Tyrp1 Cas9-CKO Strategy

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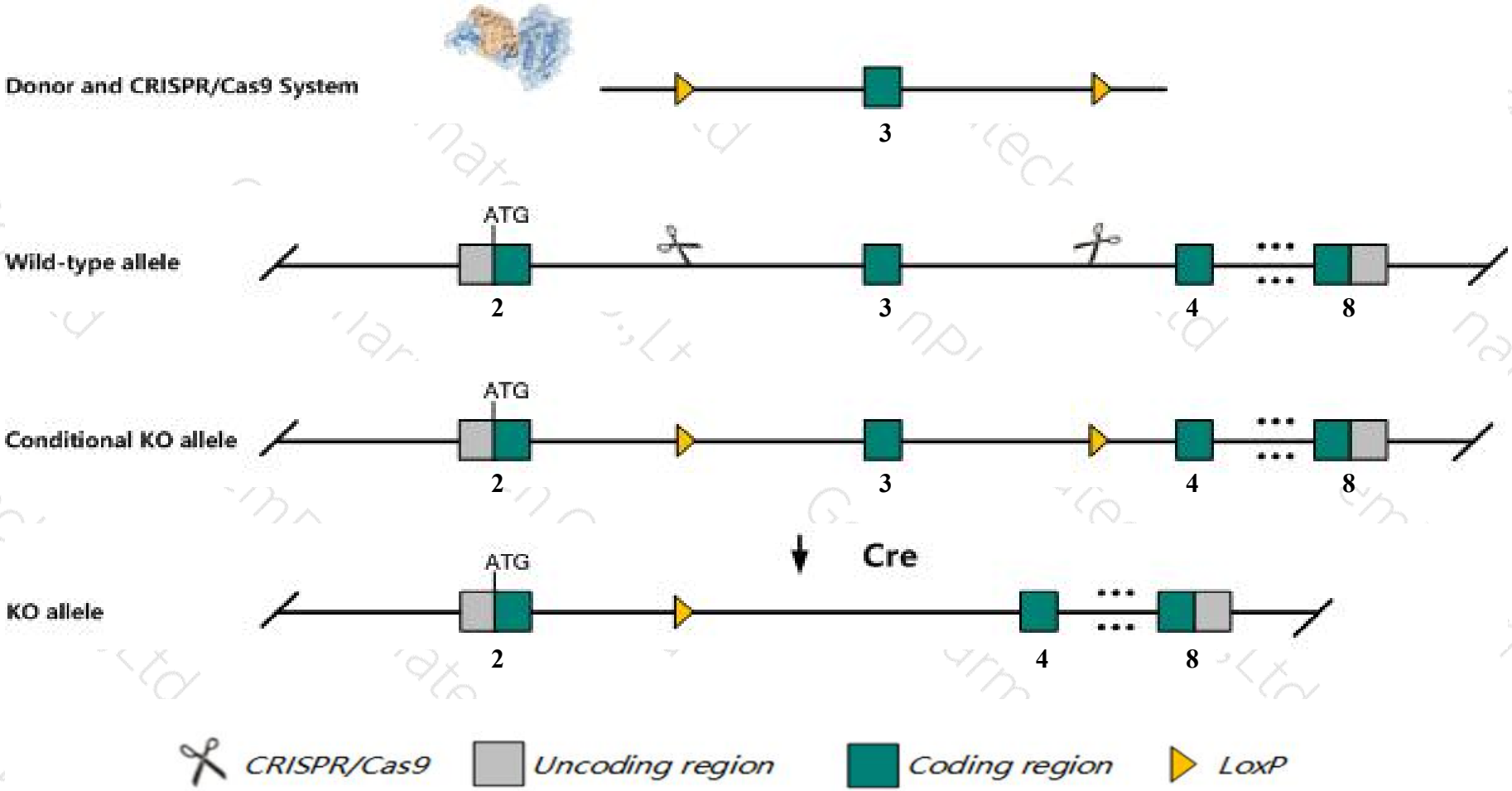
Design Date: 2019/10/21

Project Overview

Project Name	***Tyrp1***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Tyrp1* gene. The schematic diagram is as follows:



Technical routes

- The *Tyrp1* gene has 4 transcripts. According to the structure of *Tyrp1* gene, exon3 of *Tyrp1-201* (ENSMUST00000006151.12) transcript is recommended as the knockout region.The region contains 323bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Tyrp1* 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,The major influence of mutations at this locus is to change eumelanin from a black to a brown pigment in the coat and eyes in varying degrees. Semidominant mutants result in melanocyte degeneration causing reduced pigmentation and progressive hearing loss.

- The *Tyrp1* 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at existing technological level.

Gene information （NCBI）

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Tyrp1 tyrosinase-related protein 1 [*Mus musculus* (house mouse)]

Gene ID: 22178, updated on 10-Oct-2019

Summary

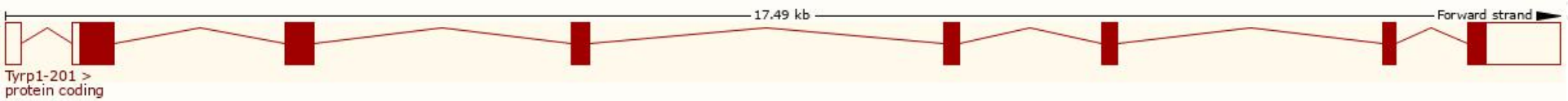
Official Symbol	Tyrp1 provided by MGI
Official Full Name	tyrosinase-related protein 1 provided by MGI
Primary source	MGI:MGI:98881
See related	Ensembl:ENSMUSG00000005994
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	b; isa; Oca3; TRP1; Tyrp; TRP-1; brown
Expression	Low expression observed in reference dataset See more
Orthologs	human all

Transcript information（Ensembl）

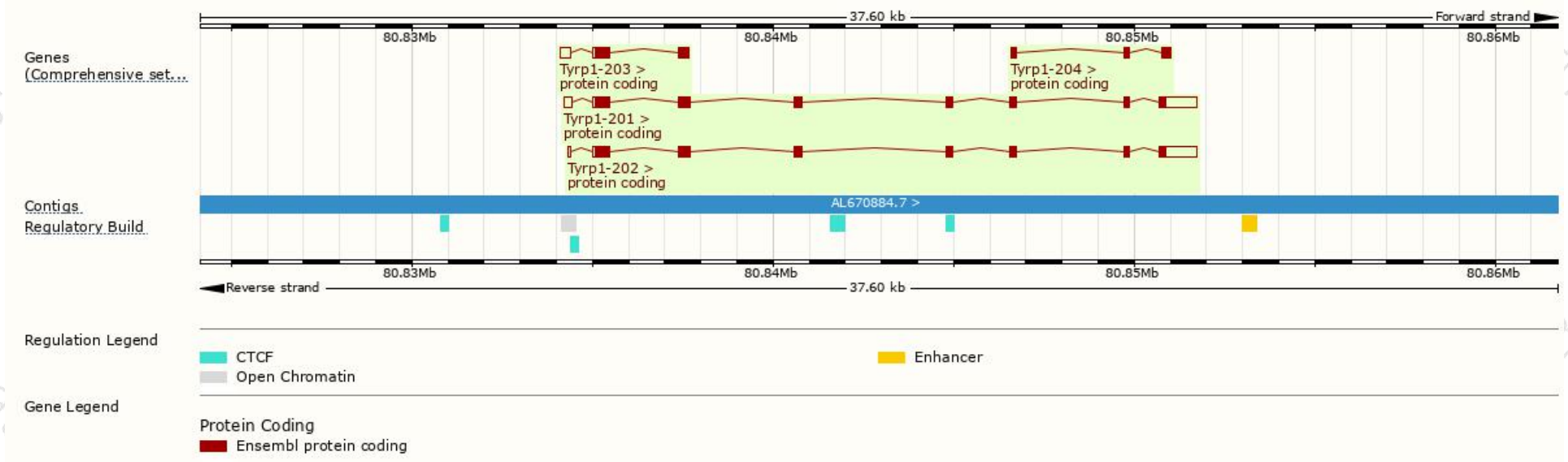
The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Tyrp1-201	ENSMUST00000006151.12	2720	537aa	Protein coding	CCDS18290	P07147 Q3UFS3	TSL:1 GENCODE basic APPRIS P1
Tyrp1-202	ENSMUST00000102831.7	2623	537aa	Protein coding	CCDS18290	P07147 Q3UFS3	TSL:1 GENCODE basic APPRIS P1
Tyrp1-203	ENSMUST00000133655.7	1053	229aa	Protein coding	-	A2ADJ4	CDS 3' incomplete TSL:2
Tyrp1-204	ENSMUST00000133932.1	529	176aa	Protein coding	-	A2ADJ6	CDS 5' and 3' incomplete TSL:1

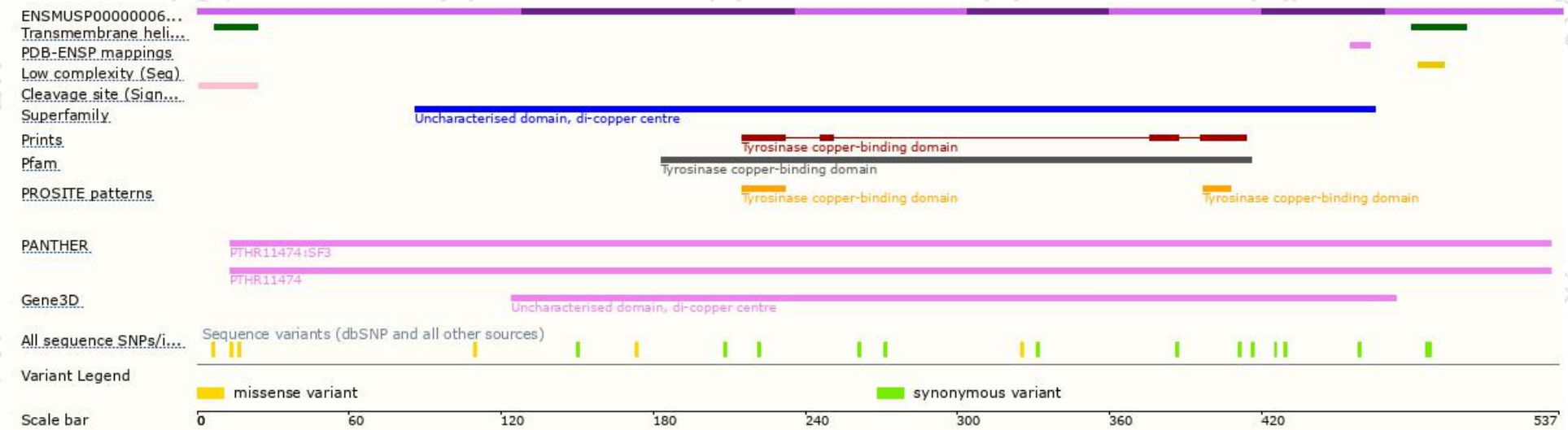
The strategy is based on the design of *Tyrp1-201* transcript,The transcription is shown below



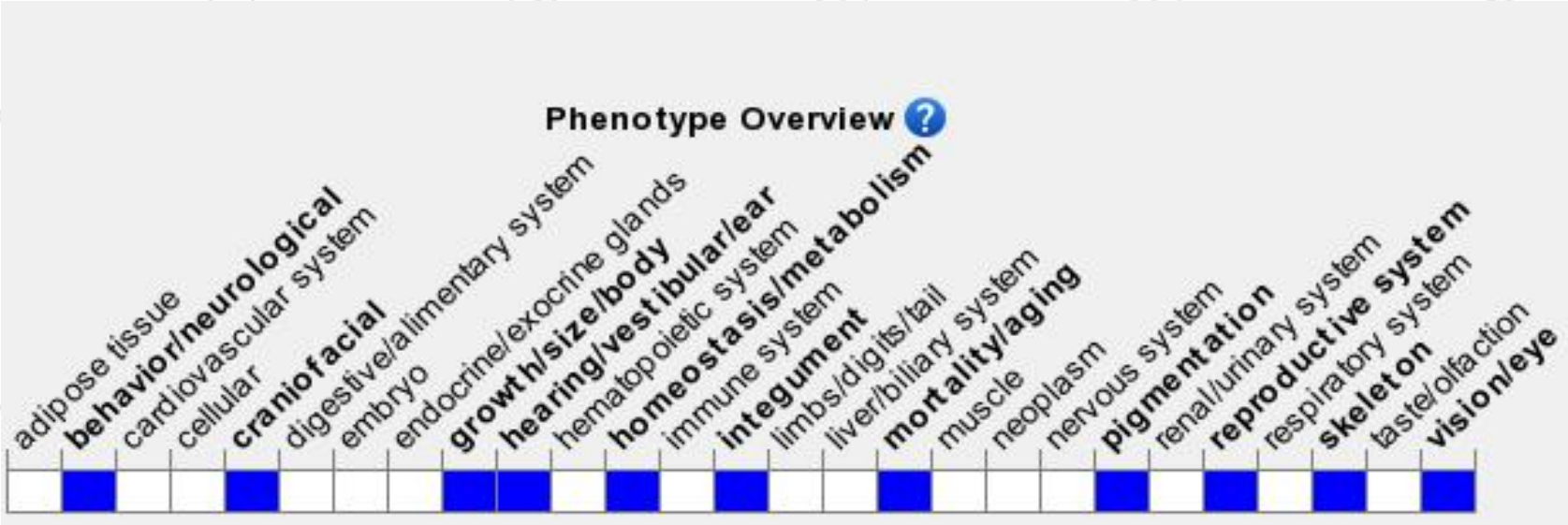
Genomic location distribution



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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