

Eif4g3 Cas9-KO Strategy

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Overview

Target Gene Name

- Eif4g3

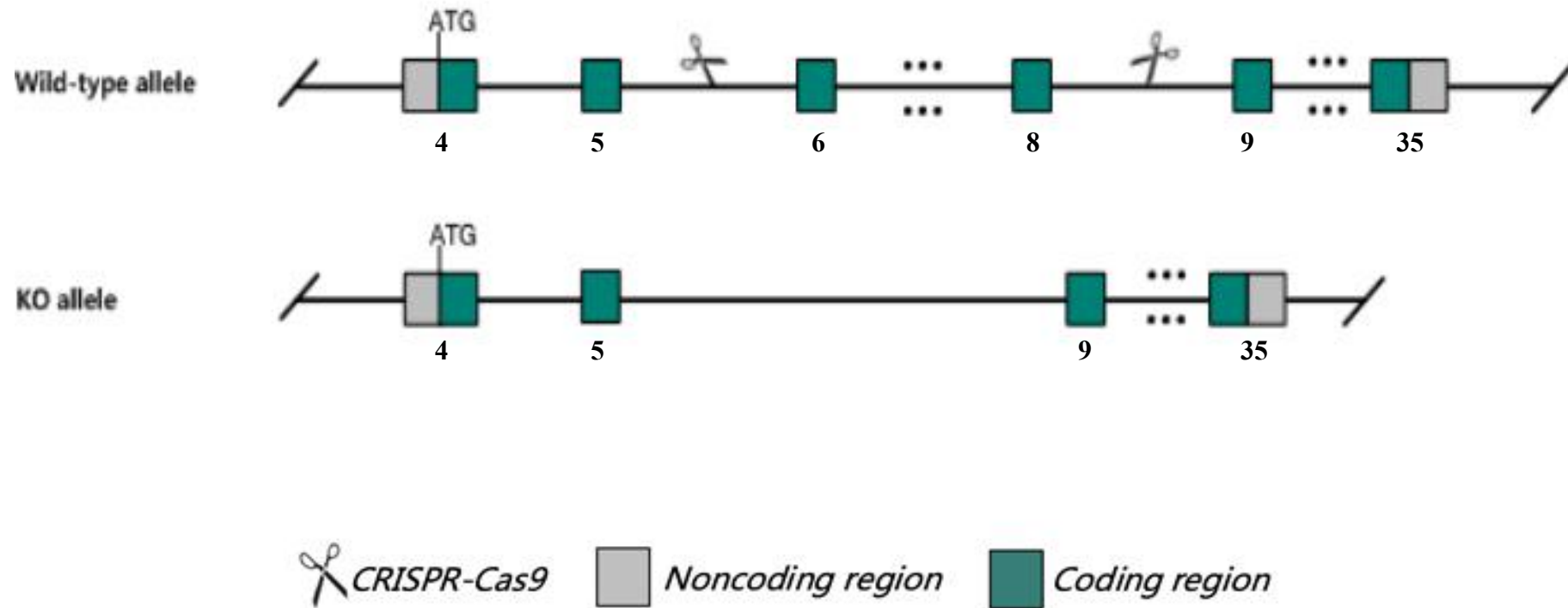
Project Type

- Cas9-KO

Genetic Background

- C57BL/6JGpt

Strain Strategy



Technical Information

- The *Eif4g3* gene has 15 transcripts. According to the structure of *Eif4g3* gene, exon6-exon8 of *Eif4g3*-202 (ENSMUST00000084214.12) transcript is recommended as the knockout region. The region contains 316bp coding sequence. Knocking out the region will result in disruption of protein function.
- In this project we use CRISPR-Cas9 technology to modify *Eif4g3* gene. The brief process is as follows: gRNAs were transcribed in vitro. Cas9 and gRNAs 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.

Gene Information

Eif4g3 eukaryotic translation initiation factor 4 gamma, 3 [*Mus musculus* (house mouse)]

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Gene ID: 230861, updated on 9-Aug-2024

Summary

Official Symbol	Eif4g3 provided by MGI
Official Full Name	eukaryotic translation initiation factor 4 gamma, 3 provided by MGI
Primary source	MGI:MGI:1923935
See related	Ensembl:ENSMUSG00000028760 AllianceGenome:MGI:1923935
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	repro8; Gm32394; eIF4GII; G1-419-52; 1500002J22Rik; 4930523M17Rik
Summary	Predicted to enable mRNA binding activity and translation initiation factor activity. Acts upstream of or within positive regulation of cellular protein metabolic process; positive regulation of meiosis I; and spermatogenesis. Predicted to be part of eukaryotic translation initiation factor 4F complex. Is expressed in nervous system; neural retina; and submandibular gland primordium. Orthologous to human EIF4G3 (eukaryotic translation initiation factor 4 gamma 3). [provided by Alliance of Genome Resources, Apr 2022]
Expression	Ubiquitous expression in testis adult (RPKM 43.2), CNS E11.5 (RPKM 29.8) and 28 other tissues See more
Orthologs	human all
NEW	Try the new Gene table
	Try the new Transcript table

Source: <https://www.ncbi.nlm.nih.gov/>

Transcript Information

The gene has 15 transcripts, all transcripts are shown below:

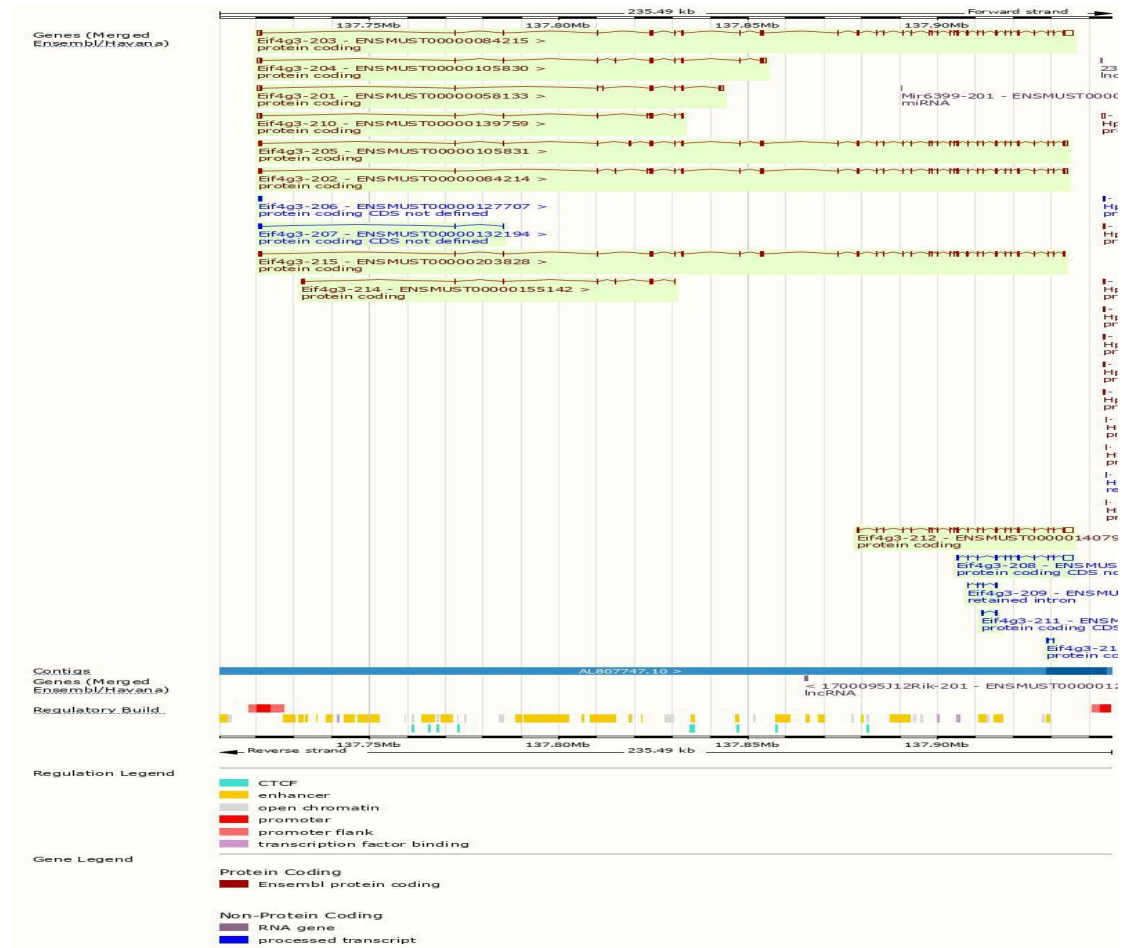
Transcript ID	Name	bp	Protein	Biotype	CCDS	UniProt Match	Flags
ENSMUST00000249658.1	Eif4g3-216	6134	1880aa	Protein coding		-	Ensembl Canonical Gencode basic
ENSMUST00000084215.12	Eif4g3-203	8134	1579aa	Protein coding		A2AMI2	Gencode basic APPRIS P4 TSL:5
ENSMUST00000105831.9	Eif4g3-205	6235	1567aa	Protein coding		Z4YKC4	Gencode basic APPRIS ALT2 TSL:5
ENSMUST00000084214.12	Eif4g3-202	6139	1578aa	Protein coding	CCDS38926	A0A0R4J112	Gencode basic APPRIS ALT2 TSL:1
ENSMUST00000203828.4	Eif4g3-215	5780	1762aa	Protein coding		A0A0N4SVL0	Gencode basic TSL:5
ENSMUST00000140796.2	Eif4g3-212	5363	1002aa	Protein coding		A2AMI7	TSL:5 CDS 5' incomplete
ENSMUST00000105830.9	Eif4g3-204	3252	509aa	Protein coding		A2AMI6	Gencode basic TSL:1
ENSMUST00000058133.10	Eif4g3-201	2663	235aa	Protein coding		Q8BQR8	Gencode basic TSL:1
ENSMUST00000139759.8	Eif4g3-210	1590	183aa	Protein coding		A2AMI4	TSL:5 CDS 3' incomplete
ENSMUST00000155142.2	Eif4g3-214	897	146aa	Protein coding		A2AMI3	TSL:2 CDS 3' incomplete
ENSMUST00000133902.8	Eif4g3-208	3765	No protein	Protein coding CDS not defined		-	TSL:1
ENSMUST00000148074.2	Eif4g3-213	539	No protein	Protein coding CDS not defined		-	TSL:2
ENSMUST00000132194.8	Eif4g3-207	489	No protein	Protein coding CDS not defined		-	TSL:5
ENSMUST00000140317.2	Eif4g3-211	470	No protein	Protein coding CDS not defined		-	TSL:2
ENSMUST00000127707.2	Eif4g3-206	340	No protein	Protein coding CDS not defined		-	TSL:3
ENSMUST00000135745.2	Eif4g3-209	794	No protein	Retained intron		-	TSL:1

The strategy is based on the design of *Eif4g3-202* transcript, the transcription is shown below:

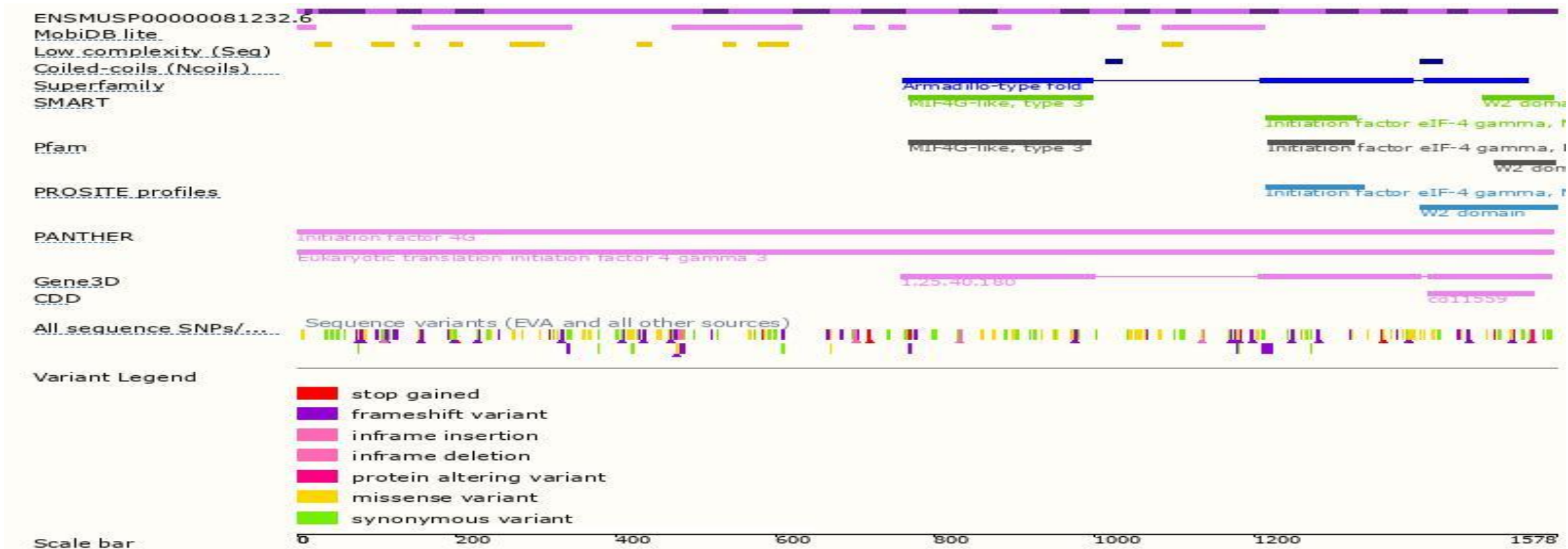


Source: <https://www.ensembl.org>

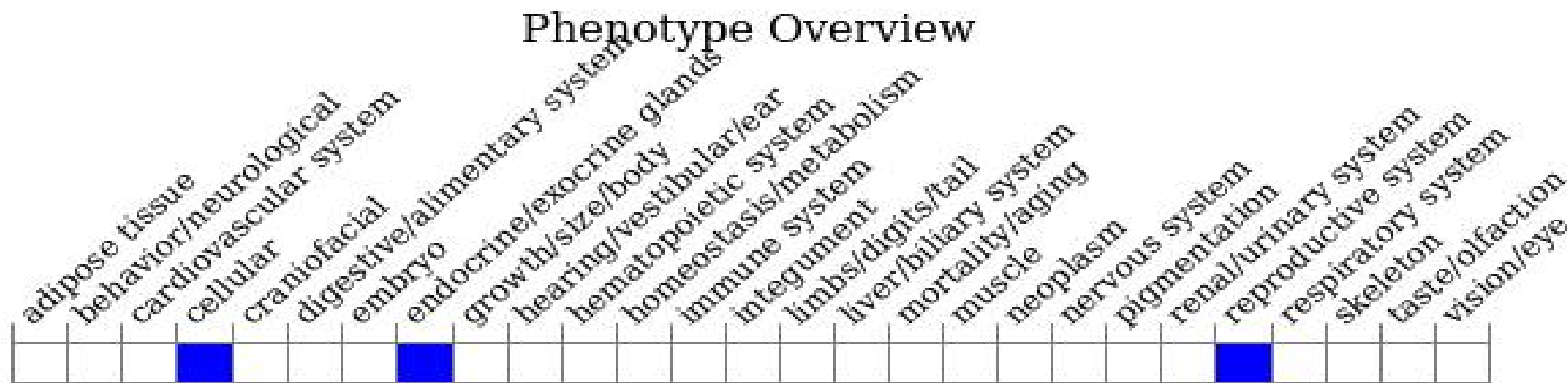
Genomic Information



Protein Information



Mouse Phenotype Information (MGI)



- Mice homozygous for an ENU induced allele exhibit decreased testes weight, azoospermia, and arrested male meiosis. Mice homozygous for a gene trapped allele exhibit small testes.

Important Information

- According to the existing MGI data, mice homozygous for an ENU induced allele exhibit decreased testes weight, azoospermia, and arrested male meiosis. Mice homozygous for a gene trapped allele exhibit small testes.
- This strategy may not affect *Eif4g3* -212, *Eif4g3* -206 , *Eif4g3* -207, *Eif4g3* -208 , *Eif4g3* -209, *Eif4g3* -211 and *Eif4g3* -213 transcripts .
- *Eif4g3* is located on Chr4. 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 risks of the mutation on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.