

Musk Cas9-KO Strategy

Designer:

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Project Overview

Project Name

Musk

Project type

Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

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



Technical routes

The *Musk* gene has 8 transcripts. According to the structure of *Musk* gene, exon2 of *Musk-203* (ENSMUST00000098057.9) transcript is recommended as the knockout region. The region contains 127bp coding sequence. Knock out the region will result in disruption of protein function.

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

According to the existing MGI data, Homozygotes for a targeted null mutation lack neuromuscular synapses and spontaneous movement, and die at birth of respiratory failure.

The *Musk* gene is located on the Chr4. 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.

Musk muscle, skeletal, receptor tyrosine kinase [Mus musculus (house mouse)]

Gene ID: 18198, updated on 26-Mar-2019

Summary



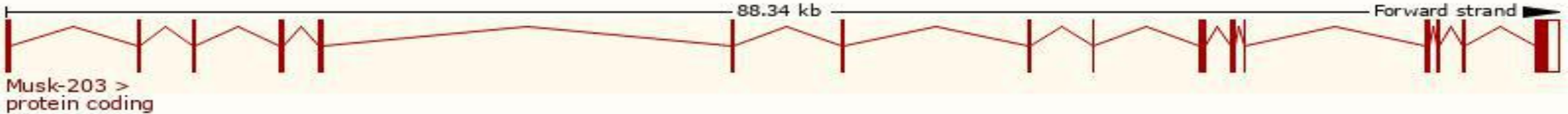
Official Symbol	Musk provided by MGI
Official Full Name	muscle, skeletal, receptor tyrosine kinase provided by MGI
Primary source	MGI:MGI:103581
See related	Ensembl:ENSMUSG000000057280
Gene type	protein coding
RefSeq status	REVIEWED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Mdk4, Milk, Nsk1, Nsk2, Nsk3
Summary	This gene encodes a member of the protein tyrosine kinase family. The encoded protein is a type 1 receptor-like protein located in muscle membrane that is activated by the heparan sulfate proteoglycan agrin released by nerve cells. The encoded protein activates signaling cascades responsible for multiple aspects of motor neuron and muscle development, including organization of the postsynaptic membrane, synaptic gene transcription, patterning of skeletal muscle, anchoring of acetylcholinesterase, and guidance of motor axons. Alternatively spliced transcript variants encoding different isoforms have been described. [provided by RefSeq, Jul 2008]
Expression	Broad expression in limb E14.5 (RPKM 1.2), colon adult (RPKM 0.4) and 16 other tissues See more
Orthologs	human all

Transcript information Ensembl

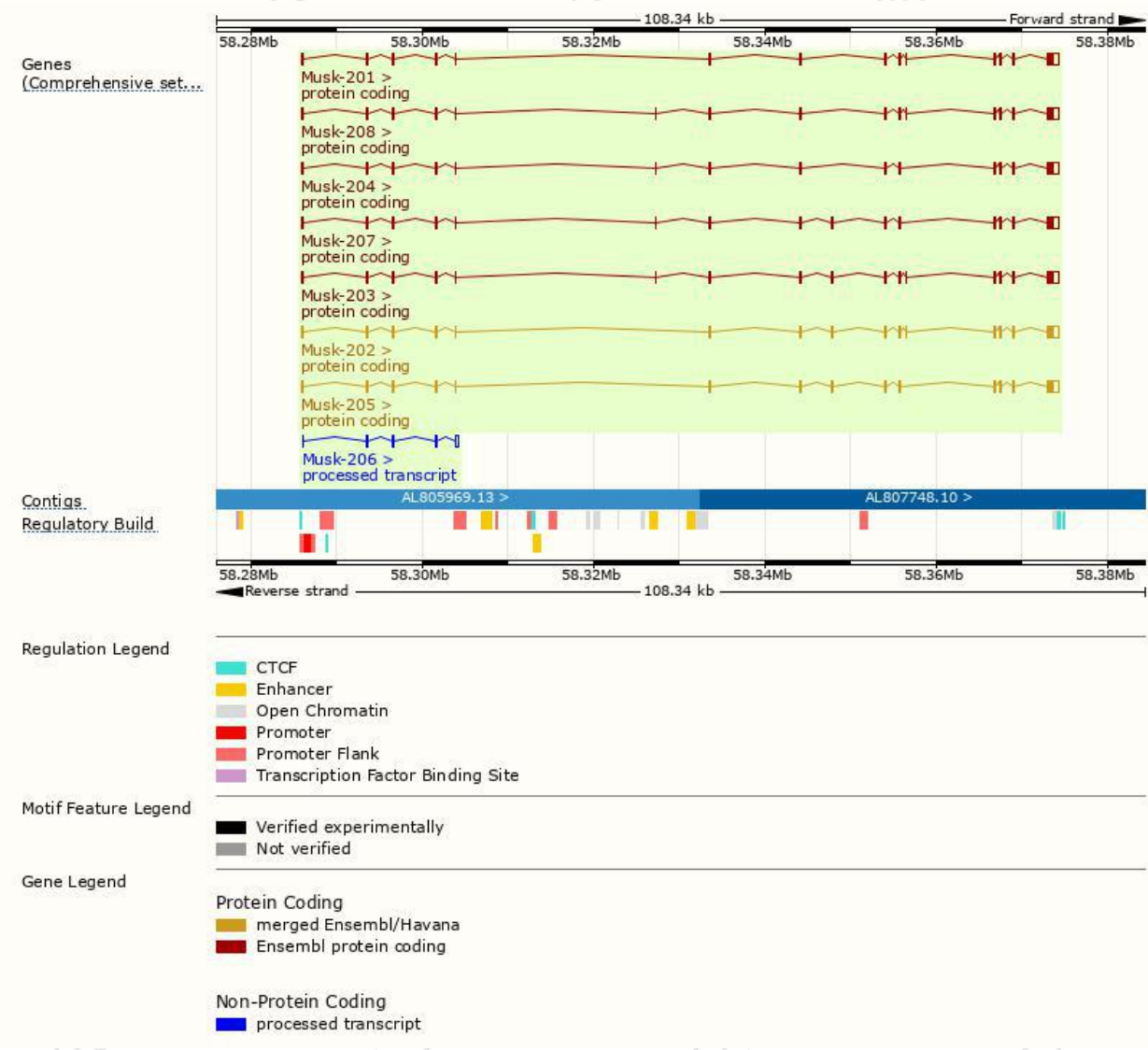
The gene has 8 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Musk-203	ENSMUST00000098057.9	3422	893aa	Protein coding	CCDS51182	E9PVV8	TSL:1 GENCODE basic
Musk-207	ENSMUST00000177951.7	3352	870aa	Protein coding	CCDS38770	Q497X0	TSL:5 GENCODE basic APPRIS ALT 2
Musk-202	ENSMUST00000084578.11	3347	868aa	Protein coding	CCDS18211	Q32S50 Q61006	TSL:5 GENCODE basic APPRIS P4
Musk-205	ENSMUST00000102893.9	3323	860aa	Protein coding	CCDS18210	Q32S49 Q61006	TSL:5 GENCODE basic APPRIS ALT 2
Musk-208	ENSMUST00000179951.1	3376	878aa	Protein coding	-	J3QPS3	TSL:5 GENCODE basic APPRIS ALT 2
Musk-204	ENSMUST00000098059.9	3352	870aa	Protein coding	-	F6WVU1	TSL:5 GENCODE basic APPRIS ALT 2
Musk-201	ENSMUST00000081919.11	3348	868aa	Protein coding	-	K3W4P7	TSL:1 GENCODE basic APPRIS ALT 2
Musk-206	ENSMUST00000135879.1	903	No protein	Processed transcript	-	-	TSL:3

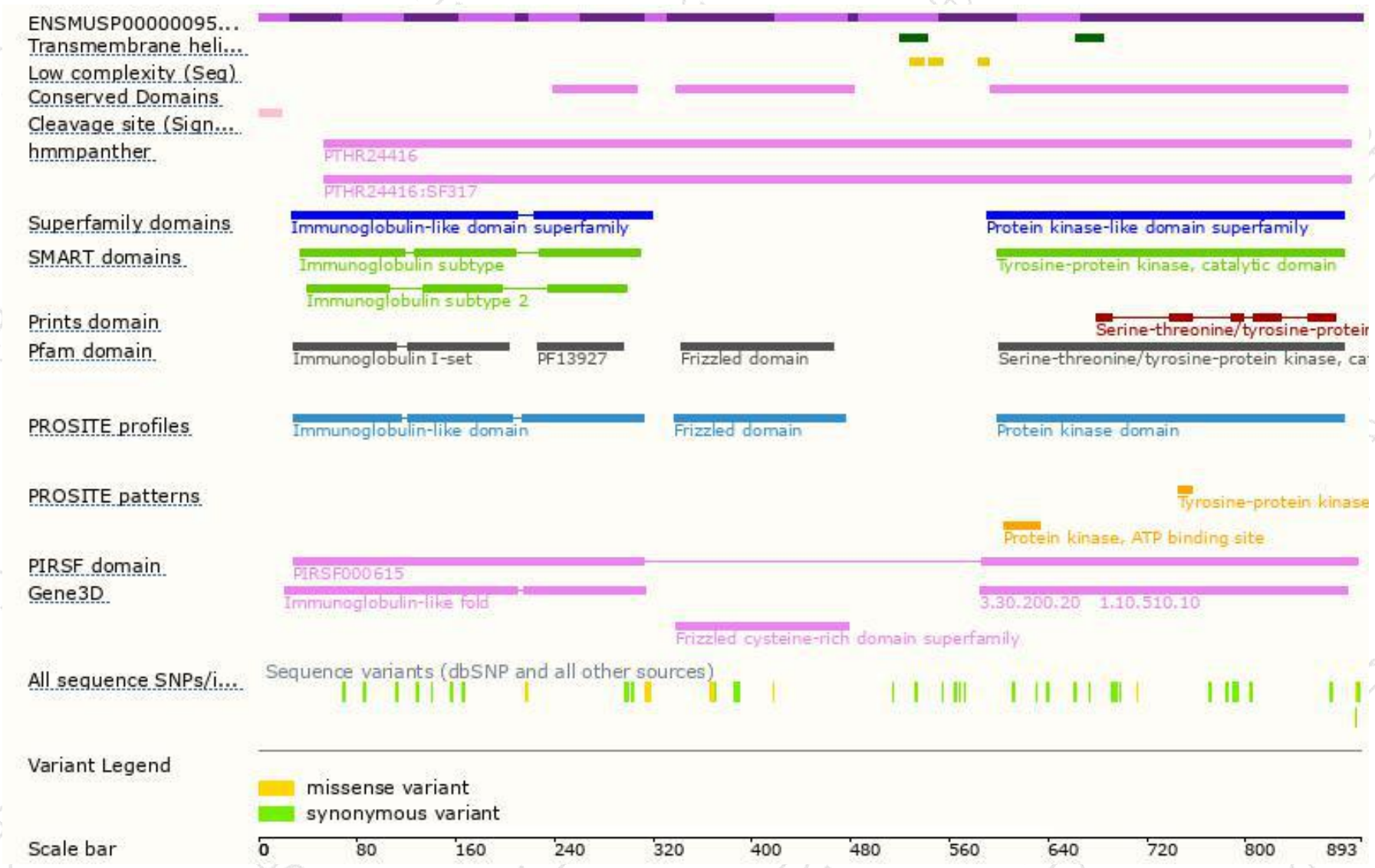
The strategy is based on the design of *Musk-203* transcript,The transcription is shown below



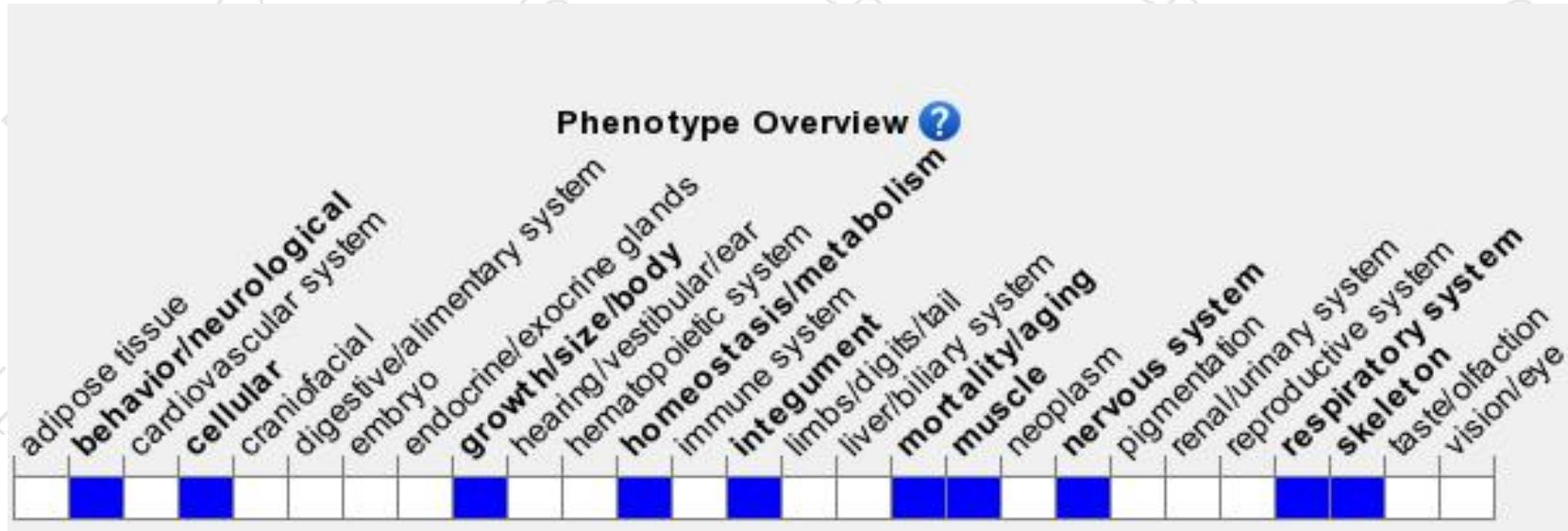
Genomic location distribution



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, Homozygotes for a targeted null mutation lack neuromuscular synapses and spontaneous movement, and die at birth of respiratory failure.

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

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