

I15ra Cas9-CKO Strategy

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Overview

Target Gene Name

- Il5ra

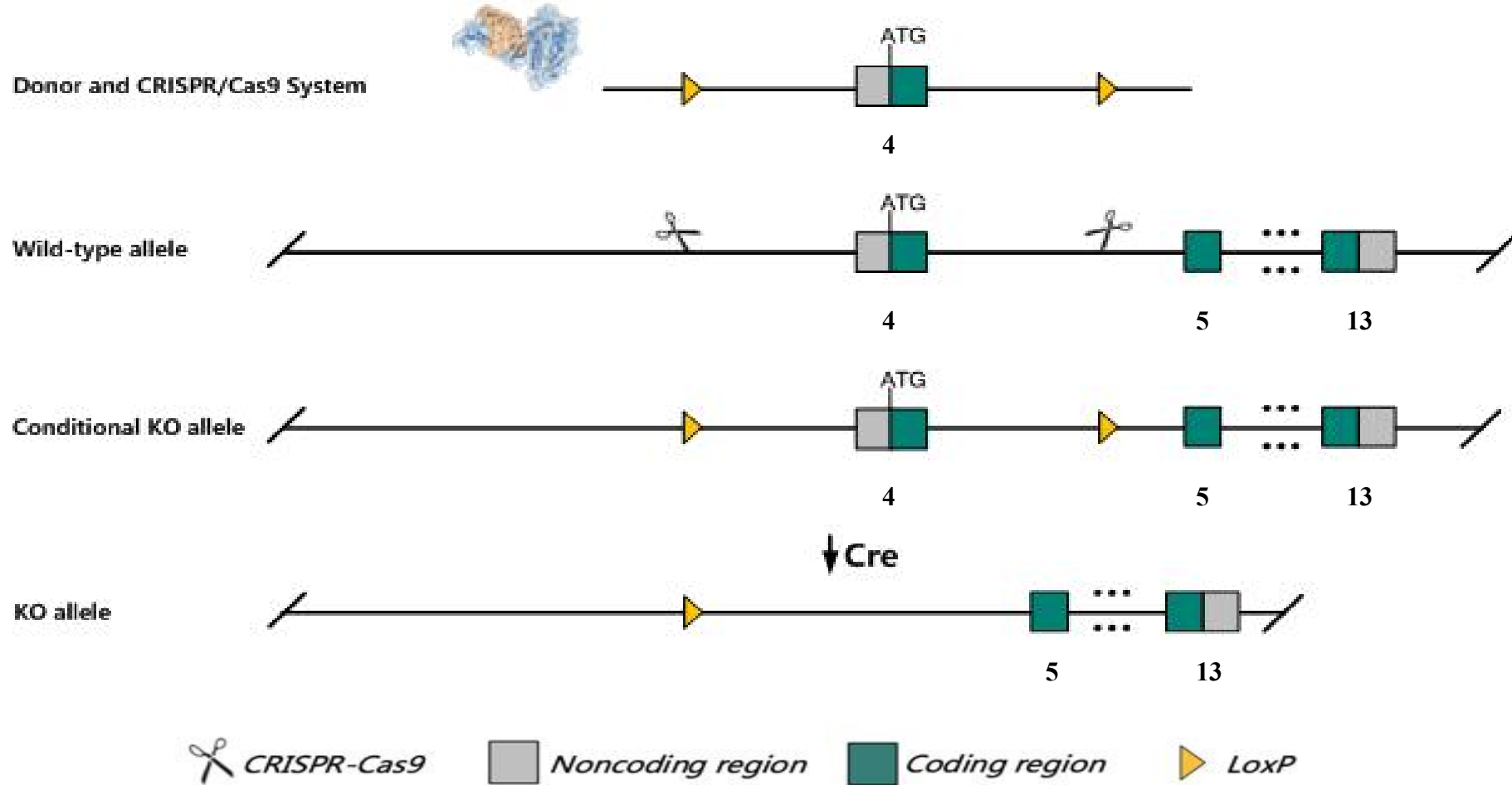
Project Type

- Cas9-CKO

Genetic Background

- C57BL/6JGpt

Strain Strategy



Schematic representation of CRISPR-Cas9 engineering used to edit the *Il5ra* gene.

Technical Information

- The *Il5ra* gene has 3 transcripts. According to the structure of *Il5ra* gene, exon4 of *Il5ra*-202 (ENSMUST00000204659.3) transcript is recommended as the knockout region. The region contains start codon ATG. Knocking out the region will result in disruption of protein function.
- In this project we use CRISPR-Cas9 technology to modify *Il5ra* gene. The brief process is as follows: CRISPR-Cas9 system 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 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.
- The flox mice will be knocked out after mating with mice expressing Cre recombinase, resulting in the loss of function of the target gene in specific tissues and cell types.

Gene Information

Il5ra interleukin 5 receptor, alpha [*Mus musculus* (house mouse)]

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Gene ID: 16192, updated on 16-Oct-2024

Summary

Official Symbol	Il5ra provided by MGI
Official Full Name	interleukin 5 receptor, alpha provided by MGI
Primary source	MGI:MGI:96558
See related	Ensembl:ENSMUSG00000005364 AllianceGenome:MGI:96558
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	Il5r; CD125; CDw125
Summary	Predicted to enable cytokine binding activity and cytokine receptor activity. Acts upstream of or within cellular response to organic substance; inflammatory response to antigenic stimulus; and regulation of interleukin-5 production. Predicted to be located in membrane. Predicted to be integral component of membrane. Predicted to be part of receptor complex. Predicted to be active in external side of plasma membrane. Is expressed in early conceptus. Human ortholog(s) of this gene implicated in asthma. Orthologous to human IL5RA (interleukin 5 receptor subunit alpha). [provided by Alliance of Genome Resources, Apr 2022]
Expression	Low expression observed in reference dataset See more
Orthologs	human all
NEW	Try the new Gene table Try the new Transcript table

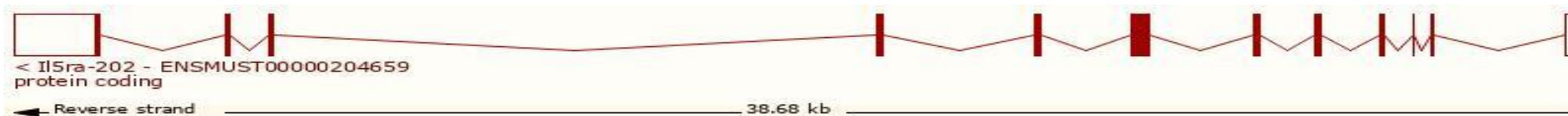
Source: <https://www.ncbi.nlm.nih.gov/>

Transcript Information

The gene has 3 transcripts, all transcripts are shown below:

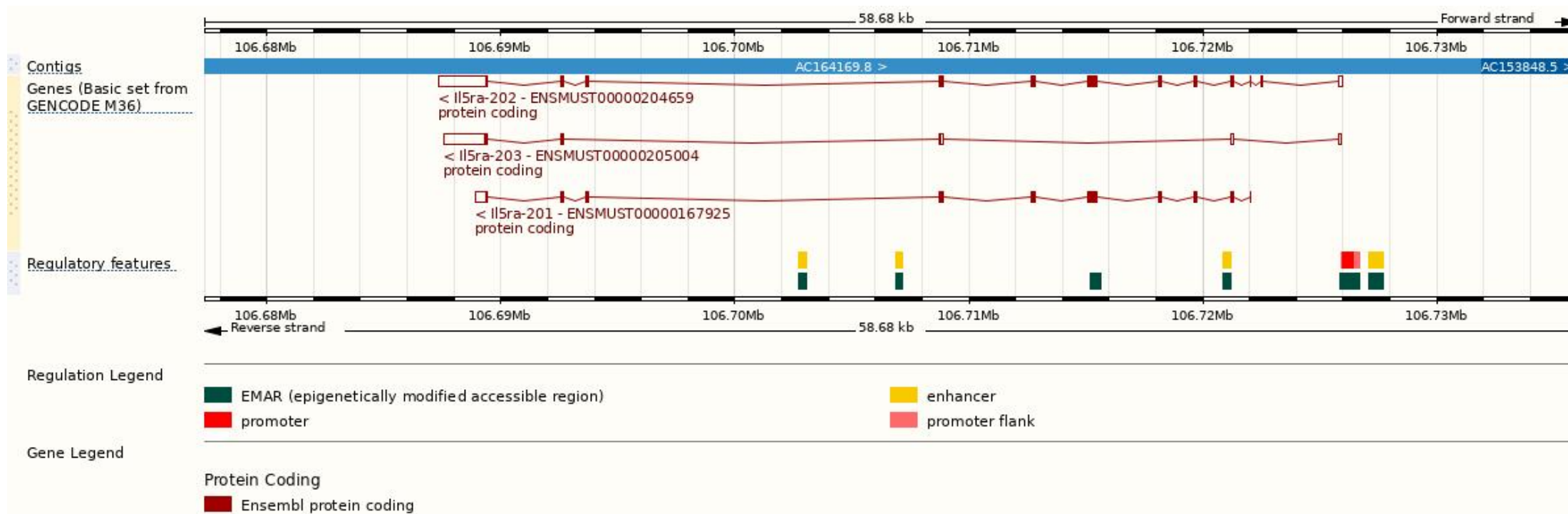
Transcript ID	Name	bp	Protein	Biotype	CCDS	UniProt Match	Flags
ENSMUST00000204659.3	<i>Il5ra-202</i>	3575	415aa	Protein coding	CCDS20396	P21183 Q05A81	Ensembl Canonical GENCODE Basic APPRIS P1 TSL:1
ENSMUST00000205004.2	<i>Il5ra-203</i>	2271	76aa	Protein coding		A0A0N4SUU4	GENCODE Basic TSL:1
ENSMUST00000167925.3	<i>Il5ra-201</i>	1704	415aa	Protein coding	CCDS20396	P21183 Q05A81	GENCODE Basic APPRIS P1 TSL:5

The strategy is based on the design of *Il5ra-202* transcript, the transcription is shown below:

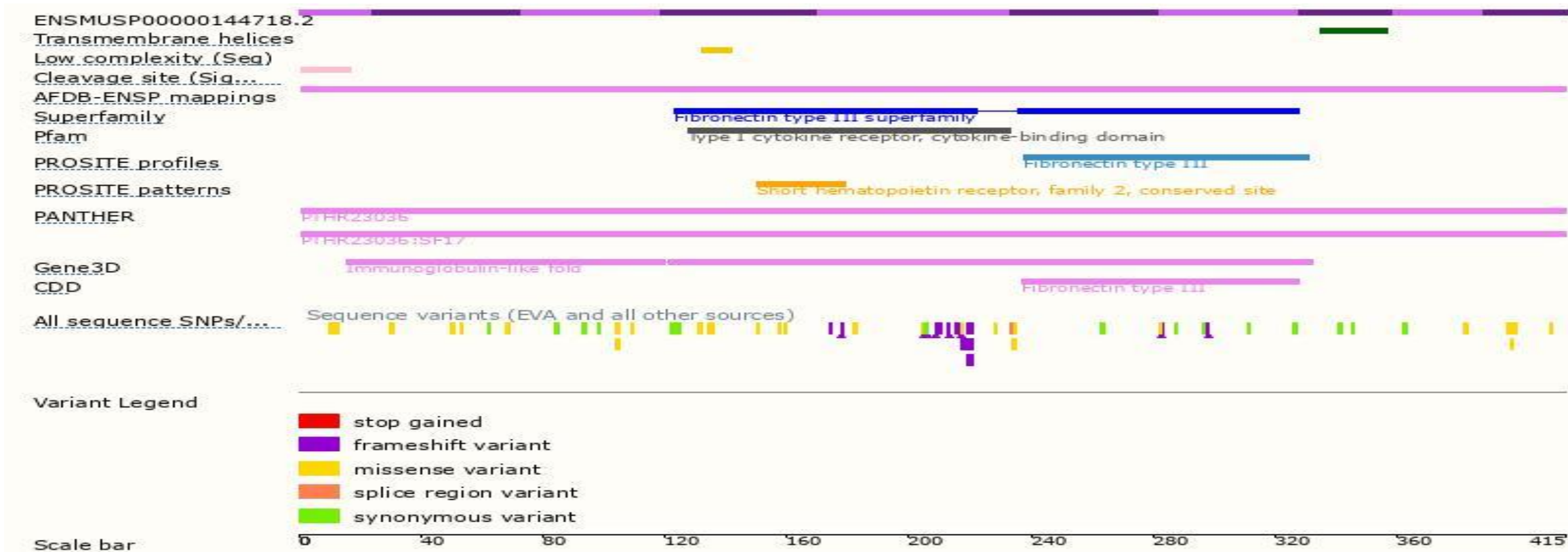


Source: <https://www.ensembl.org>

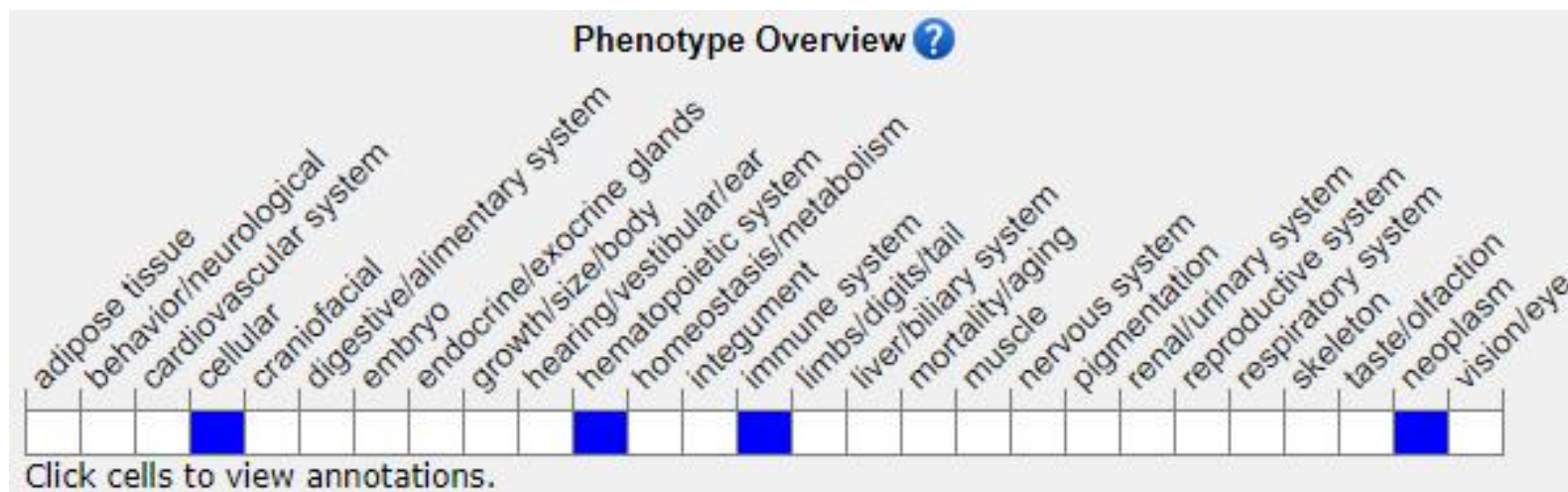
Genomic Information



Protein Information



Mouse Phenotype Information (MGI)

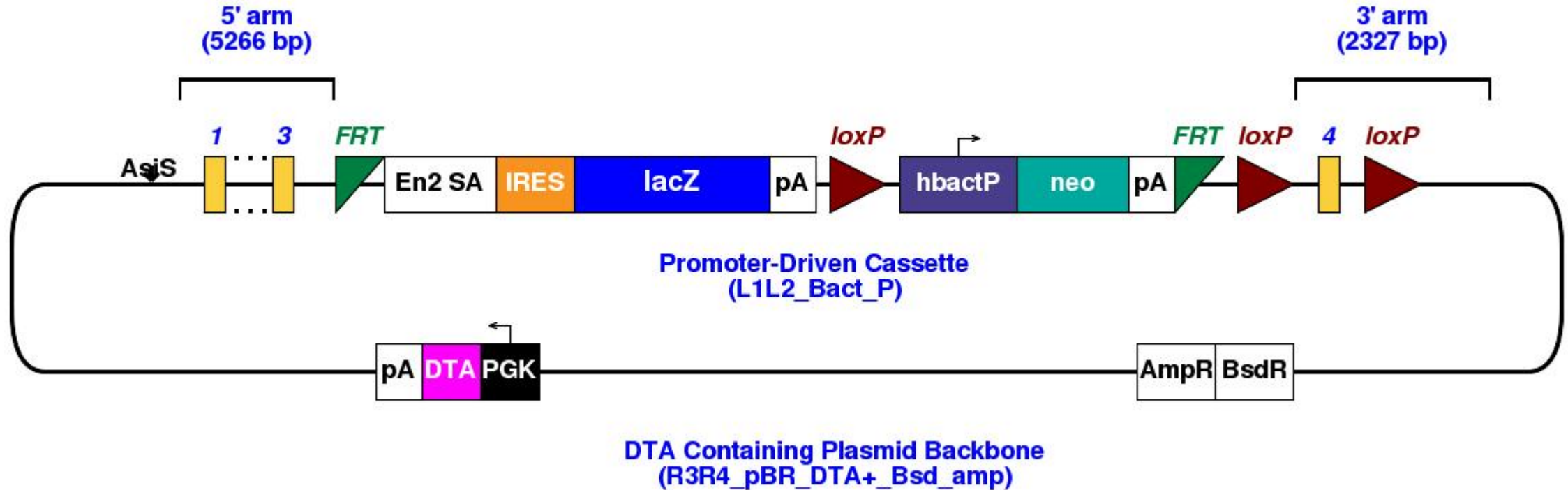


- Mice homozygous for disruptions in this gene display a generally normal phenotype but with some immune system deficiencies. Mice homozygous for one knock-out allele exhibit increased metastasis of injected B16F10 melanoma cells.

Important Information

- *Il5ra* is located on Chr6. 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 risk of loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.
- Transcript *Il5ra-203* may not be affected.
- The CKO region contains start codon ATG, it maybe form an new start codon ATG and translate unknown proteins.

Reference



<https://www.mousephenotype.org/data/genes/MGI:96558>