

Hpgds Cas9-CKO Strategy

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Reviewer:

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Design Date:

2020-2-7

Project Overview

Project Name

Hpgds

Project type

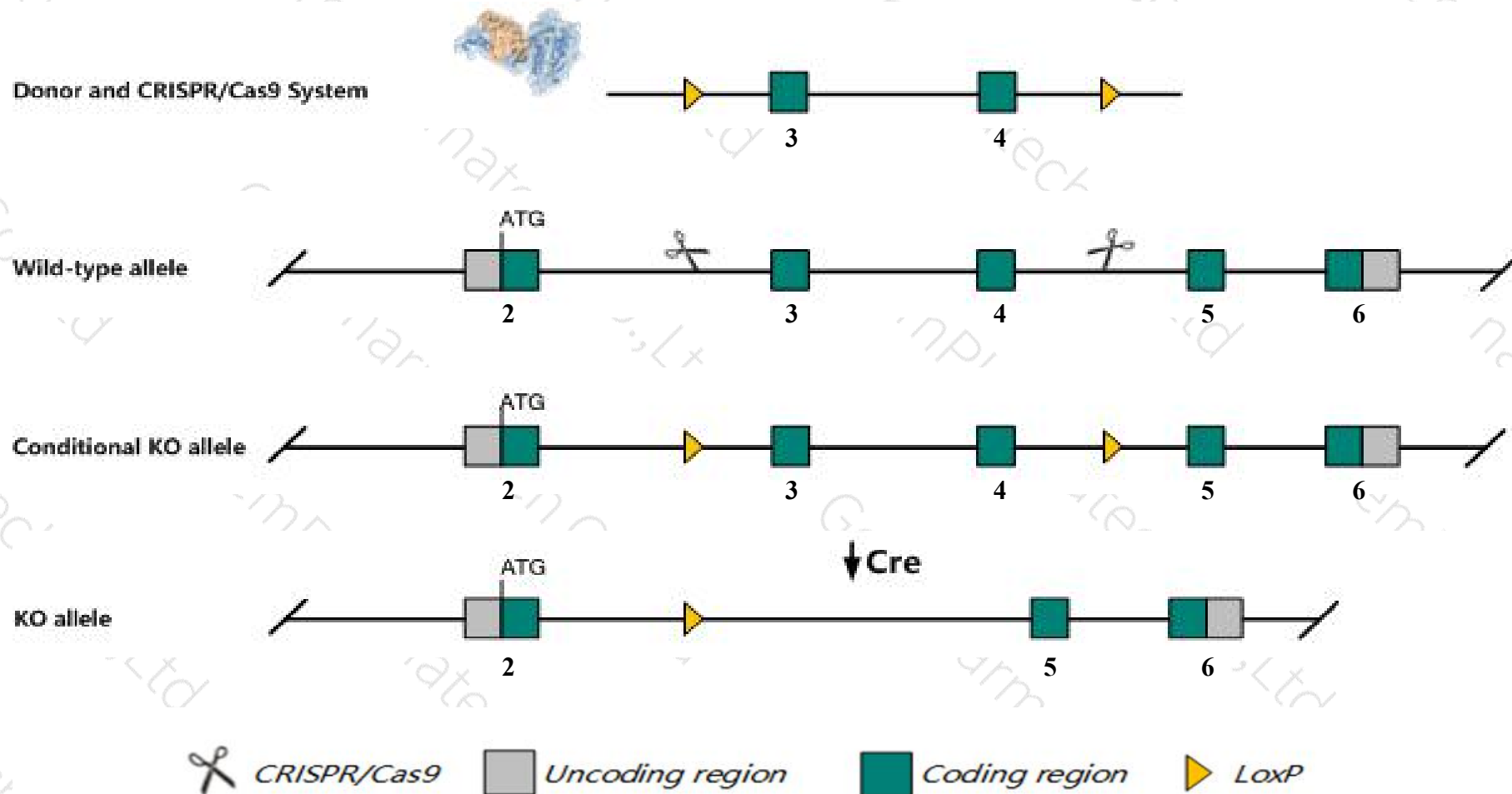
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

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



- The *Hpgds* gene has 3 transcripts. According to the structure of *Hpgds* gene, exon3-exon4 of *Hpgds-201* (ENSMUST00000031982.4) transcript is recommended as the knockout region. The region contains 203bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Hpgds* 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 sequencing. A stable F1 generation mouse model was obtained by mating positive F0 generation mice with C57BL/6JGpt mice.
- 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.

- According to the existing MGI data, Mice homozygous for a knock-out allele display increased IL-2 synthesis and heightened proliferation of ex vivo lymph node cultures in response to BSA or concanavalin A challenge, and fail to resolve a Th1-driven delayed type hypersensitivity reaction.
- The *Hpgds* gene is located on the Chr6. 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at existing technological level.

Gene information (NCBI)

Hpgds hematopoietic prostaglandin D synthase [*Mus musculus* (house mouse)]

Gene ID: 54486, updated on 3-Feb-2020

Summary

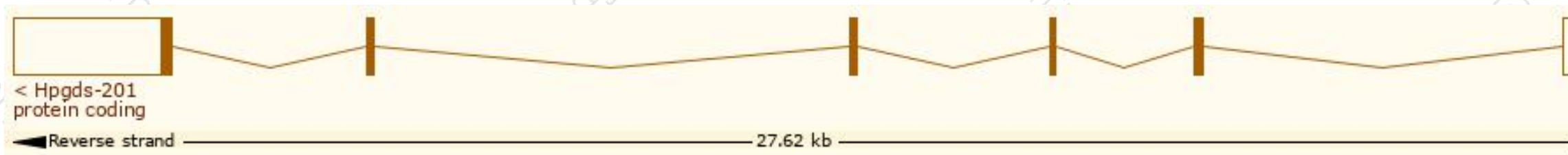
Official Symbol	Hpgds provided by MGI
Official Full Name	hematopoietic prostaglandin D synthase provided by MGI
Primary source	MGI:MGI:1859384
See related	Ensembl:ENSMUSG00000029919
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	H-PGDS; Ptgds2
Expression	Broad expression in placenta adult (RPKM 3.7), limb E14.5 (RPKM 1.5) and 20 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

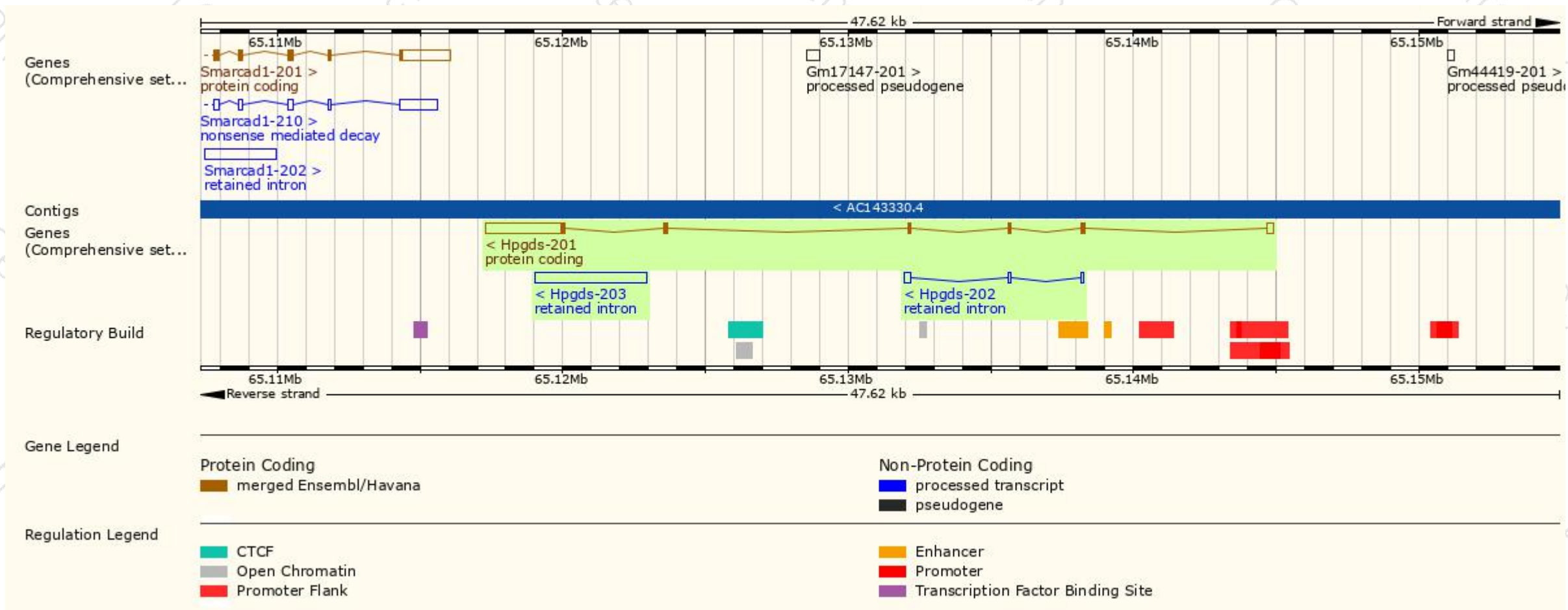
The gene has 3 transcripts, all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Hpgds-203	ENSMUST00000205250.1	3891	No protein	Retained intron	-	-	TSL:NA
Hpgds-202	ENSMUST00000170252.1	420	No protein	Retained intron	-	-	TSL:3
Hpgds-201	ENSMUST00000031982.4	3476	199aa	Protein coding	CCDS20205	Q9JHF7	TSL:1 GENCODE basic APPRIS P1

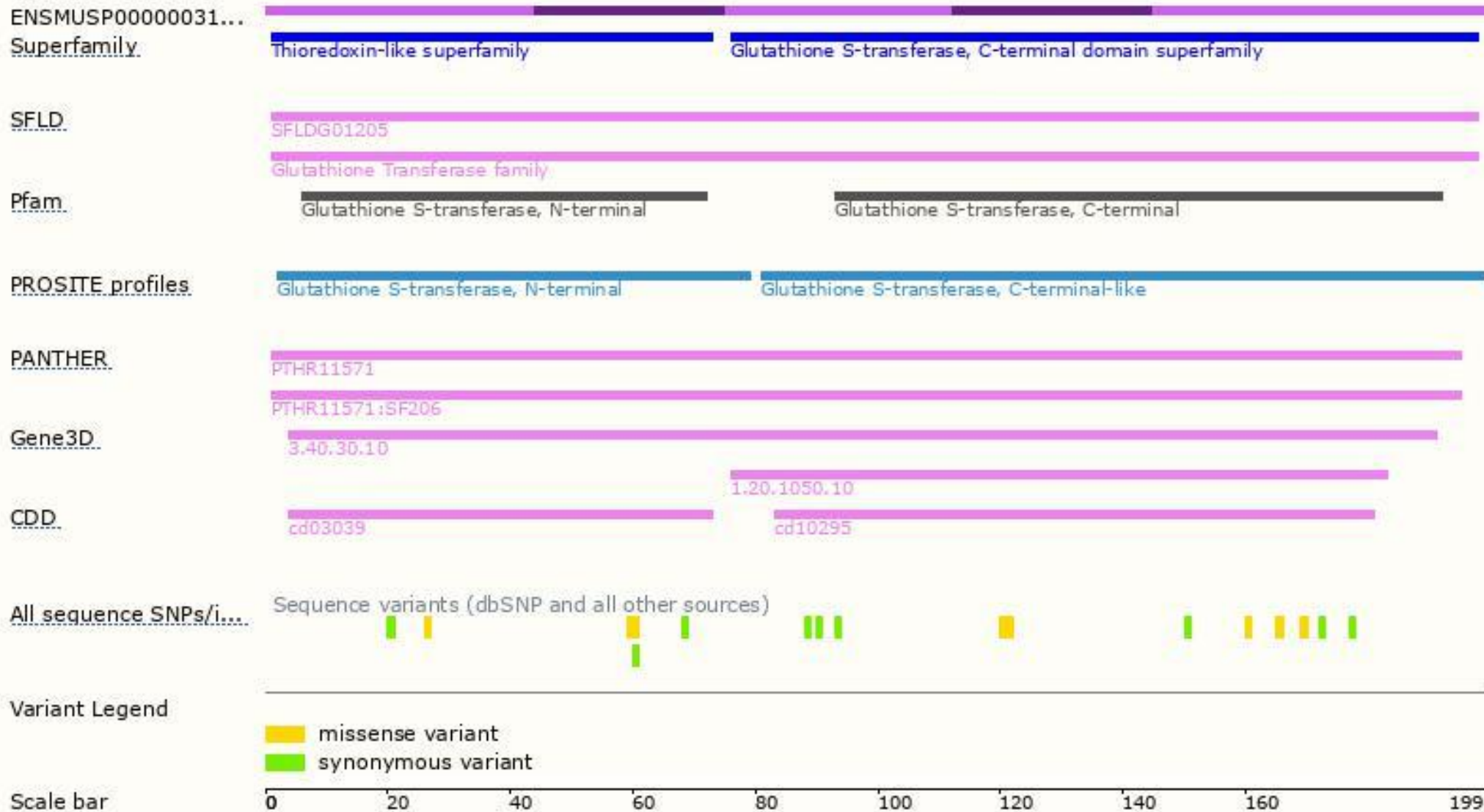
The strategy is based on the design of *Hpgds-201* transcript, the transcription is shown below:



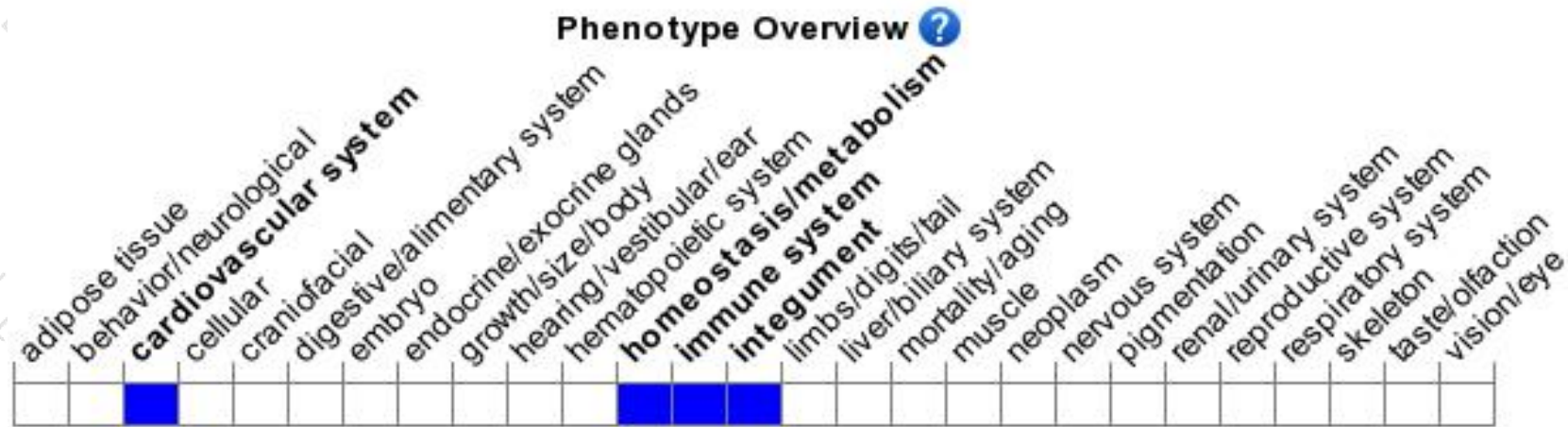
Genomic location distribution



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, Mice homozygous for a knock-out allele display increased IL-2 synthesis and heightened proliferation of ex vivo lymph node cultures in response to BSA or concanavalin A challenge, and fail to resolve a Th1-driven delayed type hypersensitivity reaction.