

# ***Wars2 Cas9-CKO Strategy***

**Designer:**

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# Project Overview

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**Project Name**

***Wars2***

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**Project type**

**Cas9-CKO**

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**Strain background**

**C57BL/6JGpt**

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# Conditional Knockout strategy

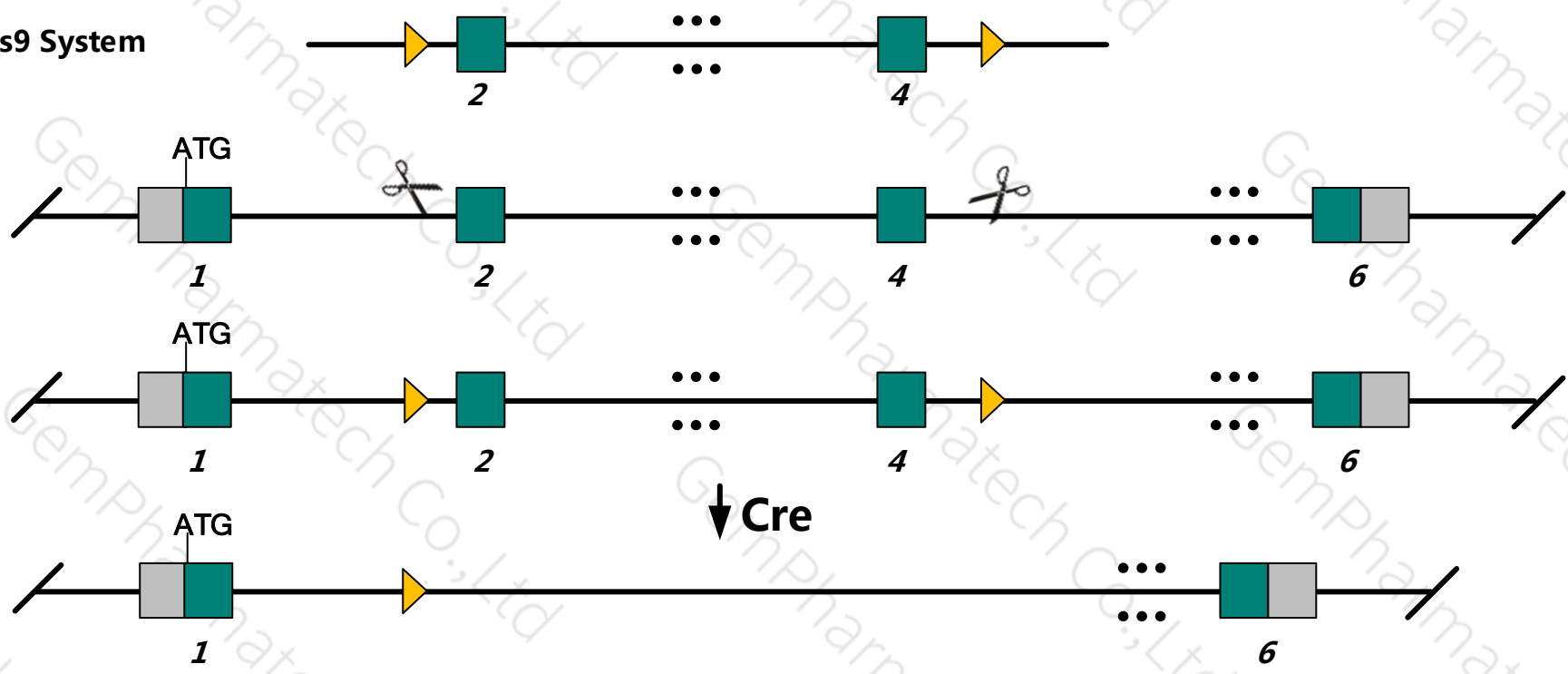
This model will use CRISPR/Cas9 technology to edit the *Wars2* gene. The schematic diagram is as follows:

Donor and CRISPR/Cas9 System

Wild-type allele

Conditional KO allele

KO allele



 Cas9/sgRNA     Uncoding region     Coding region     LoxP

# Technical routes

- The *Wars2* gene has 5 transcripts. According to the structure of *Wars2* gene, exon2-exon4 of *Wars2*-201 (ENSMUST00000004343.6) transcript is recommended as the knockout region. The region contains 425bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Wars2* gene. The brief process is as follows: sgRNA was transcribed in vitro, donor vector was constructed. Cas9, sgRNA 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 sequencing. A stable F1 generation mouse model was obtained by mating positive F0 generation mice with C57BL/6JGpt mice.
- The flox mice was knocked out after mating with mice expressing Cre recombinase, resulting in the loss of function of the target gene in specific tissues or cell types.

- According to the existing MGI data , Mice homozygous for an ENU-induced mutation exhibit decreased body fat mass, cardiomyopathy, and progressive hearing loss.
- The insertion position of the 3rd loxp is close to the 5th end of the Gm42717 gene, and the insertion of loxp may affect the regulation of the 5th end of the Gm42717 gene.
- The *Wars2* gene is located on the Chr3. 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

# Gene information ( NCBI )

## Wars2 tryptophanyl tRNA synthetase 2 (mitochondrial) [ *Mus musculus* (house mouse) ]

Gene ID: 70560, updated on 9-Sep-2018

### Summary

**Official Symbol** Wars2 provided by [MGI](#)

**Official Full Name** tryptophanyl tRNA synthetase 2 (mitochondrial) provided by [MGI](#)

**Primary source** [MGI:MGI:1917810](#)

**See related** [Ensembl:ENSMUSG000000004233](#) [Vega:OTTMUSG000000006862](#)

**Gene type** protein coding

**RefSeq status** PROVISIONAL

**Organism** [Mus musculus](#)

**Lineage** Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus

**Also known as** TrpRS; AI413375; 5730427B17Rik; 9430020O07Rik

**Expression** Ubiquitous expression in limb E14.5 (RPKM 1.9), CNS E11.5 (RPKM 1.5) and 28 other tissues [See more](#)

**Orthologs** [human](#) [all](#)

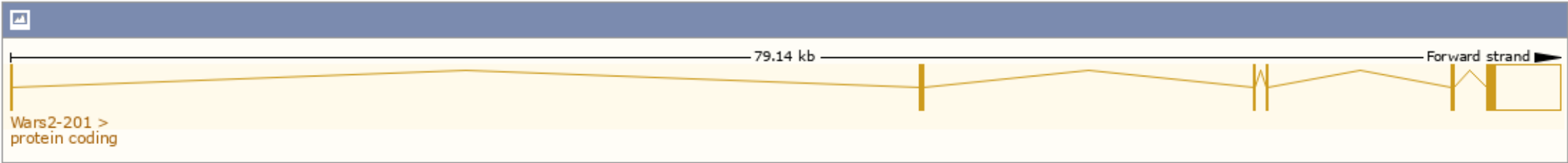


# Transcript information ( Ensembl )

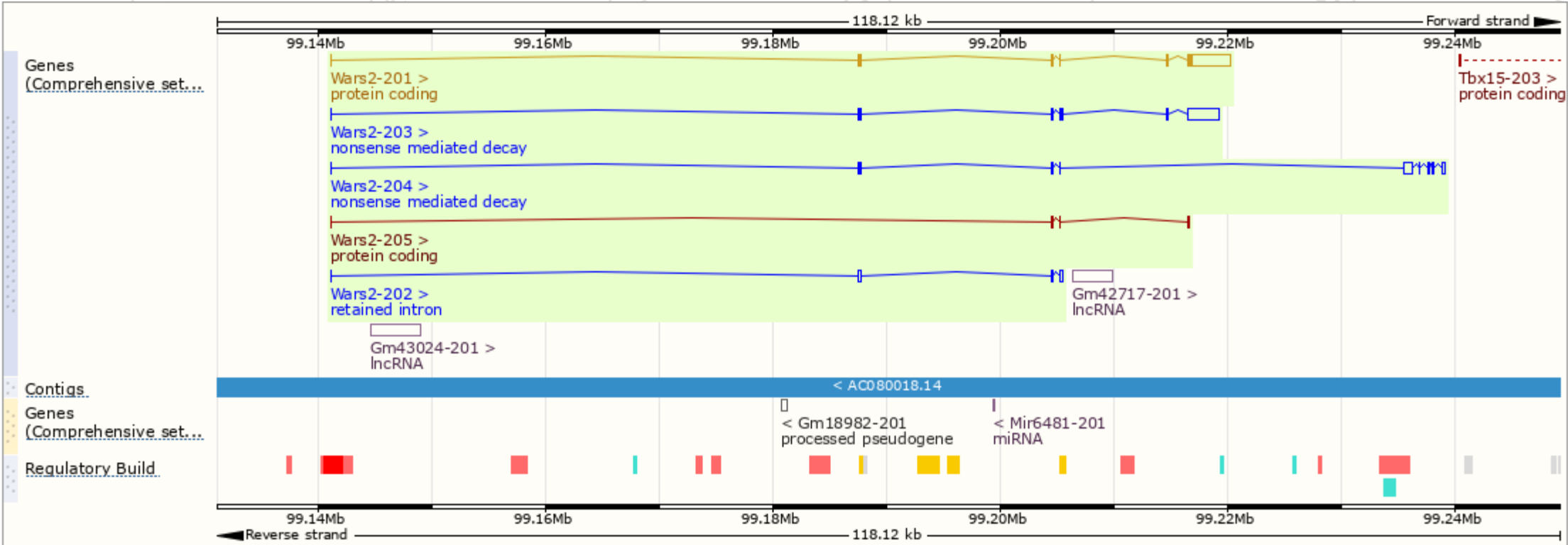
The gene has 5 transcripts, and all transcripts are shown below:

Show/hide columns (1 hidden)								Filter	
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	RefSeq	Flags	
Wars2-201	<a href="#">ENSMUST00000004343.6</a>	4410	<a href="#">360aa</a>	Protein coding	<a href="#">CCDS17672</a>	<a href="#">Q9CYK1</a>	<a href="#">NM_027462</a> <a href="#">NP_081738</a>	TSL:1	GENCODE basic APPRIS P1
Wars2-205	<a href="#">ENSMUST00000198044.1</a>	403	<a href="#">106aa</a>	Protein coding	-	<a href="#">A0A0G2JDG7</a>	-	TSL:3	GENCODE basic
Wars2-203	<a href="#">ENSMUST00000135960.7</a>	3457	<a href="#">175aa</a>	Nonsense mediated decay	-	<a href="#">A0A0G2JDR5</a>	-	TSL:1	
Wars2-204	<a href="#">ENSMUST00000145650.7</a>	1840	<a href="#">188aa</a>	Nonsense mediated decay	-	<a href="#">Q8BZQ9</a>	-	TSL:1	
Wars2-202	<a href="#">ENSMUST00000126875.1</a>	666	No protein	Retained intron	-	-	-	TSL:3	

The strategy is based on the design of Wars2-201 transcript, The transcription is shown below

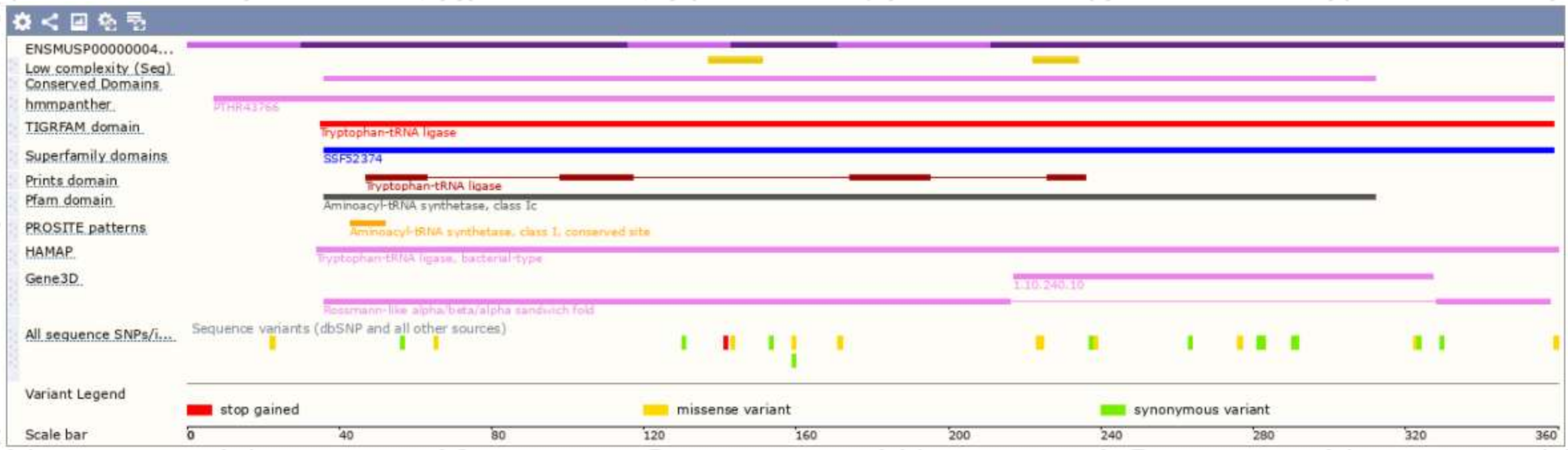


# Genomic location distribution





# 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 mutant mice are viable and fertile, but differ from wild-type with respect to interleukin 12 mediated T cell function.

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