Tcf21 Cas9-CKO Strategy

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Project Overview

Project Name	***Tcf21***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

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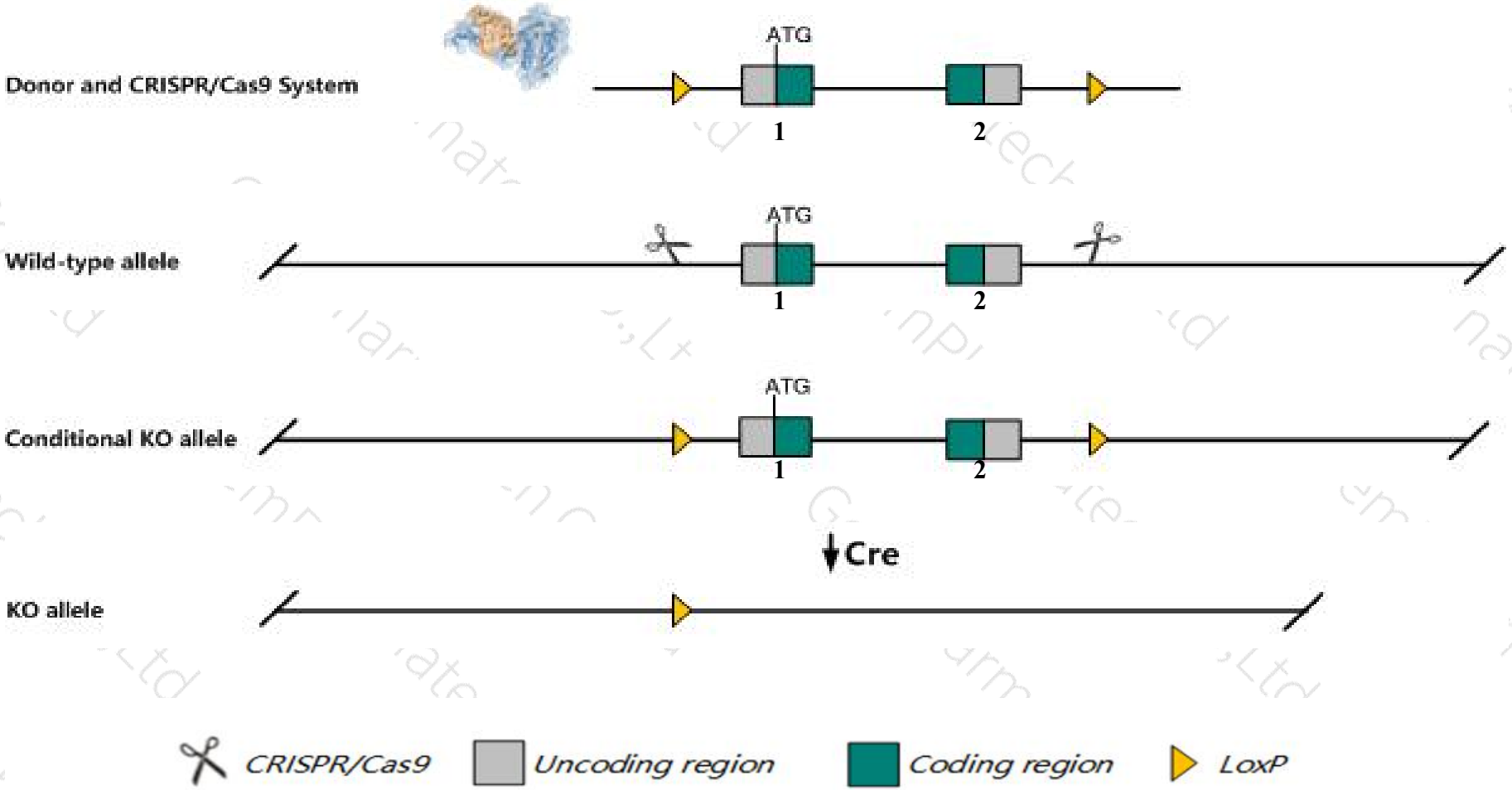
This model will use CRISPR/Cas9 technology to edit the *Tcf21* gene. The schematic diagram is as follows:



Technical routes

- The *Tcf21* gene has 2 transcripts. According to the structure of *Tcf21* gene, exon1-exon2 of *Tcf21-201* (ENSMUST00000049930.8) transcript is recommended as the knockout region.The region contains all of the coding sequence.Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Tcf21* 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.

Notice

➢ According to the existing MGI data,Homozygotes for targeted null mutations exhibit hypoplastic lungs and kidneys with abnormal vasculature of these organs and the hemopericardium, and die at birth due to respiratory failure. Homozygotes for some mutations are also asplenic. Some alleles cause sex reversal in XY mice.

➢The KO region contains the *Gm10824* gene.Knockout the region may affect the function of *Gm10824* gene.

➢ The *Tcf21* gene is located on the Chr10. 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）

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Tcf21 transcription factor 21 [Mus musculus (house mouse)]

Gene ID: 21412, updated on 9-Apr-2019

Summary

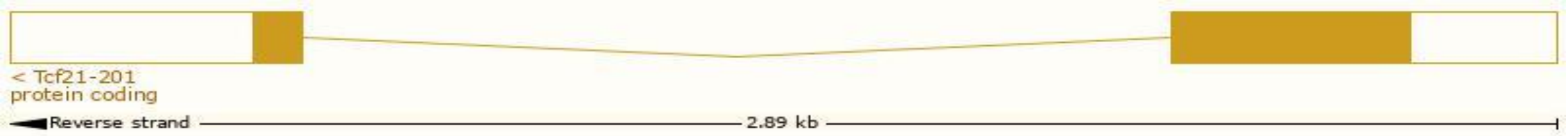
Official Symbol	Tcf21 provided by MGI
Official Full Name	transcription factor 21 provided byMGI
Primary source	MGI:MGI:1202715
See related	Ensembl:ENSMUSG00000045680
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Pod-1, Pod1, bHLHa23, capsulin, epc, epicardin
Expression	Biased expression in bladder adult (RPKM 101.3), lung adult (RPKM 85.6) and 14 other tissuesSee more
Orthologs	human all

Transcript information（Ensembl）

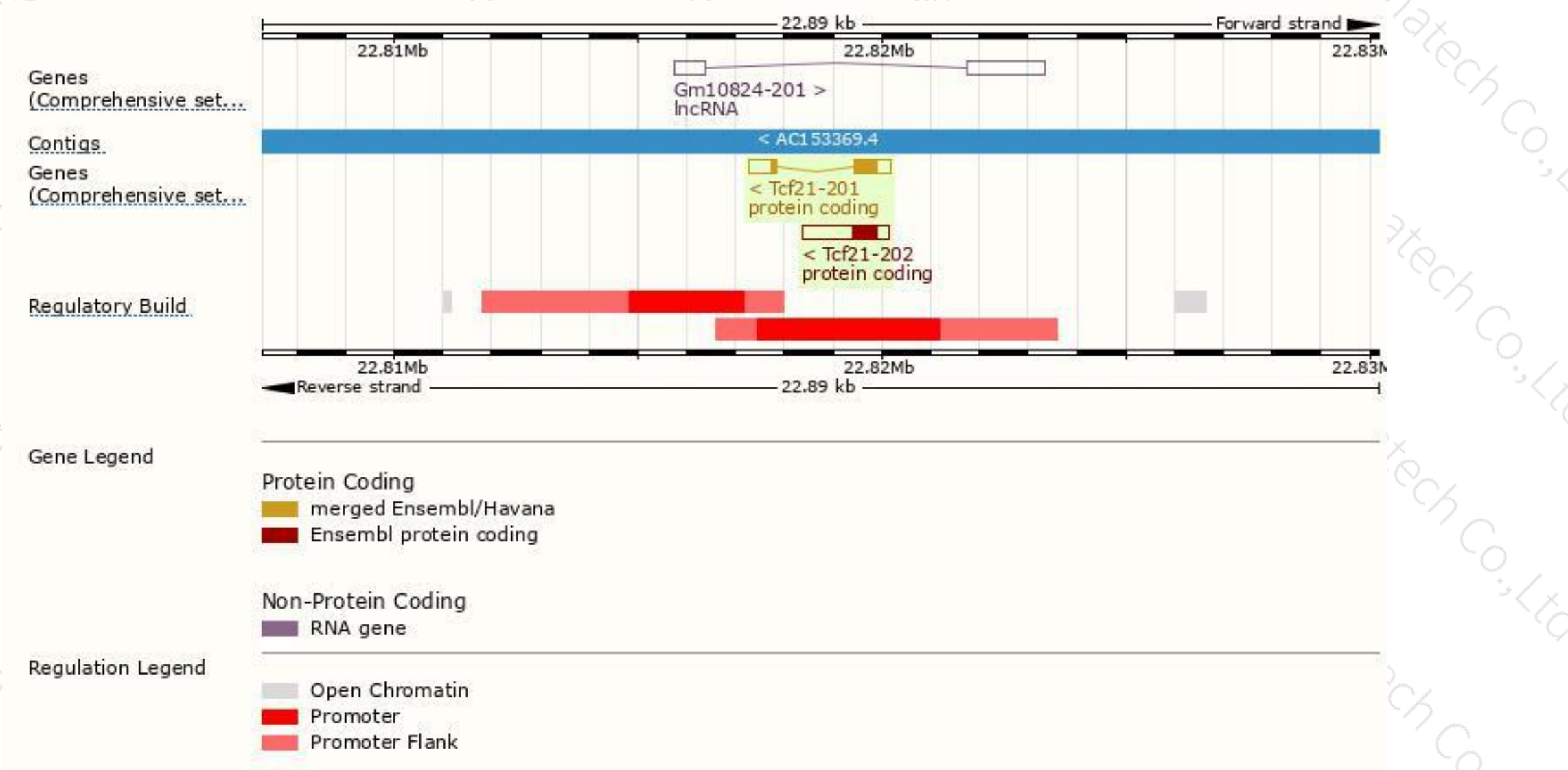
The gene has 2 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Tcf21-201	ENSMUST00000049930.8	1267	179aa	Protein coding	CCDS23732	O35437	TSL:1 GENCODE basic APPRIS P1
Tcf21-202	ENSMUST00000218002.1	1788	169aa	Protein coding	-	A0A1W2P7S0	TSL:NA GENCODE basic

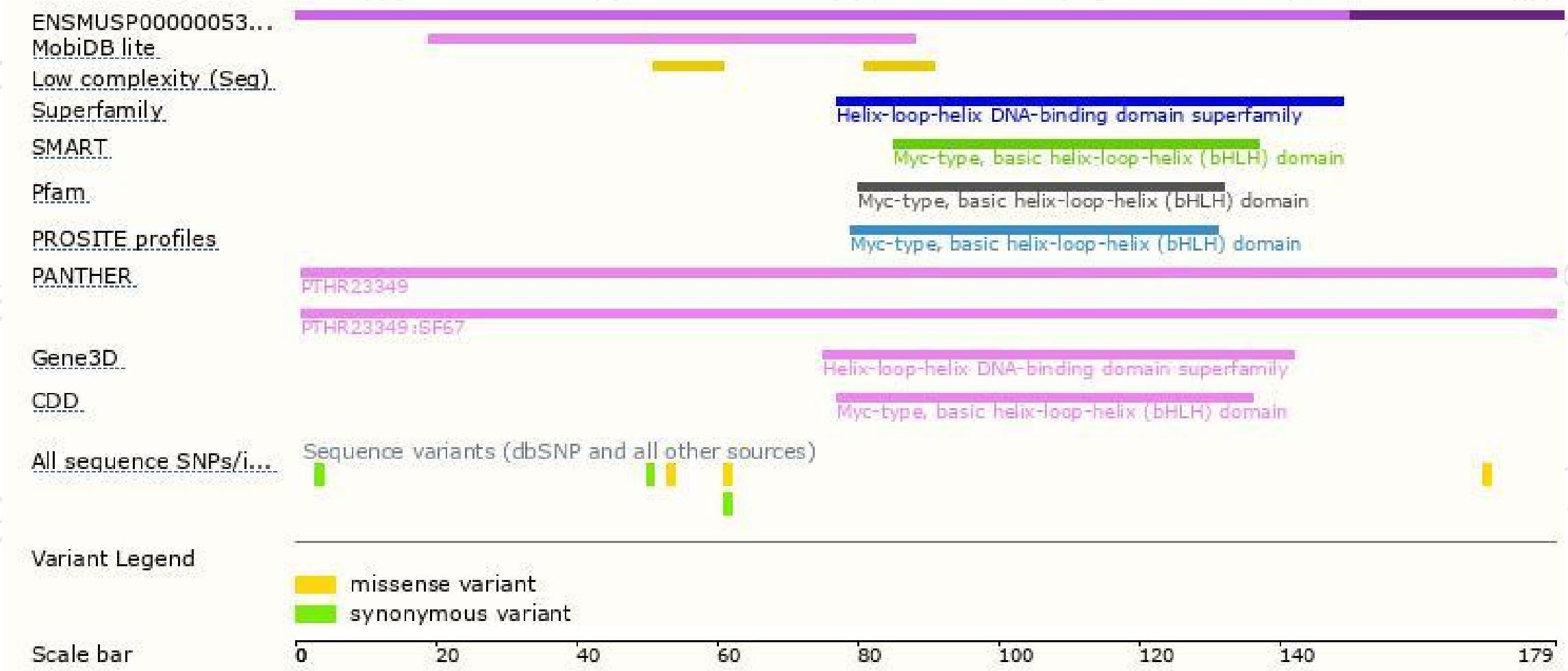
The strategy is based on the design of *Tcf21-201* transcript,The transcription is shown below



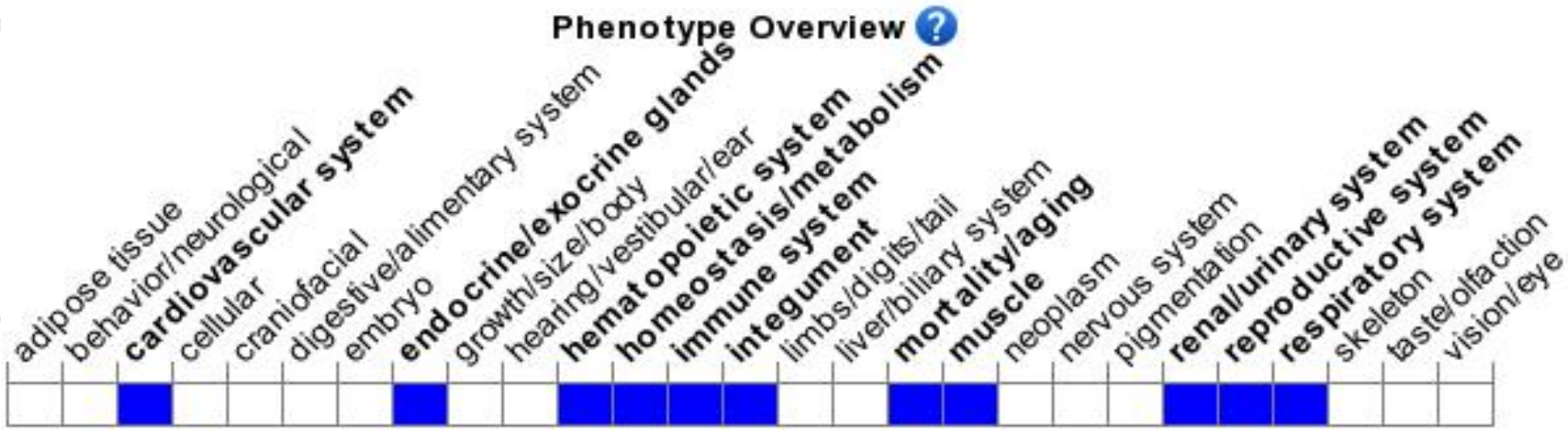
Genomic location distribution



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/).

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

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