

# *Nfe2l2* Cas9-KO Strategy

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# Project Overview

**Project Name**

*Nfe2l2*

**Project type**

**Cas9-KO**

**Strain background**

**C57BL/6J**

# Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Nfe2l2* gene. The schematic diagram is as follows:



- The *Nfe2l2* gene has 2 transcripts. According to the structure of *Nfe2l2* gene, exon2-exon5 of *Nfe2l2-201* (ENSMUST00000102672.4) transcript is recommended as the knockout region. The region contains most of the coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Nfe2l2* gene. The brief process is as follows: sgRNA was transcribed in vitro. Cas9 and sgRNA were microinjected into the fertilized eggs of C57BL/6J 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/6J mice.

- According to the existing MGI data, Mice homozygous for a knock-out allele exhibit increased sensitivity to oxidative stress in a variety of organs and cells including brain, liver, erythrocytes, and spleen, abnormal tooth enamel, and abnormal response to various injuries, chemical treatments, and induced inflammatory diseases.
- The *Nfe2l2* 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)

## Nfe2l2 nuclear factor, erythroid derived 2, like 2 [Mus musculus (house mouse)]

Gene ID: 18024, updated on 9-Apr-2019

### Summary



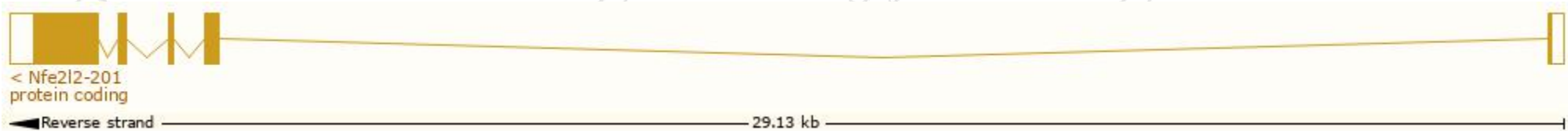
<b>Official Symbol</b>	Nfe2l2 provided by <a href="#">MGI</a>
<b>Official Full Name</b>	nuclear factor, erythroid derived 2, like 2 provided by <a href="#">MGI</a>
<b>Primary source</b>	<a href="#">MGI:MGI:108420</a>
<b>See related</b>	<a href="#">Ensembl:ENSMUSG00000015839</a>
<b>Gene type</b>	protein coding
<b>RefSeq status</b>	REVIEWED
<b>Organism</b>	<a href="#">Mus musculus</a>
<b>Lineage</b>	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
<b>Also known as</b>	Nrf2
<b>Summary</b>	This gene encodes a transcription factor which is a member of a small family of basic leucine zipper (bZIP) proteins. The encoded transcription factor regulates genes which contain antioxidant response elements (ARE) in their promoters; many of these genes encode proteins involved in response to injury and inflammation which includes the production of free radicals. [provided by RefSeq, Sep 2015]
<b>Expression</b>	Ubiquitous expression in bladder adult (RPKM 57.1), duodenum adult (RPKM 26.8) and 26 other tissues <a href="#">See more</a>
<b>Orthologs</b>	<a href="#">human</a> <a href="#">all</a>

# Transcript information (Ensembl)

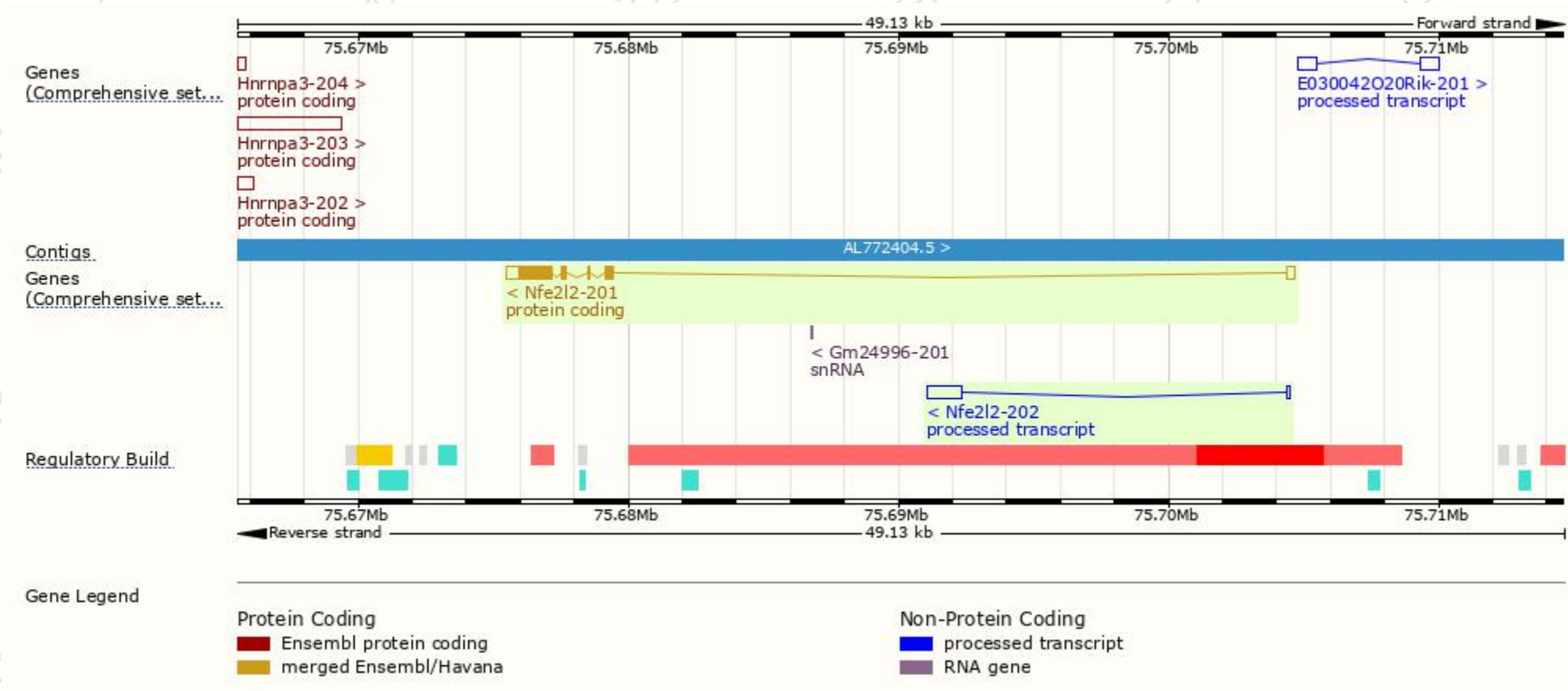
The gene has 2 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Nfe2l2-201	<a href="#">ENSMUST00000102672.4</a>	2475	<a href="#">597aa</a>	Protein coding	<a href="#">CCDS16150</a>	<a href="#">Q60795</a>	TSL:1 GENCODE basic APPRIS P1
Nfe2l2-202	<a href="#">ENSMUST00000152371.1</a>	1447	No protein	Processed transcript	-	-	TSL:1

The strategy is based on the design of *Nfe2l2-201* transcript,The transcription is shown below

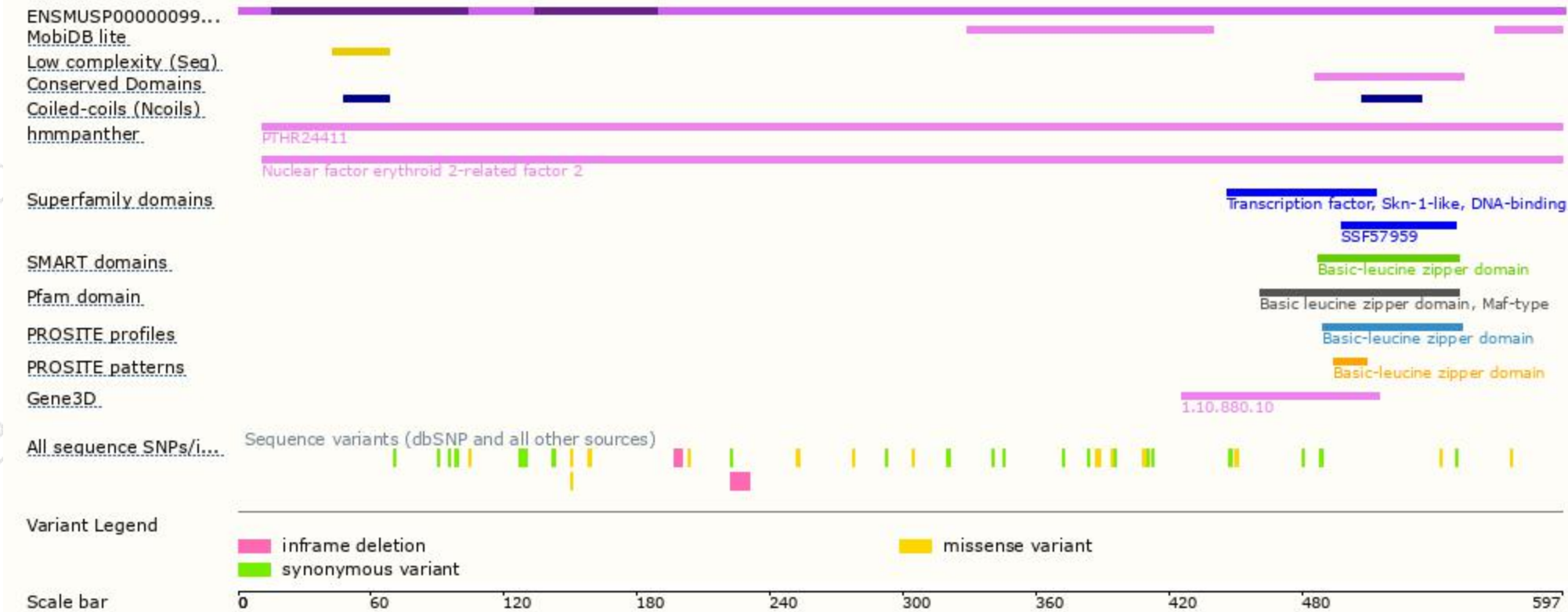


# Genomic location distribution

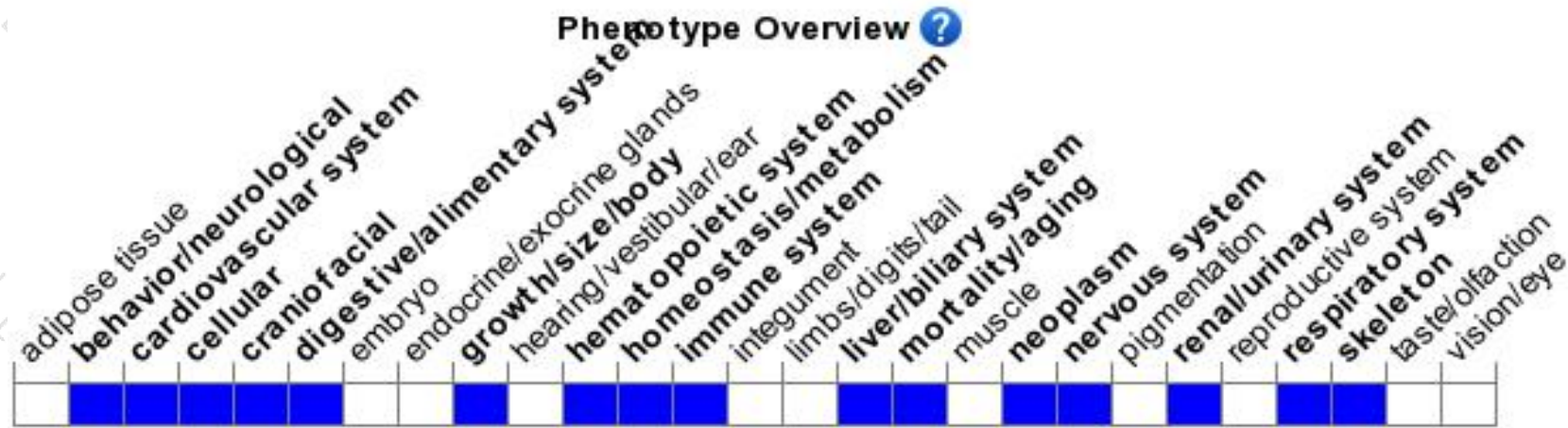




# Protein domain



# 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, Mice homozygous for a knock-out allele exhibit increased sensitivity to oxidative stress in a variety of organs and cells including brain, liver, erythrocytes, and spleen, abnormal tooth enamel, and abnormal response to various injuries, chemical treatments, and induced inflammatory diseases.

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

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