Tfdp1 Cas9-CKO Strategy

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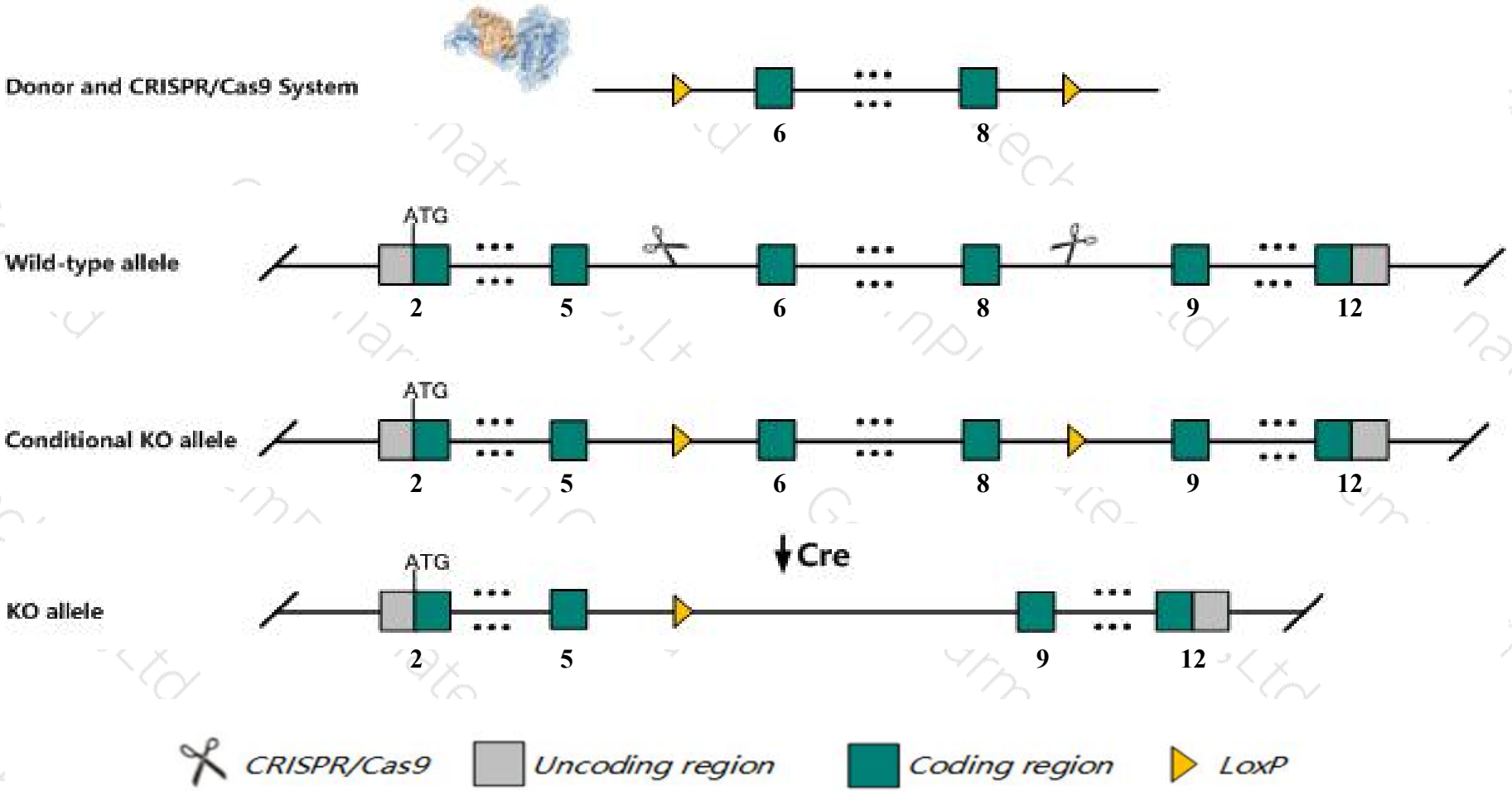
Project Overview

Project Name	***Tfdp1***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Tfdp1* gene. The schematic diagram is as follows:



Technical routes

- The *Tfdp1* gene has 9 transcripts. According to the structure of *Tfdp1* gene, exon6-exon8 of *Tfdp1-204* (ENSMUST00000209885.1) transcript is recommended as the knockout region.The region contains 379bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Tfdp1* 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 a targeted null mutation exhibit reduced expansion of the ectoplacental cone and chorion, small yolk sacs, and impaired endoreduplication in trophoblast giant cells. Mutants die by embryonic day 12.5.

➢ The *Tfdp1* gene is located on the Chr8. 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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Tfdp1 transcription factor Dp 1 [*Mus musculus* (house mouse)]

Gene ID: 21781, updated on 10-Oct-2019

Summary

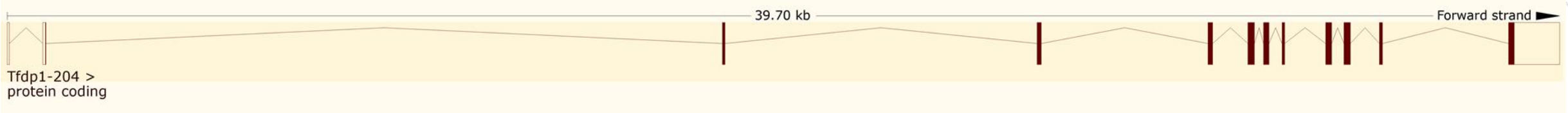
Official Symbol	Tfdp1 provided by MGI
Official Full Name	transcription factor Dp 1 provided by MGI
Primary source	MGI:MGI:101934
See related	Ensembl:ENSMUSG00000038482
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Dp1; Drtf1
Expression	Ubiquitous expression in CNS E11.5 (RPKM 53.8), liver E14 (RPKM 51.3) and 28 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

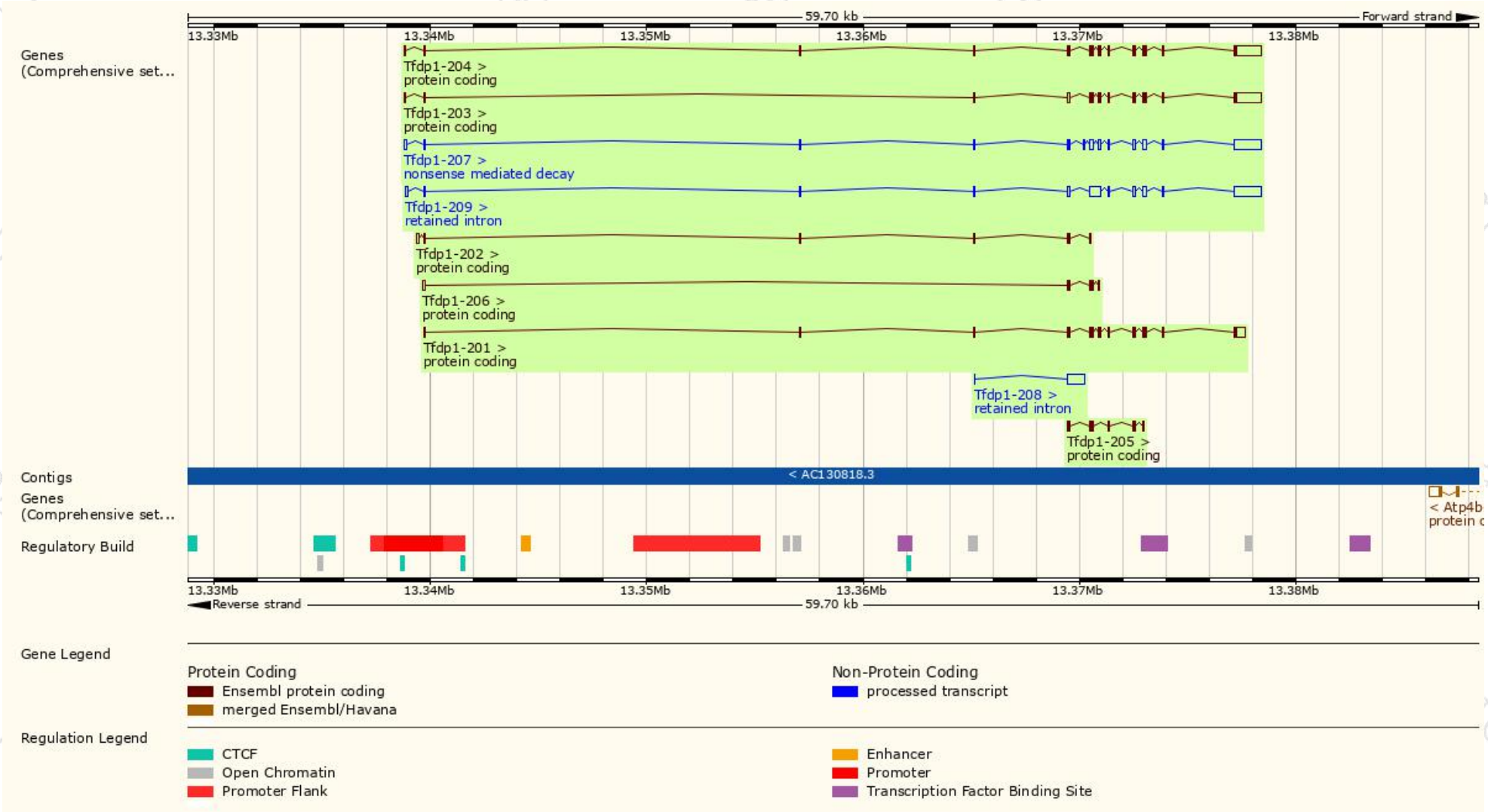
The gene has 9 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Tfdp1-201	ENSMUST00000170909.1	1700	410aa	Protein coding	CCDS22110	Q08639 Q3V3X3	TSL:1 GENCODE basic APPRIS P3
Tfdp1-202	ENSMUST00000209282.1	552	124aa	Protein coding	-	A0A1B0GSS4	CDS 3' incomplete TSL:3
Tfdp1-203	ENSMUST00000209396.1	2421	290aa	Protein coding	CCDS85506	Q9CYZ7	TSL:1 GENCODE basic APPRIS ALT2
Tfdp1-204	ENSMUST00000209885.1	2511	410aa	Protein coding	CCDS22110	Q08639 Q3V3X3	TSL:1 GENCODE basic APPRIS P3
Tfdp1-205	ENSMUST00000209945.1	551	183aa	Protein coding	-	A0A1B0GRP0	CDS 5' and 3' incomplete TSL:2
Tfdp1-206	ENSMUST00000210165.1	452	128aa	Protein coding	-	A0A1B0GR23	CDS 3' incomplete TSL:3
Tfdp1-207	ENSMUST00000210501.1	2682	106aa	Nonsense mediated decay	-	A0A1B0GRI4	TSL:5
Tfdp1-208	ENSMUST00000210518.1	832	No protein	Retained intron	-	-	TSL:3
Tfdp1-209	ENSMUST00000211606.1	2787	No protein	Retained intron	-	-	TSL:2

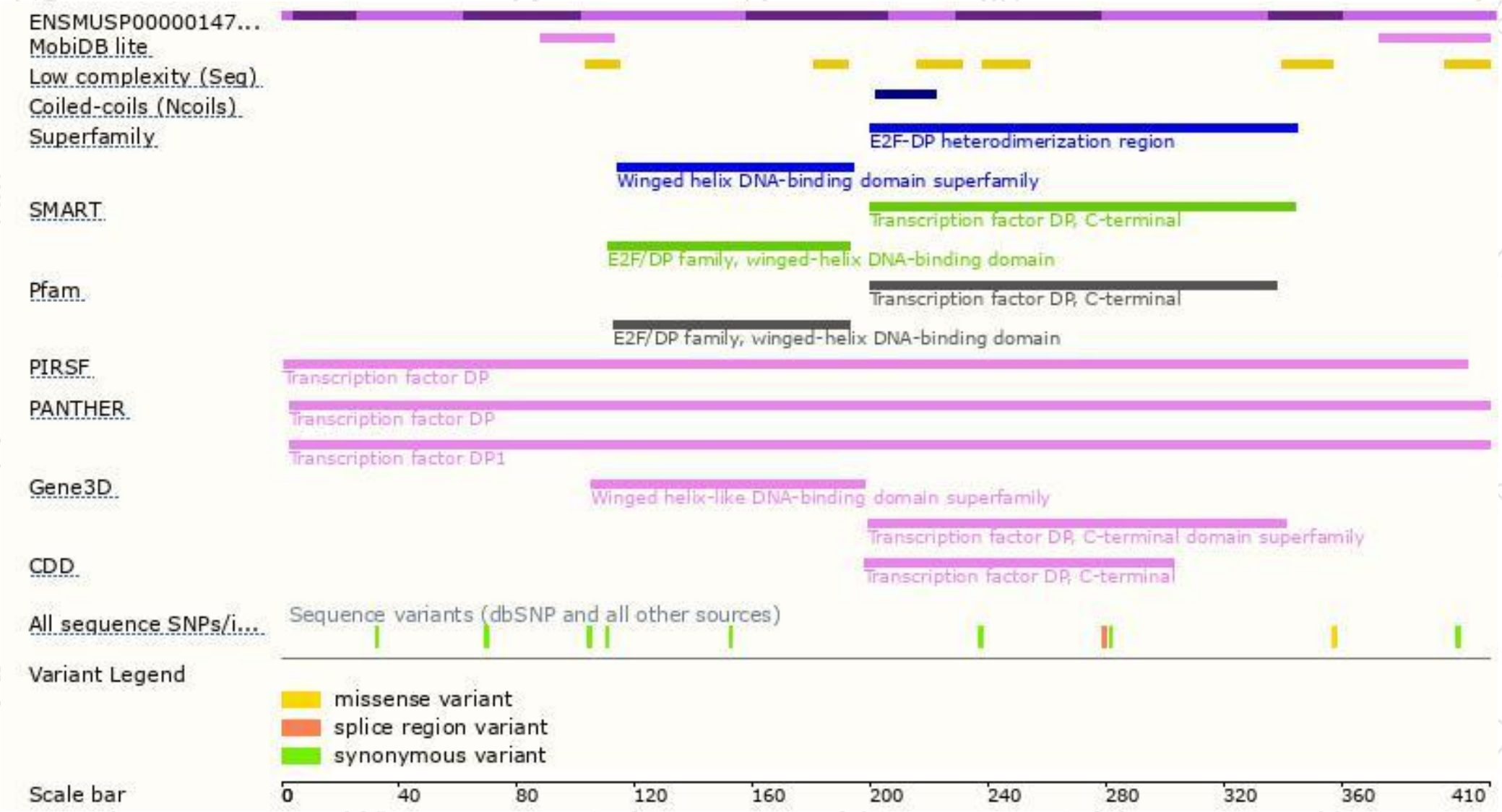
The strategy is based on the design of *Tfdp1-204* transcript,The transcription is shown below:



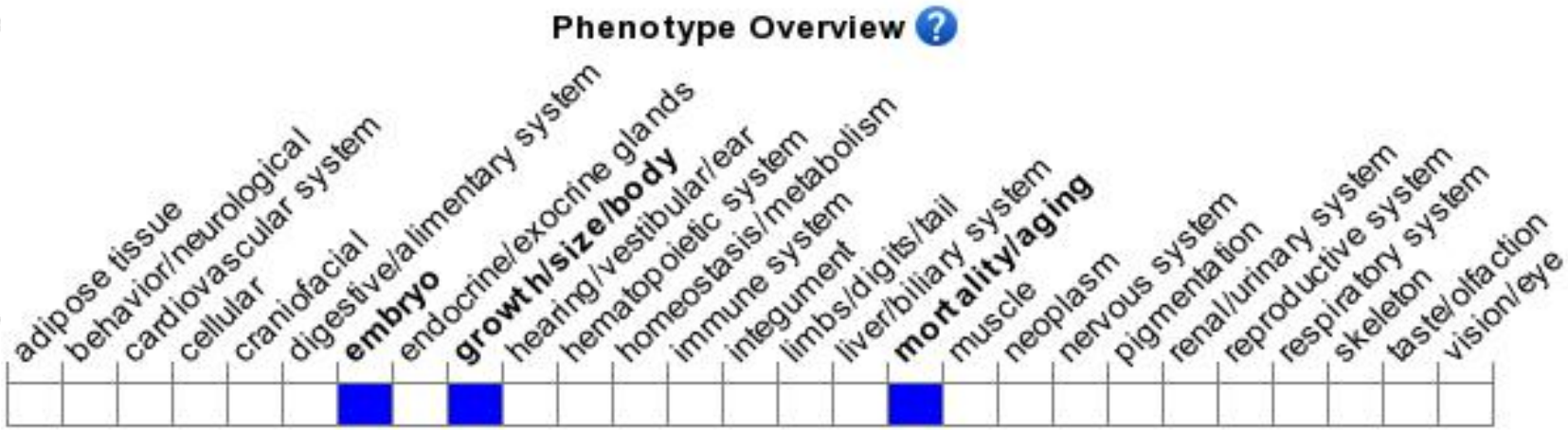
Genomic location distribution



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,Homozygotes for a targeted null mutation exhibit reduced expansion of the ectoplacental cone and chorion, small yolk sacs, and impaired endoreduplication in trophoblast giant cells. Mutants die by embryonic day 12.5.

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

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