Cyp51 Cas9-CKO Strategy

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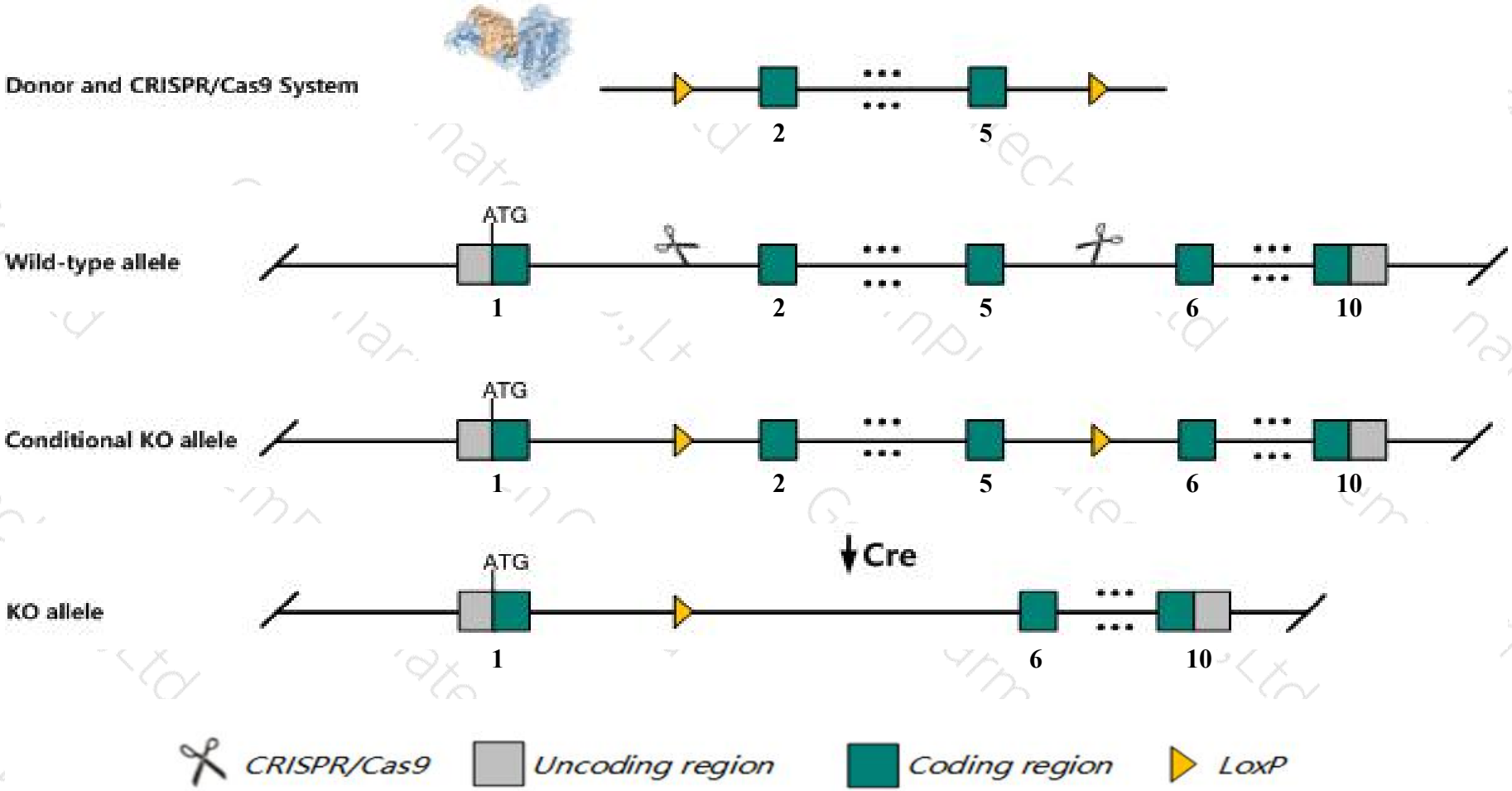
Project Overview

Project Name	***Cyp51***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Cyp51* gene. The schematic diagram is as follows:



Technical routes

- The *Cyp51* gene has 4 transcripts. According to the structure of *Cyp51* gene, exon2-exon5 of *Cyp51-201* (ENSMUST00000001507.4) transcript is recommended as the knockout region.The region contains 578bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Cyp51* 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 skeletal and craniofacial abnormalities and die at late midgestation due to heart failure resulting from cardiac hypoplasia, ventricle septum, epicardial and vasculogenesis defects.

- The *Cyp51* gene is located on the Chr5. 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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Cyp51 cytochrome P450, family 51 [Mus musculus (house mouse)]

Gene ID: 13121, updated on 31-Jan-2019

Summary

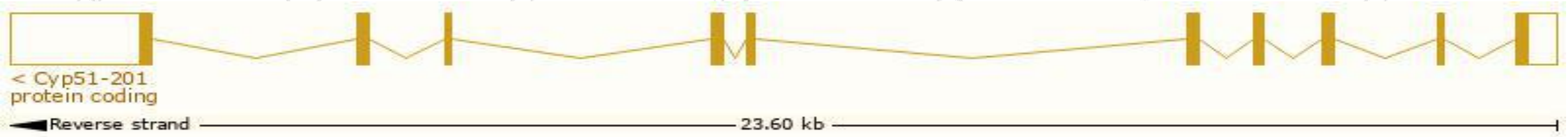
Official Symbol	Cyp51 provided by MGI
Official Full Name	cytochrome P450, family 51 provided by MGI
Primary source	MGI:MGI:106040
See related	Ensembl:ENSMUSG00000001467
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	AI426508, CYPLI, Cyp51a1, Ldm, P450-14DM, P450LI
Expression	Ubiquitous expression in CNS E18 (RPKM 27.0), CNS E11.5 (RPKM 23.5) and 27 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

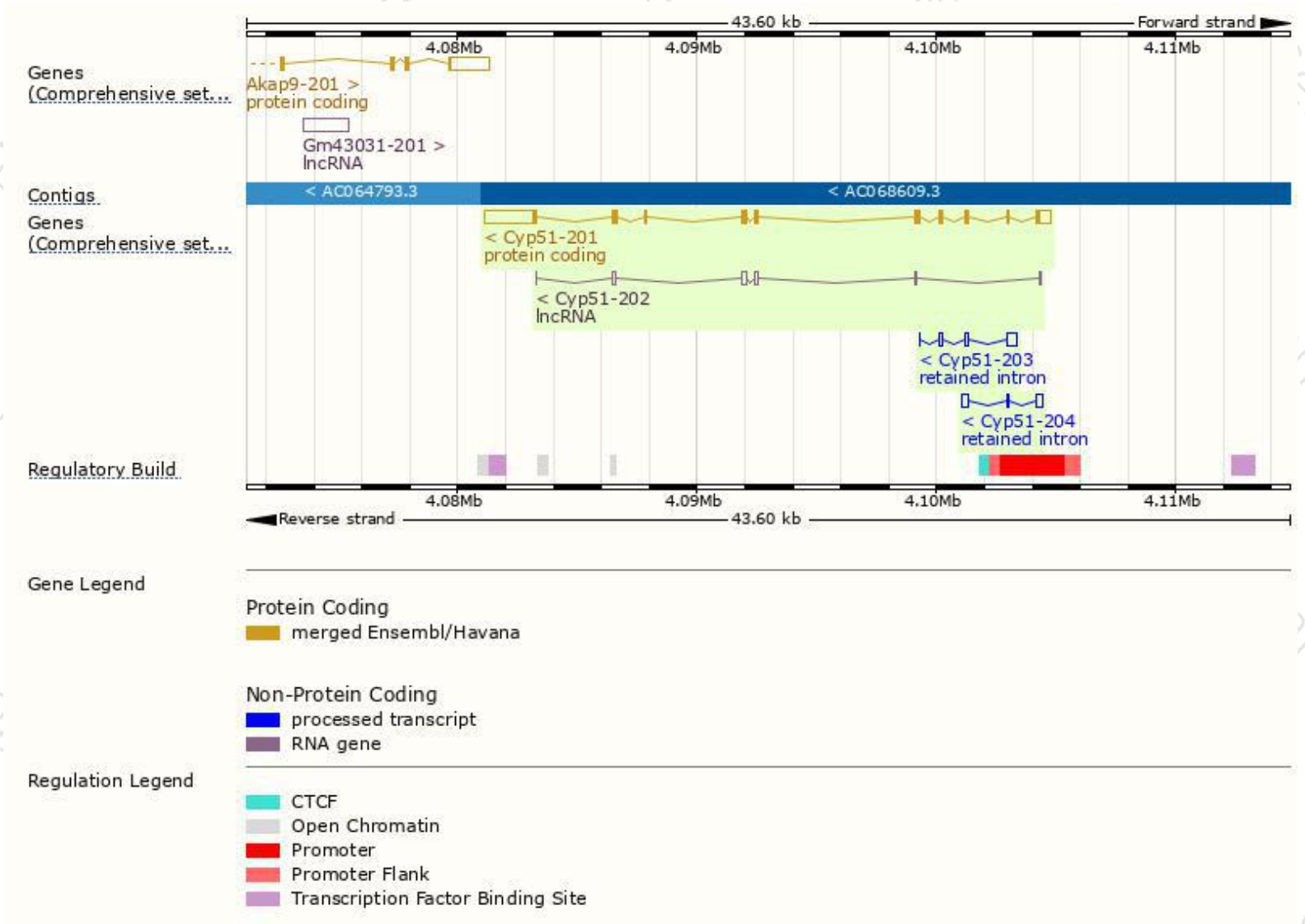
The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Cyp51-201	ENSMUST00000001507.4	3931	503aa	Protein coding	CCDS19071	Q8K0C4	TSL:1 GENCODE basic APPRIS P1
Cyp51-203	ENSMUST00000151539.2	781	No protein	Retained intron	-	-	TSL:2
Cyp51-204	ENSMUST00000199909.1	693	No protein	Retained intron	-	-	TSL:2
Cyp51-202	ENSMUST00000129448.1	528	No protein	lncRNA	-	-	TSL:5

The strategy is based on the design of *Cyp51-201* 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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