

# *Il4ra* Cas9-KO Strategy

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# Project Overview



**Project Name**

***Il4ra***

**Project type**

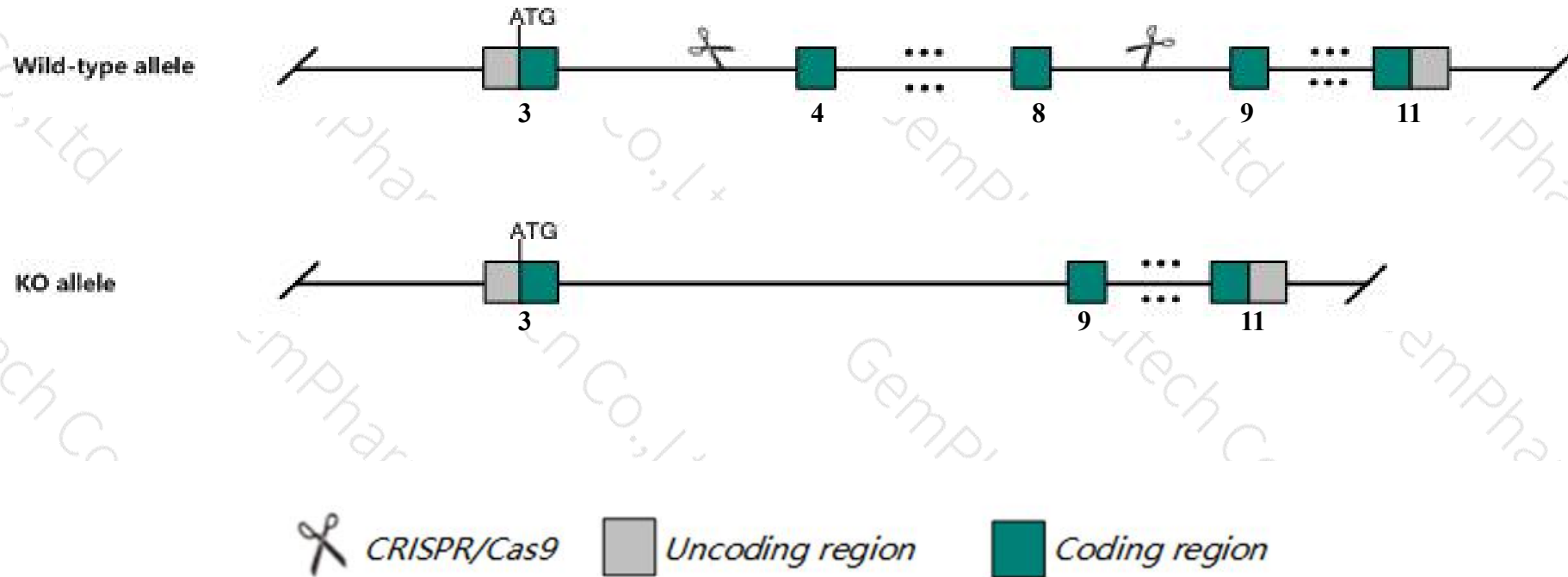
**Cas9-KO**

**Strain background**

**C57BL/6JGpt**

# Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Il4ra* gene. The schematic diagram is as follows:



- The *Il4ra* gene has 5 transcripts. According to the structure of *Il4ra* gene, exon4-exon8 of *Il4ra-201* (ENSMUST00000033004.7) transcript is recommended as the knockout region. The region contains 703bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Il4ra* gene. The brief process is as follows: CRISPR/Cas9 system v

- According to the existing MGI data, Nullizygous mice exhibit reduced T helper 2 cell response to *N. brasiliensis* infection. Homozygotes for a null allele also display severe susceptibility to *S. mansoni* infection, enhanced carcinogen-induced intestinal tumour initiation, and altered control of chronic *Leishmania major* infection.
- The strategy knockout region contains Gm44876 lncRNA gene, which also destroys Gm44876 lncRNA gene.
- The *Il4ra* gene is located on the Chr7. 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)

## Il4ra interleukin 4 receptor, alpha [Mus musculus (house mouse)]

Gene ID: 16190, updated on 12-Mar-2019

### Summary



<b>Official Symbol</b>	Il4ra provided by <a href="#">MGI</a>
<b>Official Full Name</b>	interleukin 4 receptor, alpha provided by <a href="#">MGI</a>
<b>Primary source</b>	<a href="#">MGI:MGI:105367</a>
<b>See related</b>	<a href="#">Ensembl:ENSMUSG00000030748</a>
<b>Gene type</b>	protein coding
<b>RefSeq status</b>	VALIDATED
<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>	CD124, Il4r
<b>Expression</b>	Broad expression in thymus adult (RPKM 39.6), adrenal adult (RPKM 36.7) and 18 other tissues <a href="#">See more</a>
<b>Orthologs</b>	<a href="#">human</a> <a href="#">all</a>

# Transcript information (Ensembl)

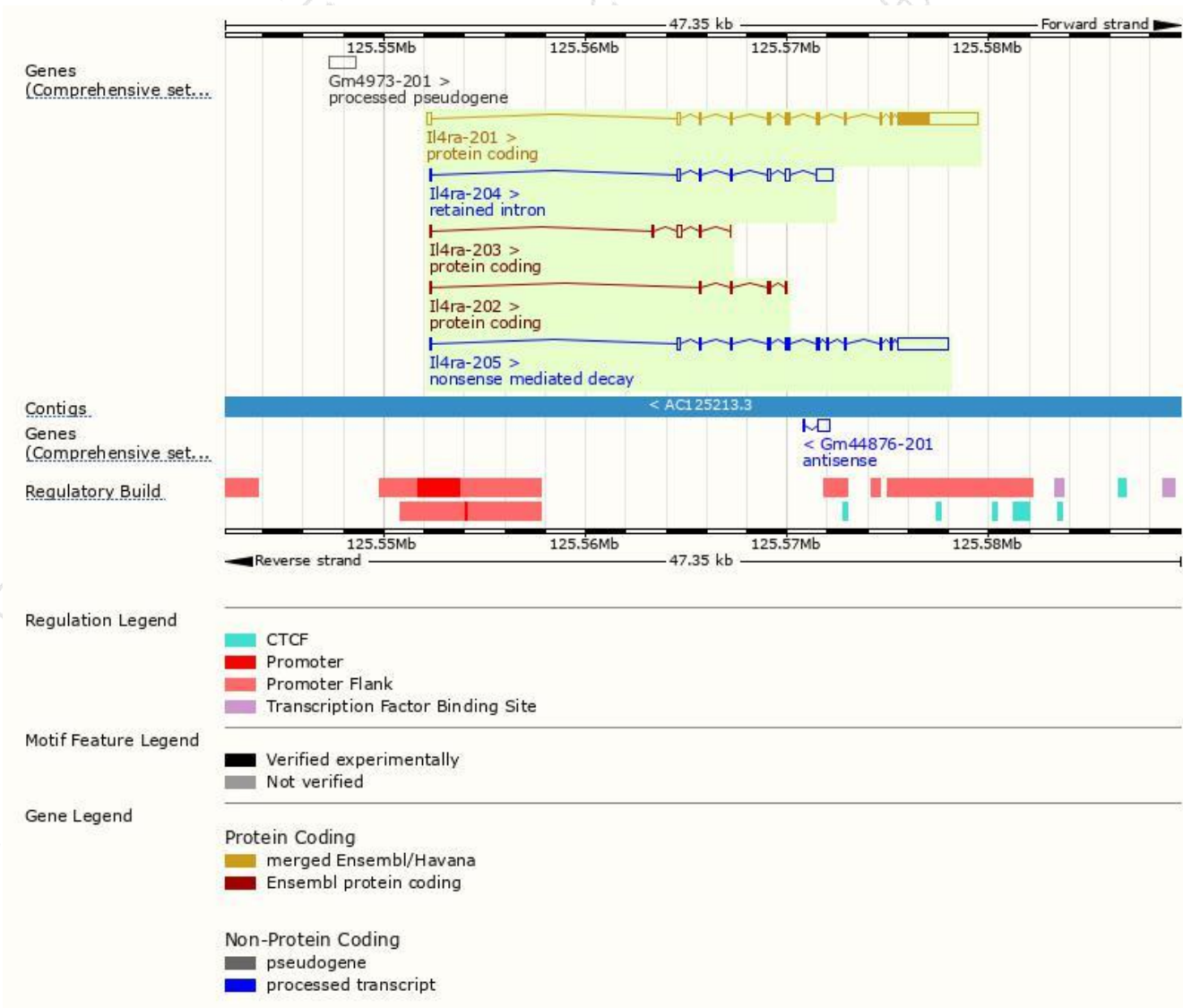
The gene has 5 transcripts, all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
<b>Il4ra-201</b>	<a href="#">ENSMUST00000033004.7</a>	5256	<a href="#">810aa</a>	Protein coding	<a href="#">CCDS40121</a>	<a href="#">P16382 Q3U905</a>	TSL:1 GENCODE basic APPRIS P1
<b>Il4ra-202</b>	<a href="#">ENSMUST00000205985.1</a>	491	<a href="#">140aa</a>	Protein coding	-	<a href="#">A0A0U1RNW1</a>	CDS 3' incomplete TSL:3
<b>Il4ra-203</b>	<a href="#">ENSMUST00000206217.1</a>	434	<a href="#">42aa</a>	Protein coding	-	<a href="#">A0A0U1RPZ6</a>	CDS 3' incomplete TSL:2
<b>Il4ra-205</b>	<a href="#">ENSMUST00000206846.1</a>	3696	<a href="#">230aa</a>	Nonsense mediated decay	-	<a href="#">P16382</a>	TSL:1
<b>Il4ra-204</b>	<a href="#">ENSMUST00000206681.1</a>	1615	No protein	Retained intron	-	-	TSL:1

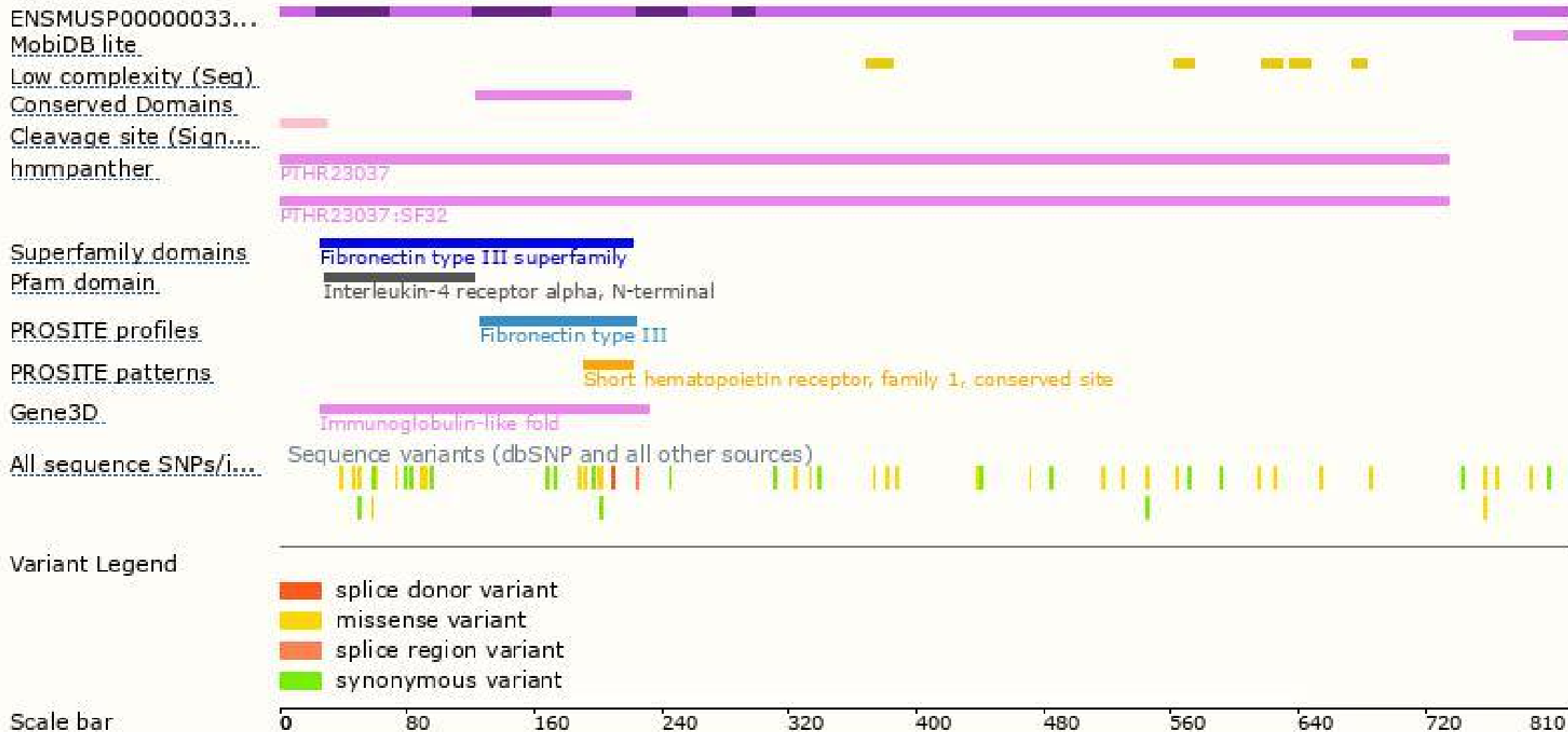
The strategy is based on the design of *Il4ra-201* transcript, The transcription is shown below



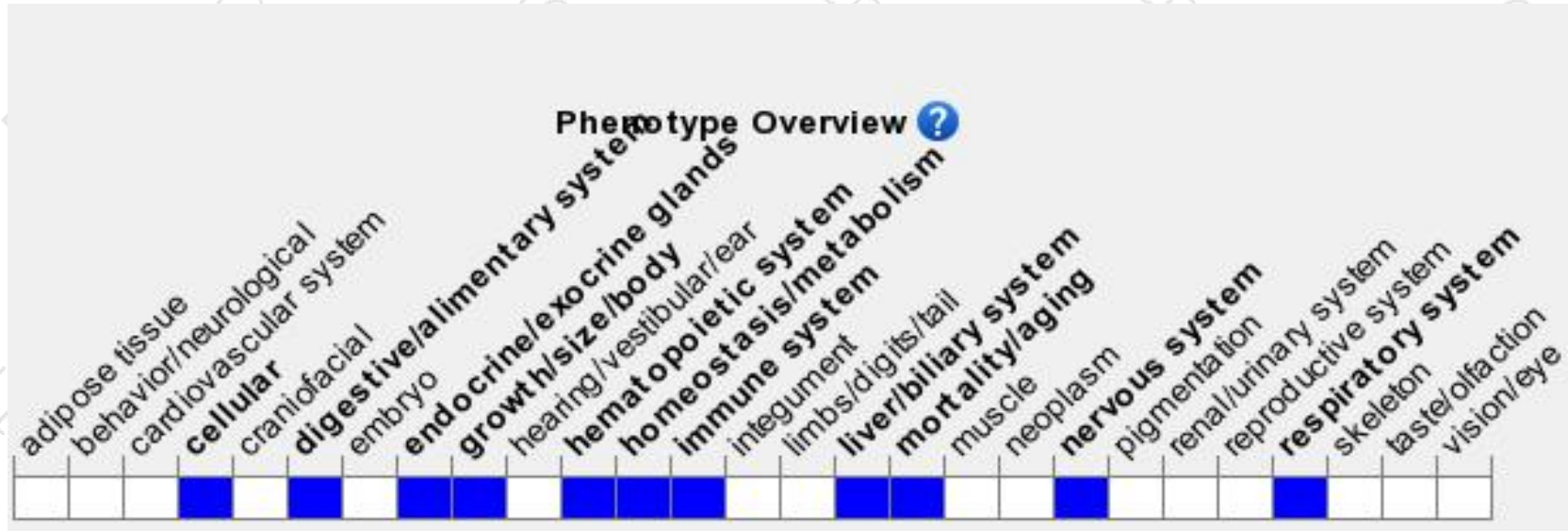
# Genomic location distribution



# 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, Nullizygous mice exhibit reduced T helper 2 cell response to *N. brasiliensis* infection. Homozygotes for a null allele also display severe susceptibility to *S. mansoni* infection, enhanced carcinogen-induced intestinal tumour initiation, and altered control of chronic *Leishmania major* infection.

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

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