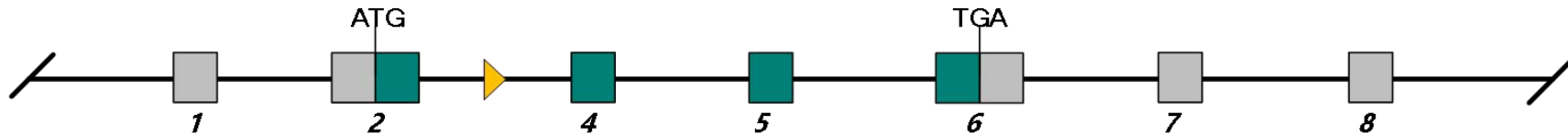
Wild-type allele



Conditional KO allele



KO allele



Schematic representation of CRISPR-Cas9 engineering used to edit the *Nrg4* gene.

Technical Information

- The *Nrg4* gene has 13 transcripts. According to the structure of *Nrg4* gene, exon 3 of *Nrg4*-213 (ENSMUST00000164721.8) is recommended as the knockout region. The region contains 94 bp of coding sequence. Knocking out the region will result in disruption of gene function.
- In this project we use CRISPR-Cas9 technology to modify *Nrg4* 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 on-target amplicon sequencing. A stable F1-generation mouse strain was obtained by mating positive F0-generation mice with C57BL/6JGpt mice and confirmation of the desired mutant allele was carried out by PCR and on-target amplicon sequencing.
- 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.

Gene Information

Nrg4 neuregulin 4 [*Mus musculus* (house mouse)]

Gene ID: 83961, updated on 5-Mar-2024

[Download Datasets](#)

Summary

Official Symbol	Nrg4 provided by MGI
Official Full Name	neuregulin 4 provided by MGI
Primary source	MGI:MGI:1933833
See related	Ensembl:ENSMUSG00000032311 AllianceGenome:MGI:1933833
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
Summary	Predicted to enable signaling receptor binding activity. Predicted to be involved in animal organ development and intracellular signal transduction. Predicted to be located in extracellular region and plasma membrane. Predicted to be integral component of membrane. Predicted to be active in extracellular space. Is expressed in several structures, including connective tissue; embryo mesenchyme; integumental system; surface ectoderm; and uterus. Orthologous to human NRG4 (neuregulin 4). [provided by Alliance of Genome Resources, Apr 2022]
Expression	Broad expression in mammary gland adult (RPKM 13.4), subcutaneous fat pad adult (RPKM 12.2) and 27 other tissues See more
Orthologs	human all
NEW	Try the new Gene table Try the new Transcript table

Genomic context

Location: 9 B; 9 29.87 cM

Exon count: 11

See Nrg4 in [Genome Data Viewer](#)

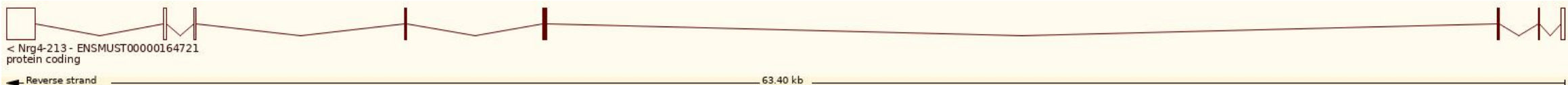
<https://www.ncbi.nlm.nih.gov/gene/83961>

Transcript Information

The gene has 13 transcripts, the transcripts are shown below:

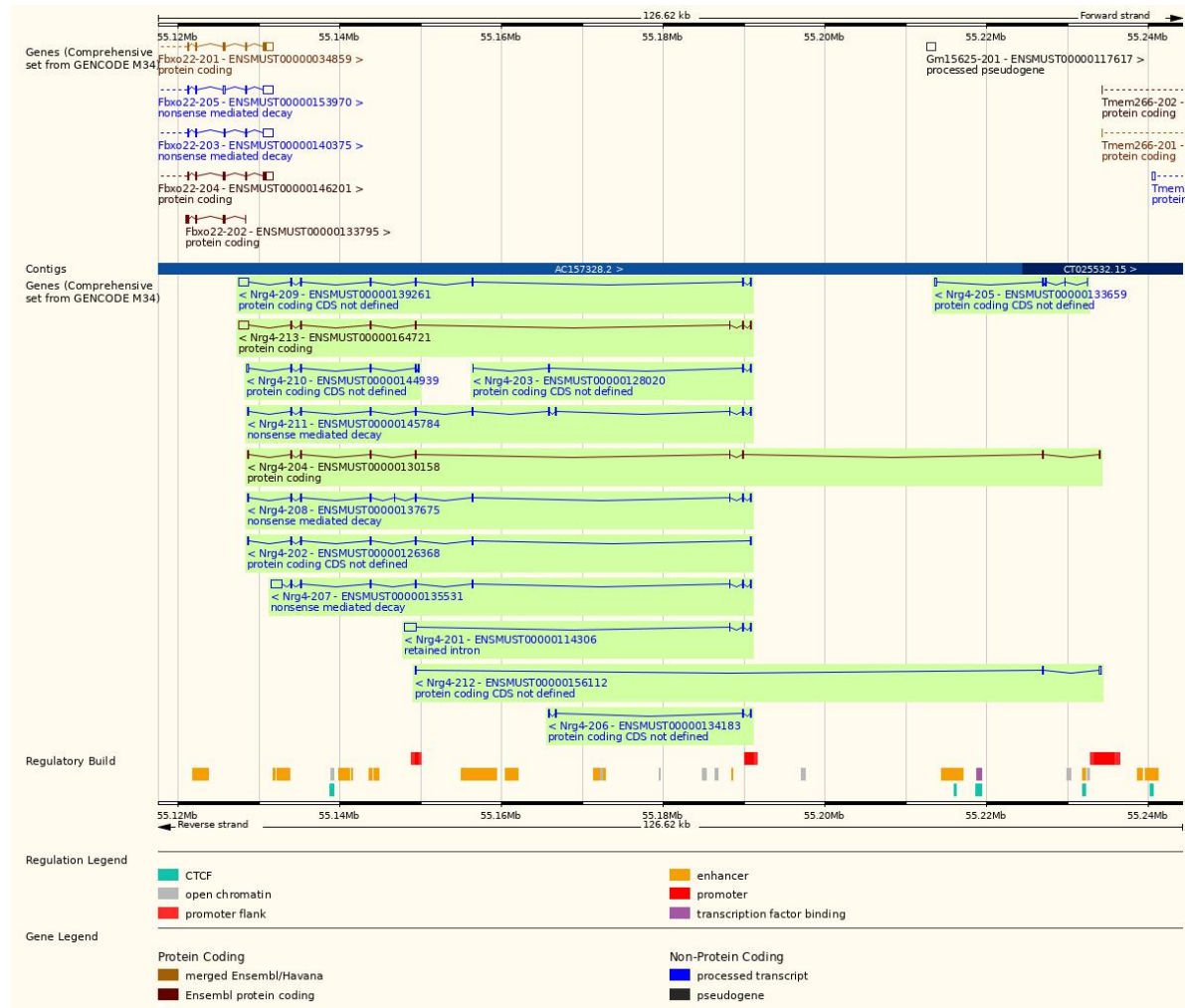
Show/hide columns (1 hidden)							Filter			
Transcript ID	Name	bp	Protein	Biotype	CCDS	UniProt Match	Flags			
ENSMUST00000164721.8	Nrg4-213	1927	115aa	Protein coding	CCDS52801	Q9WTX4	Ensembl Canonical	GENCODE basic	APPRIS P1	TSL:5
ENSMUST00000130158.8	Nrg4-204	1000	115aa	Protein coding	CCDS52801	Q9WTX4		GENCODE basic	APPRIS P1	TSL:5
ENSMUST00000145784.8	Nrg4-211	1145	80aa	Nonsense mediated decay		I6L9B2				TSL:2
ENSMUST00000135531.2	Nrg4-207	2095	37aa	Nonsense mediated decay		D6RE18				TSL:1
ENSMUST00000137675.8	Nrg4-208	942	37aa	Nonsense mediated decay		D6RE18				TSL:1
ENSMUST00000139261.8	Nrg4-209	1878	No protein	Protein coding CDS not defined		-				TSL:1
ENSMUST00000114306.2	Nrg4-201	1774	No protein	Retained intron		-				TSL:2
ENSMUST00000144939.8	Nrg4-210	721	No protein	Protein coding CDS not defined		-				TSL:3
ENSMUST00000133659.2	Nrg4-205	674	No protein	Protein coding CDS not defined		-				TSL:3
ENSMUST00000126368.8	Nrg4-202	654	No protein	Protein coding CDS not defined		-				TSL:3
ENSMUST00000156112.8	Nrg4-212	519	No protein	Protein coding CDS not defined		-				TSL:3
ENSMUST00000134183.2	Nrg4-206	381	No protein	Protein coding CDS not defined		-				TSL:3
ENSMUST00000128020.2	Nrg4-203	347	No protein	Protein coding CDS not defined		-				TSL:3

The strategy is based on the design of *Nrg4*-213 transcript, the transcription is shown below:

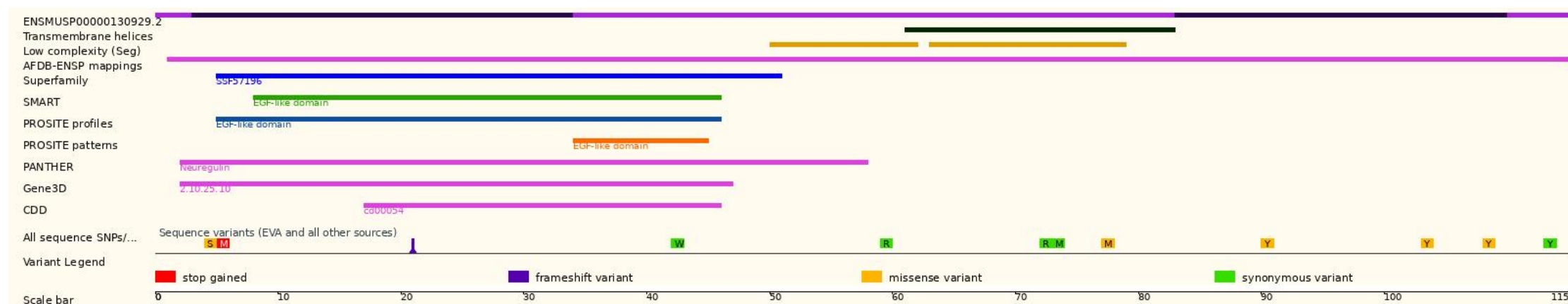


Source: <http://asia.ensembl.org/>

Genomic Information



Protein Information



Important Information

- This strategy may not affect *Nrg4*-205, *Nrg4*-210 transcript.
- *Nrg4* is located on Chr 9. If the knockout mice are crossed with other mouse strains to obtain double homozygous mutant offspring, please avoid the situation that the second gene is 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 the existing technology level.