

# ***Hivep3 Cas9-KO Strategy***

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**Reviewer :**

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# Project Overview

**Project Name**

***Hivep3***

**Project type**

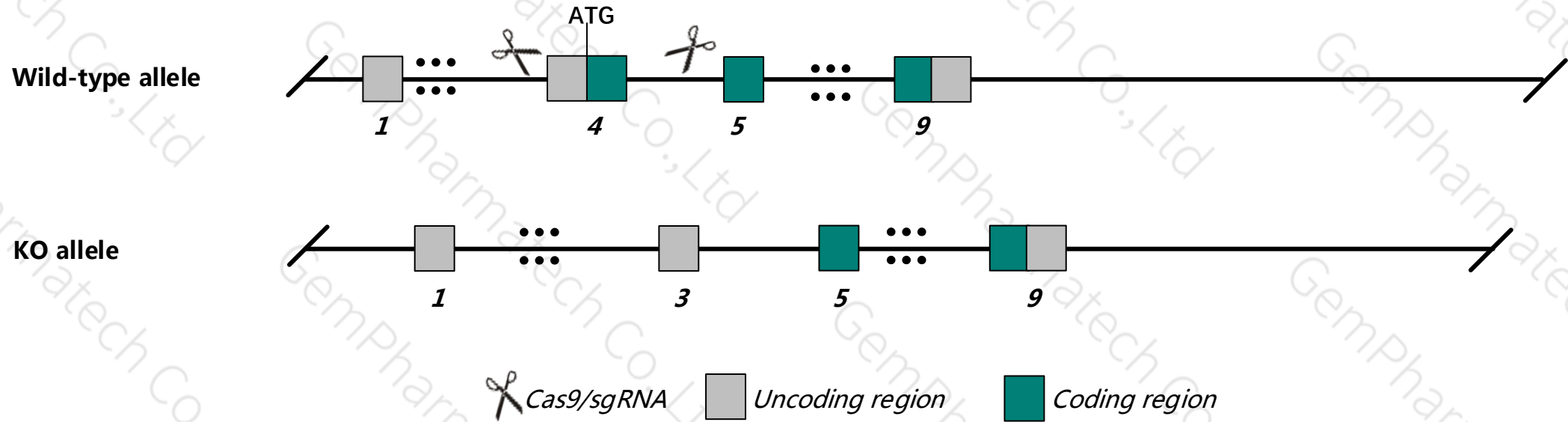
**Cas9-KO**

**Strain background**

**C57BL/6JGpt**

# Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Hivep3* gene. The schematic diagram is as follows:



# Technical routes

- The *Hivep3* gene has 10 transcripts. According to the structure of *Hivep3* gene, exon4 of *Hivep3*-202 ( ENSMUST00000106307.8) transcript is recommended as the knockout region. The region contains start codon ATG. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Hivep3* gene. The brief process is as follows: sgRNA was transcribed in vitro. Cas9, sgRNA 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.

- According to the existing MGI data , Homozygous mutation of this gene results in diminished IL-2 production by stimulated CD4 cells. Mice homozygous for a knock-out allele exhibit increased bone volume.
- The KO region contains functional region of the *AL607142.1* gene. Knockout the region may affect the function of *AL607142.1* gene.
- The *Hivep3* gene is located on the Chr4. 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 )

## Hivep3 human immunodeficiency virus type I enhancer binding protein 3 [ *Mus musculus* (house mouse) ]

Gene ID: 16656, updated on 27-Feb-2020

### Summary

Official Symbol	Hivep3 provided by <a href="#">MGI</a>
Official Full Name	human immunodeficiency virus type I enhancer binding protein 3 provided by <a href="#">MGI</a>
Primary source	<a href="#">MGI:MGI:106589</a>
See related	<a href="#">Ensembl:ENSMUSG00000028634</a>
Gene type	protein coding
RefSeq status	VALIDATED
Organism	<a href="#">Mus musculus</a>
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Rc; Krc; KBP1; Shn3; Zas3; KBP-1; AI848000; A130075N07; Schnurri-3; 2900056N03Rik; E030045D18Rik
Expression	Broad expression in thymus adult (RPKM 3.7), cortex adult (RPKM 2.0) and 16 other tissues <a href="#">See more</a>
Orthologs	<a href="#">human</a> <a href="#">all</a>

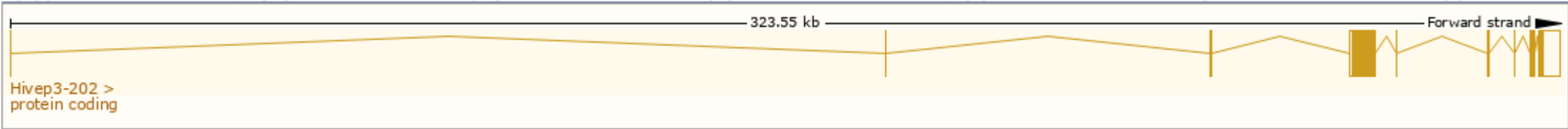


# Transcript information ( Ensembl )

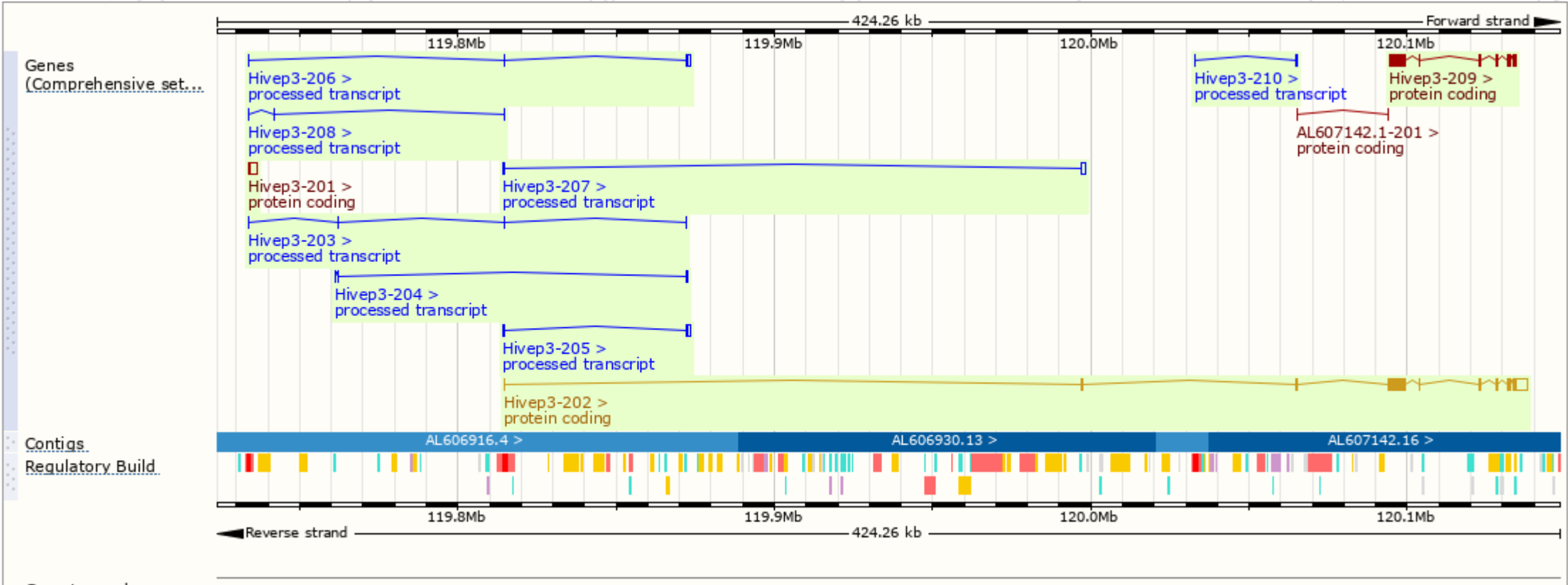
The gene has 10 transcripts, and all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Hivep3-202	<a href="#">ENSMUST00000106307.8</a>	11838	<a href="#">2348aa</a>	Protein coding	<a href="#">CCDS38863</a>	<a href="#">A2A884</a>	TSL:1 GENCODE basic APPRIS P1
Hivep3-209	<a href="#">ENSMUST00000166542.2</a>	7253	<a href="#">2348aa</a>	Protein coding	<a href="#">CCDS38863</a>	<a href="#">A2A884</a>	TSL:1 GENCODE basic APPRIS P1
Hivep3-201	<a href="#">ENSMUST00000084306.4</a>	2973	<a href="#">116aa</a>	Protein coding	-	<a href="#">F7D7H6</a>	TSL:NA GENCODE basic
Hivep3-207	<a href="#">ENSMUST00000143837.1</a>	1719	No protein	Processed transcript	-	-	TSL:1
Hivep3-205	<a href="#">ENSMUST00000136547.1</a>	1359	No protein	Processed transcript	-	-	TSL:1
Hivep3-206	<a href="#">ENSMUST00000141605.7</a>	1115	No protein	Processed transcript	-	-	TSL:1
Hivep3-204	<a href="#">ENSMUST00000125069.7</a>	520	No protein	Processed transcript	-	-	TSL:1
Hivep3-203	<a href="#">ENSMUST00000123698.7</a>	500	No protein	Processed transcript	-	-	TSL:5
Hivep3-210	<a href="#">ENSMUST00000227491.1</a>	397	No protein	Processed transcript	-	-	-
Hivep3-208	<a href="#">ENSMUST00000144907.7</a>	270	No protein	Processed transcript	-	-	TSL:1

The strategy is based on the design of *Hivep3-202* transcript, The transcription is shown below

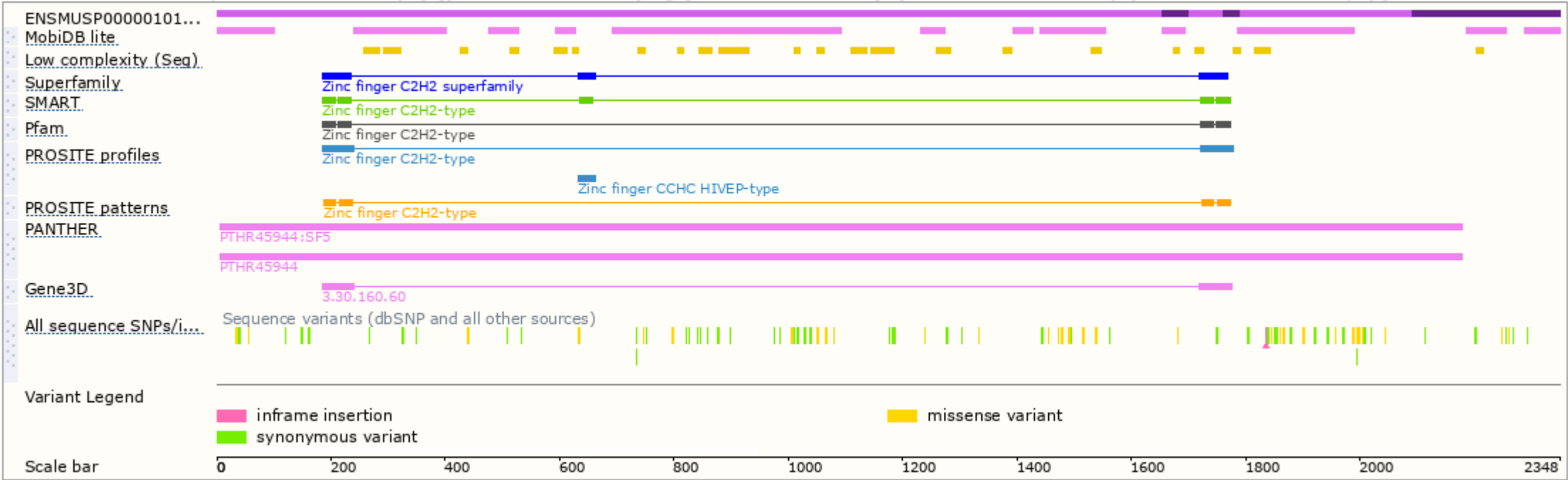


# Genomic location distribution

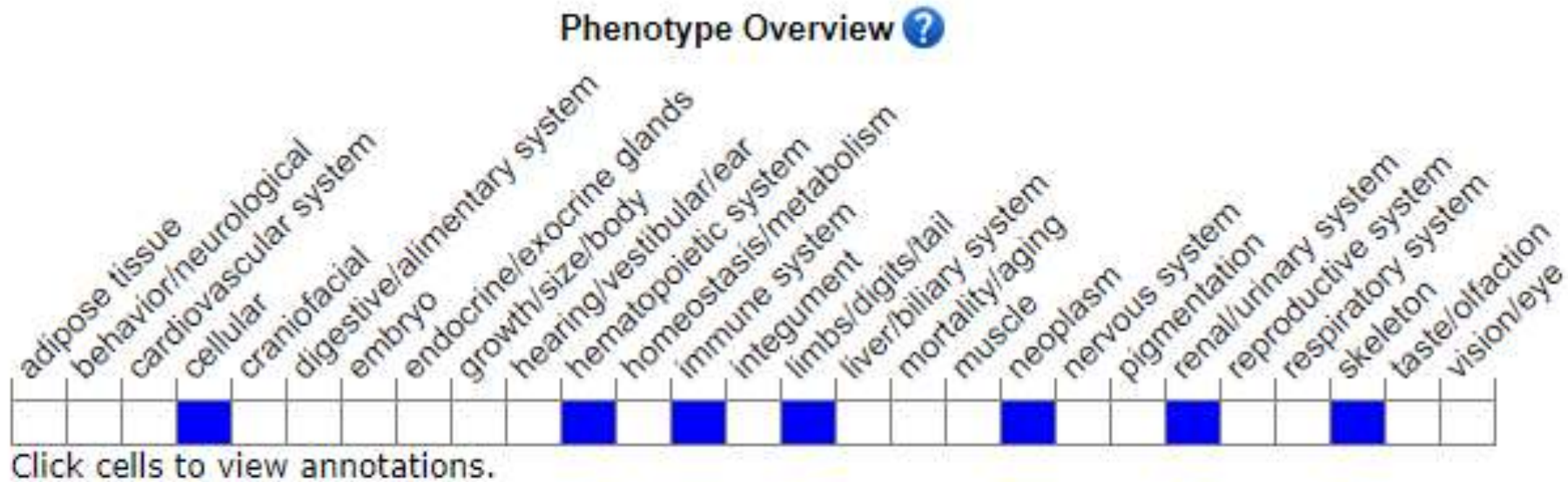




# Protein domain



# 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 mutation of this gene results in diminished IL-2 production by stimulated CD4 cells. Mice homozygous for a knock-out allele exhibit increased bone volume.

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