Vsir Cas9-CKO Strategy

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Overview

Target Gene Name

- Vsir

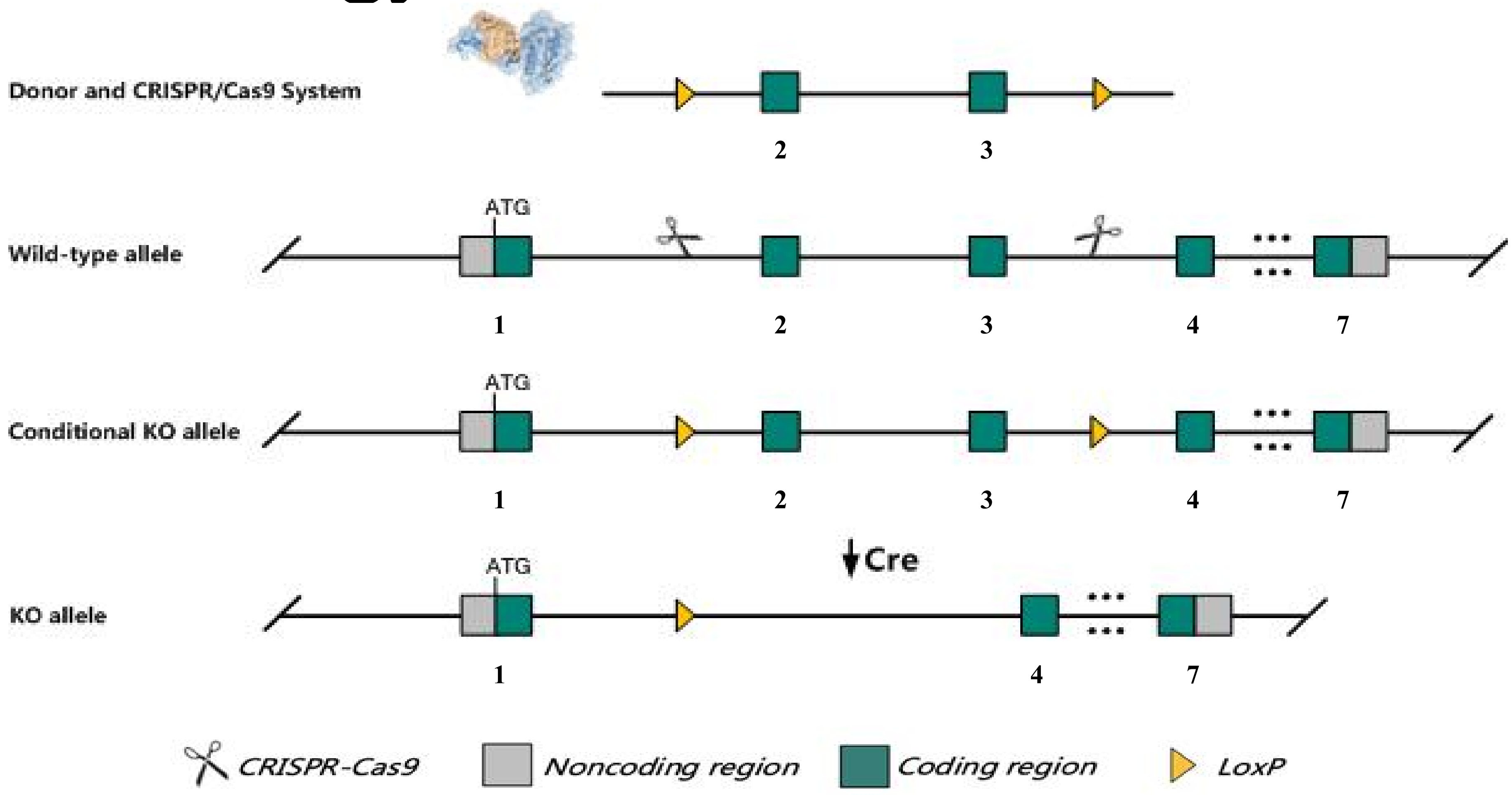
Project Type

- Cas9-CKO

Genetic Background

- C57BL/6JGpt

Strain Strategy



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

Technical Information

- The *Vsir* gene has 7 transcripts. According to the structure of *Vsir* gene, exon2-exon3 of *Vsir*-201 (ENSMUST00000020301.14) transcript is recommended as the knockout region. The region contains 477bp coding sequence. Knocking out the region will result in disruption of protein function.
- In this project we use CRISPR-Cas9 technology to modify *Vsir* 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

Vsir V-set immunoregulatory receptor [*Mus musculus* (house mouse)]

Download Datasets

Gene ID: 74048, updated on 2-Sep-2025

Summary

Official Symbol	Vsir provided by MGI
Official Full Name	V-set immunoregulatory receptor provided by MGI
Primary source	MGI:MGI:1921298
See related	Ensembl:ENSMUSG00000020101 AllianceGenome:MGI:1921298
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	Dies1; PD-1H; VISTA; 4632428N05Rik
Summary	Predicted to enable endopeptidase activator activity; enzyme binding activity; and identical protein binding activity. Acts upstream of or within several processes, including negative regulation of CD4-positive, alpha-beta T cell proliferation; negative regulation of T cell cytokine production; and positive regulation of BMP signaling pathway. Located in external side of plasma membrane. Is expressed in several structures, including immune system; liver; lung; male reproductive gland or organ; and small intestine lamina propria. Orthologous to human VSIR (V-set immunoregulatory receptor). [provided by Alliance of Genome Resources, Jul 2025]
Expression	Broad expression in spleen adult (RPKM 21.5), mammary gland adult (RPKM 18.6) and 21 other tissues See more
Orthologs	human all

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

Transcript Information

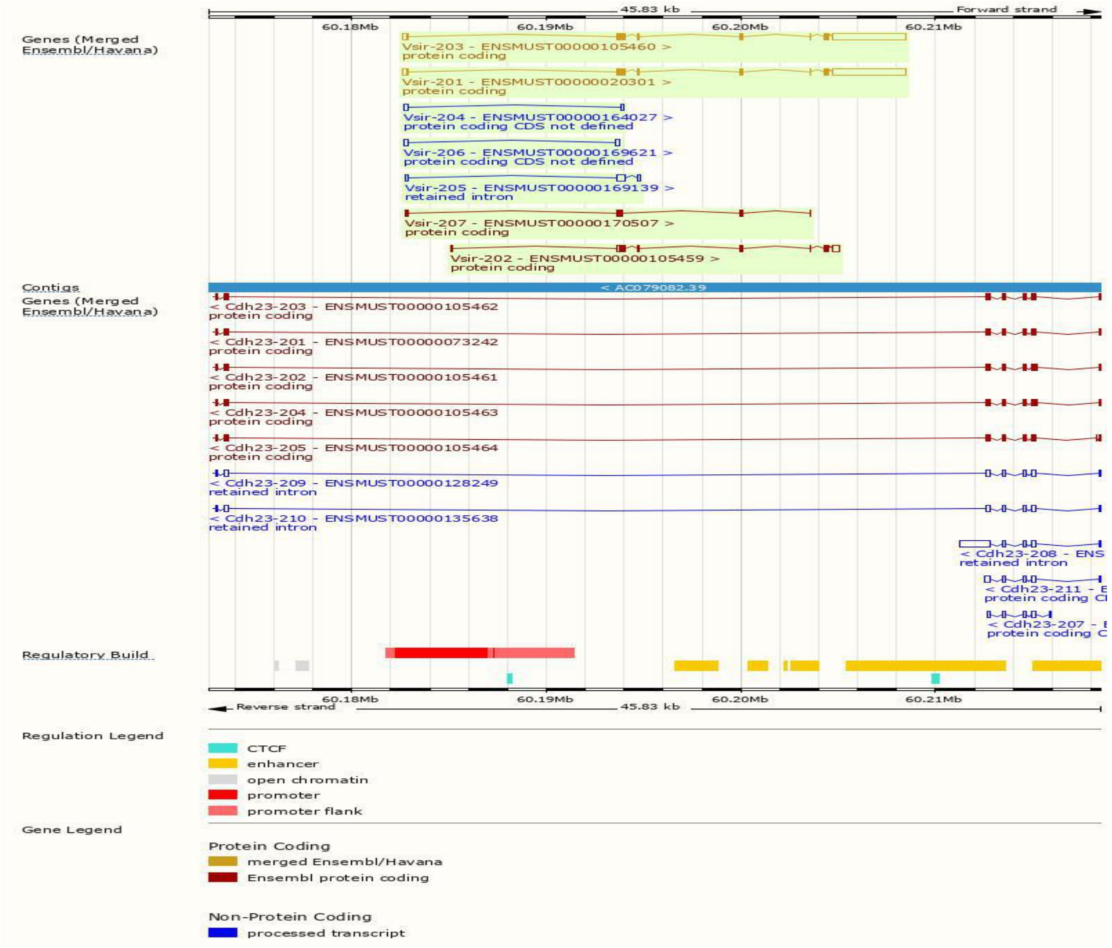
The gene has 7 transcripts,all transcripts are shown below:

Transcript ID	Name	bp	Protein	Biotype	CCDS	UniProt Match	Flags
ENSMUST00000020301.14	Vsir-201	4846	309aa	Protein coding	CCDS35912	A0A171EBK7	Ensembl Canonical, GENCODE Primary, GENCODE Basic, APPRIS P4, TSL:1
ENSMUST00000105460.8	Vsir-203	4843	308aa	Protein coding	CCDS48569	Q9D659	GENCODE Basic, APPRIS ALT1, TSL:1
ENSMUST00000105459.2	Vsir-202	1290	227aa	Protein coding		D3Z7B7	GENCODE Basic, TSL:5
ENSMUST00000170507.8	Vsir-207	497	162aa	Protein coding		E9Q251	TSL:5, CDS 3' incomplete
ENSMUST00000169621.2	Vsir-206	387	No protein	Protein coding CDS not defined		-	TSL:3
ENSMUST00000164027.2	Vsir-204	371	No protein	Protein coding CDS not defined		-	TSL:3
ENSMUST00000169139.2	Vsir-205	641	No protein	Retained intron		-	TSL:2

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

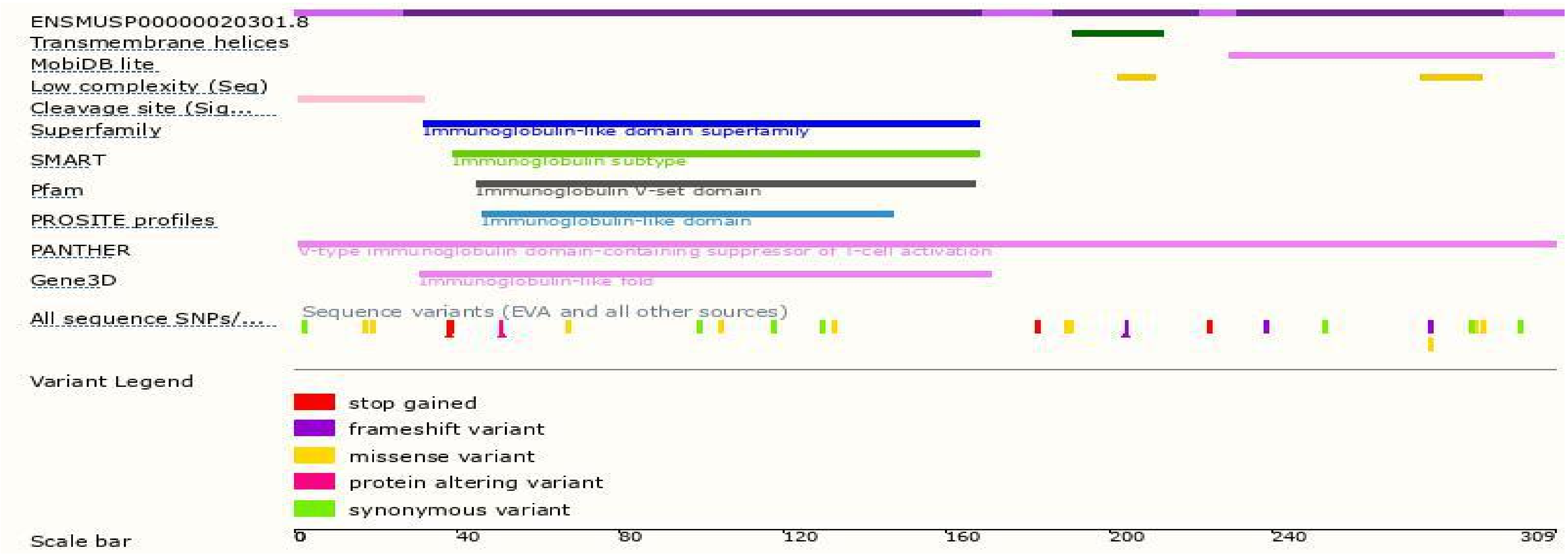
Source: https://www.ensembl.org

Genomic Information



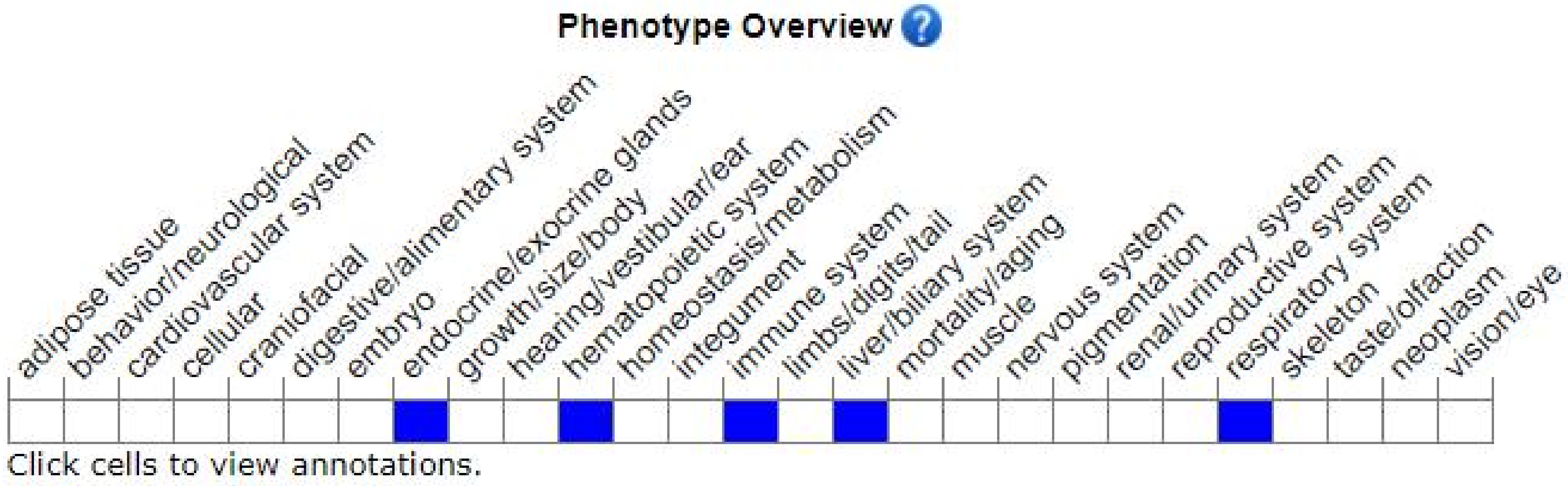
Source: : https://www.ensembl.org

Protein Information



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

Mouse Phenotype Information (MGI)



- Mice homozygous for a knock-out allele exhibit increased leukocyte infiltration and T cell activation.

Important Information

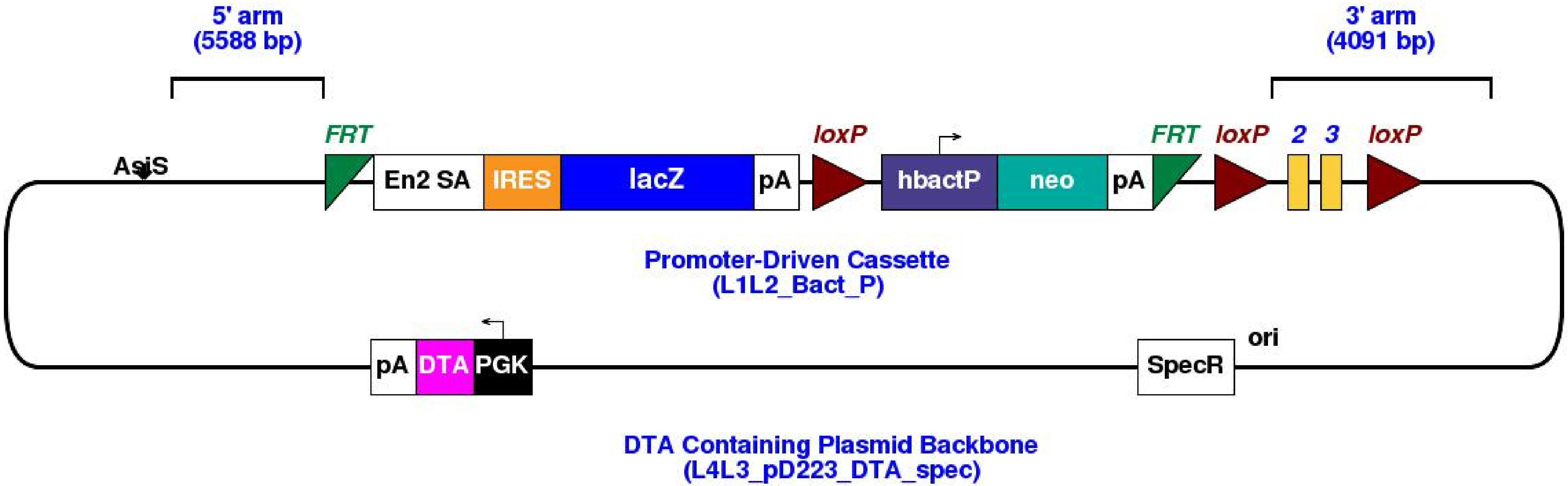
- *Vsir* is located on Chr10. If the knockout mice are crossed with other mouse strains to obtain double homozygous mutant offspring, please avoid the situation that the second gene is on the same chromosome.
- The flox region deletes some of the coding sequence, but does not result in frameshift.
- Knockout the region may affect its function of *Cdh23* gene.
- 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.

References

Allele Type:	Targeted (Conditional ready, No functional change)
Mutation:	Insertion
	Mutation details: A loxP site was inserted upstream of exon 2. An FRT- and loxP-site was inserted downstream of exon 3. Flp-mediated recombination removed the selection cassette and left exon 2 and 3 floxed. (*J:223648*)

https://www.informatics.jax.org/allele/MGI:5796190

References



https://www.mousephenotype.org/data/alleles/MGI:1921298/tm100688(L1L2_Bact_P)?alleleSymbol=tm100688(L1L2_Bact_P)#targetingVector