

Cyp4b1 Cas9-CKO Strategy

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Project Overview

Project Name

Cyp4b1

Project type

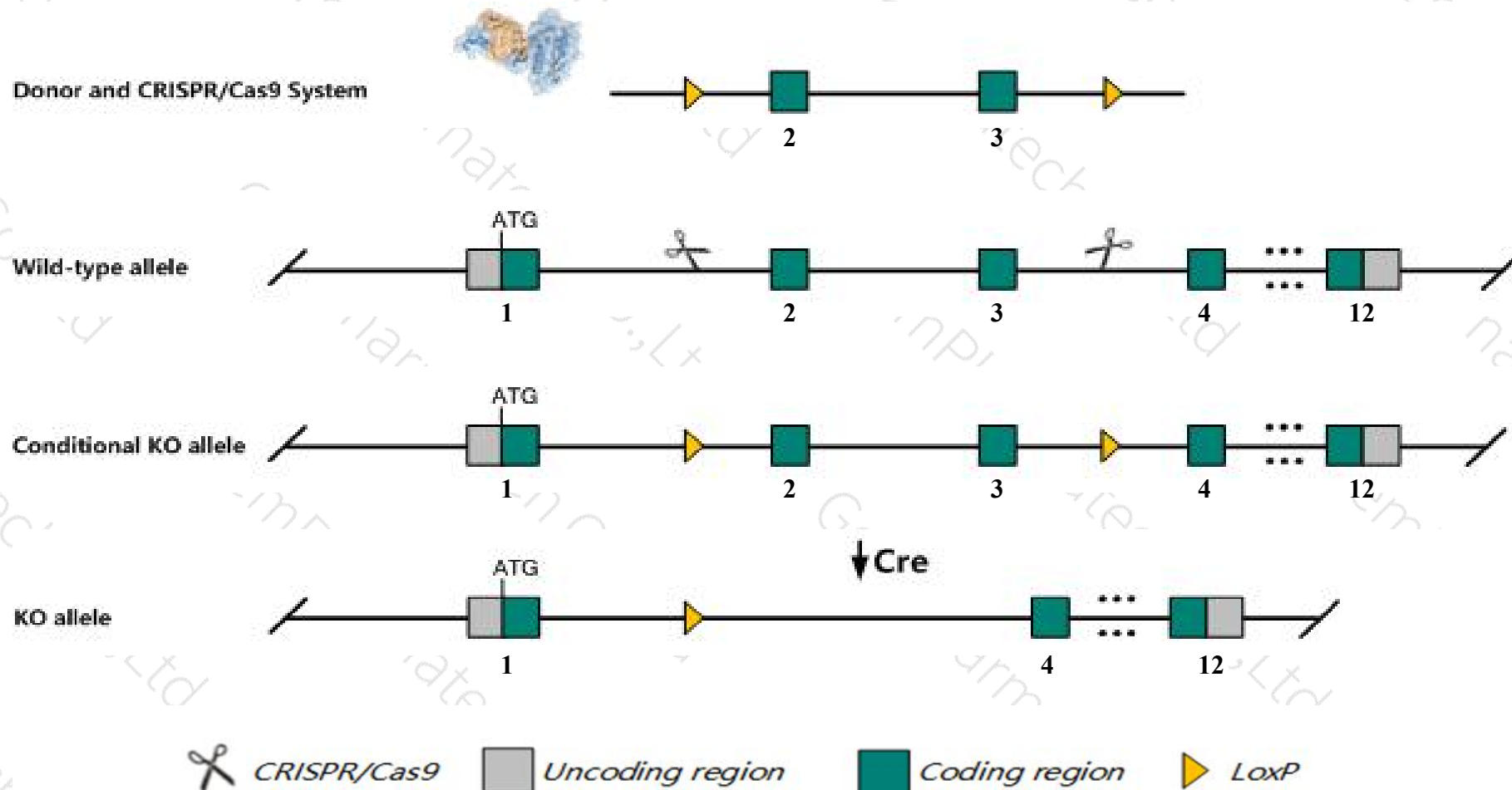
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Cyp4b1* gene. The schematic diagram is as follows:



Technical routes

- The *Cyp4b1* gene has 4 transcripts. According to the structure of *Cyp4b1* gene, exon2-exon3 of *Cyp4b1-201* (ENSMUST00000102707.9) transcript is recommended as the knockout region. The region contains 187bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Cyp4b1* 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, mice homozygous for a knock-out allele exhibit resistance to 4-ipomeanol activation and toxicity.
- The *Cyp4b1* 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)

Cyp4b1 cytochrome P450, family 4, subfamily b, polypeptide 1 [*Mus musculus* (house mouse)]

Gene ID: 13120, updated on 12-Aug-2019

Summary

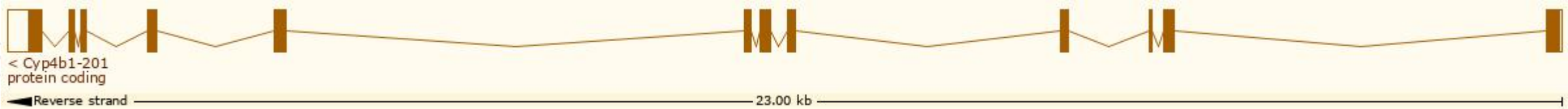
Official Symbol	Cyp4b1 provided by MGI
Official Full Name	cytochrome P450, family 4, subfamily b, polypeptide 1 provided by MGI
Primary source	MGI:MGI:103225
See related	Ensembl:ENSMUSG00000028713
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	CYP4B1
Expression	Biased expression in lung adult (RPKM 334.9), kidney adult (RPKM 109.5) and 5 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

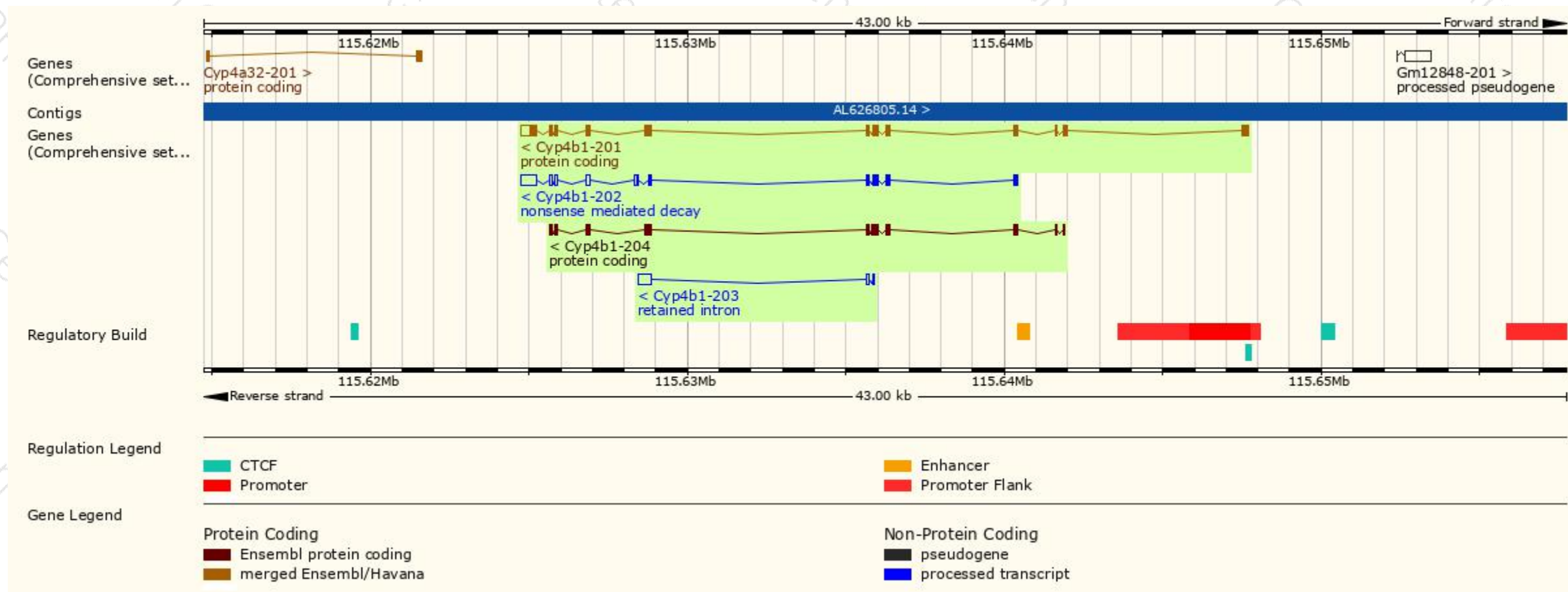
The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Cyp4b1-203	ENSMUST00000143237.1	544	No protein	Retained intron	-	-	TSL:2
Cyp4b1-201	ENSMUST00000102707.9	1892	511aa	Protein coding	CCDS18493	Q3TNA0 Q64462	TSL:1 GENCODE basic APPRIS P1
Cyp4b1-204	ENSMUST00000145841.3	1126	375aa	Protein coding	-	F6X6A4	CDS 5' and 3' incomplete TSL:5
Cyp4b1-202	ENSMUST00000135569.7	1497	208aa	Nonsense mediated decay	-	A0A0A6YY50	CDS 5' incomplete TSL:1

The strategy is based on the design of *Cyp4b1-201* transcript, the transcription is shown below:



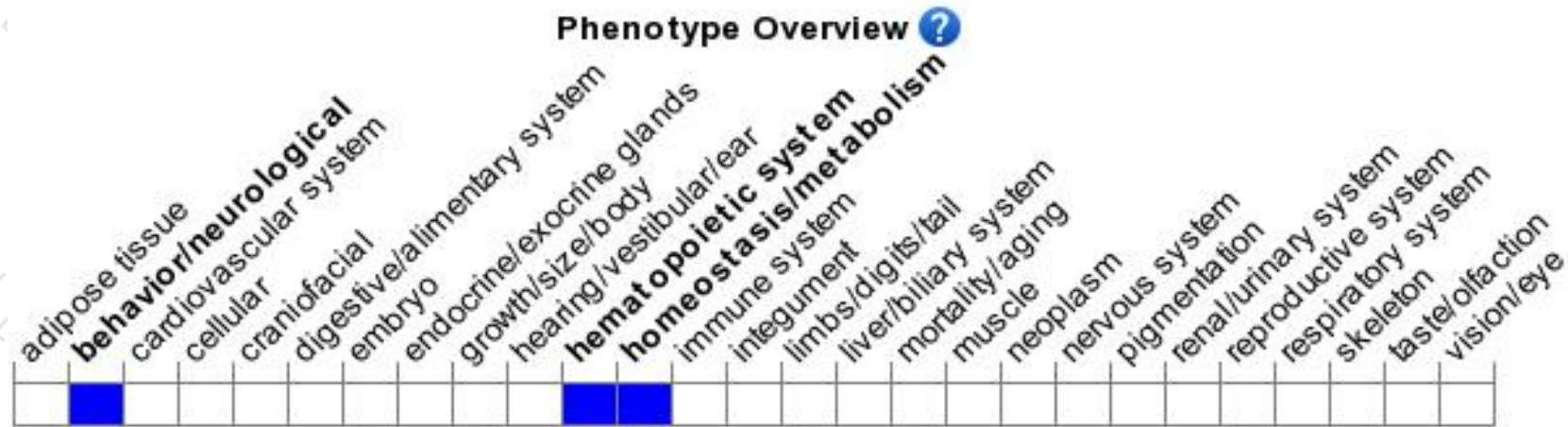
Genomic location distribution



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 exhibit resistance to 4-ipomeanol activation and toxicity.

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

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