Cyp11a1 Cas9-CKO Strategy

Designer: Huan Fan

Design Date: 2019-7-25

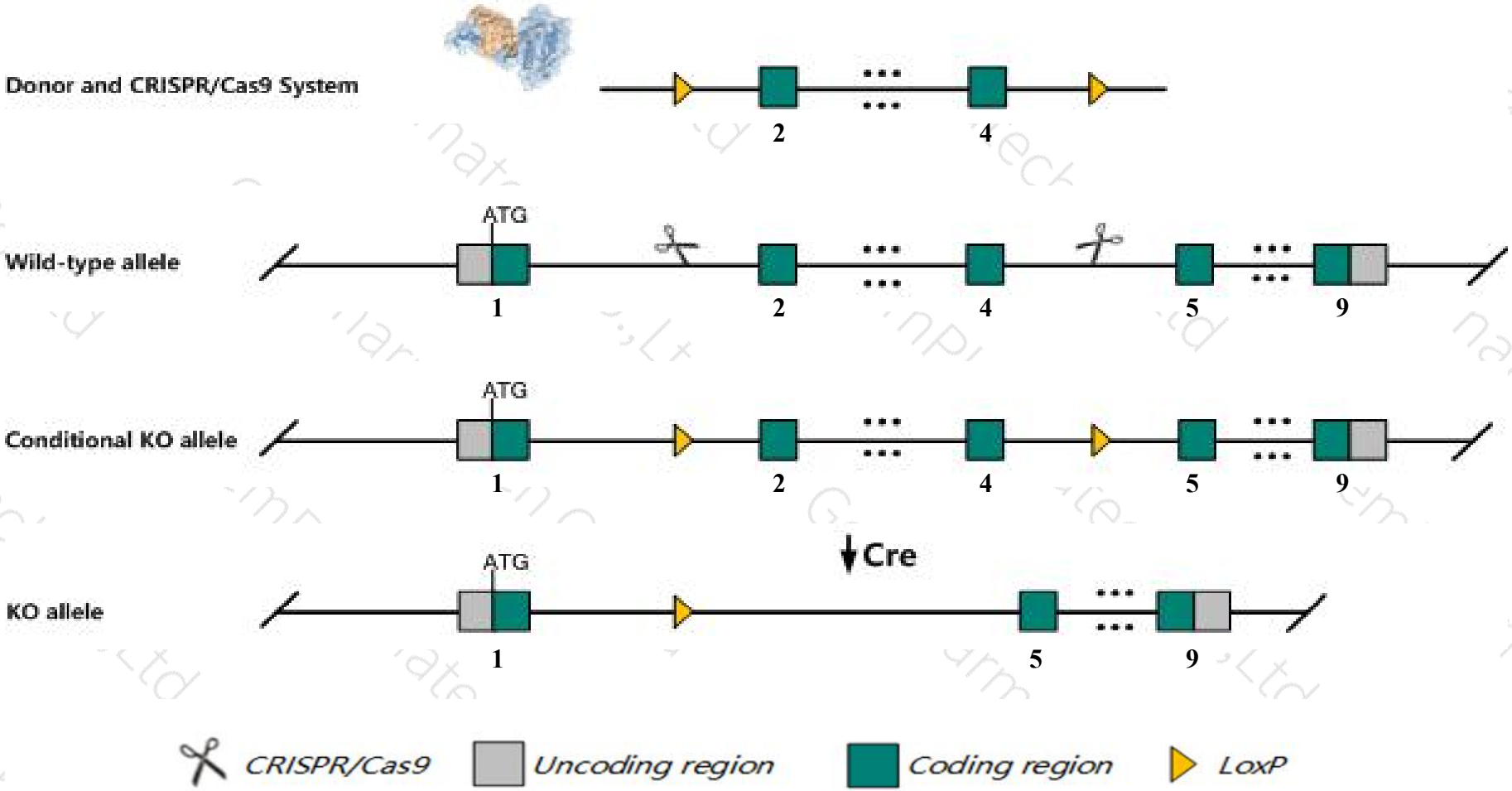
Project Overview

Project Name	***Cyp11a1***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

集萃药康 GemPharmatech

This model will use CRISPR/Cas9 technology to edit the *Cyp11a1* gene. The schematic diagram is as follows:



Technical routes

- The *Cyp11a1* gene has 4 transcripts. According to the structure of *Cyp11a1* gene, exon2-exon4 of *Cyp11a1-201* (ENSMUST00000034874.13) transcript is recommended as the knockout region.The region contains 560bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Cyp11a1* 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,Homozygous null mice are exhibit a steroid deficiency and die within days of birth showing signs of dehydration. Males are feminized with female external genitalia and underdeveloped gonads. Mice homozgyous for another knock-out allele exhibit abnormal adrenal development and neonatal lethality.

- The *Cyp11a1* gene is located on the Chr9. 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）

集萃药康 GemPharmatech

Cyp11a1 cytochrome P450, family 11, subfamily a, polypeptide 1 [Mus musculus (house mouse)]

Gene ID: 13070, updated on 19-Mar-2019

Summary

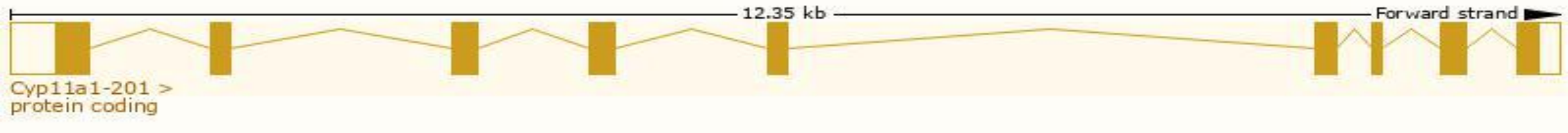
Official Symbol	Cyp11a1 provided by MGI
Official Full Name	cytochrome P450, family 11, subfamily a, polypeptide 1 provided by MGI
Primary source	MGI:MGI:88582
See related	Ensembl:ENSMUSG00000032323
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Cyp11a, Cypxia1, D9Ertd411e, P450scc, Scc, cscc
Expression	Biased expression in adrenal adult (RPKM 494.9), ovary adult (RPKM 389.8) and 1 other tissue See more
Orthologs	human all

Transcript information（Ensembl）

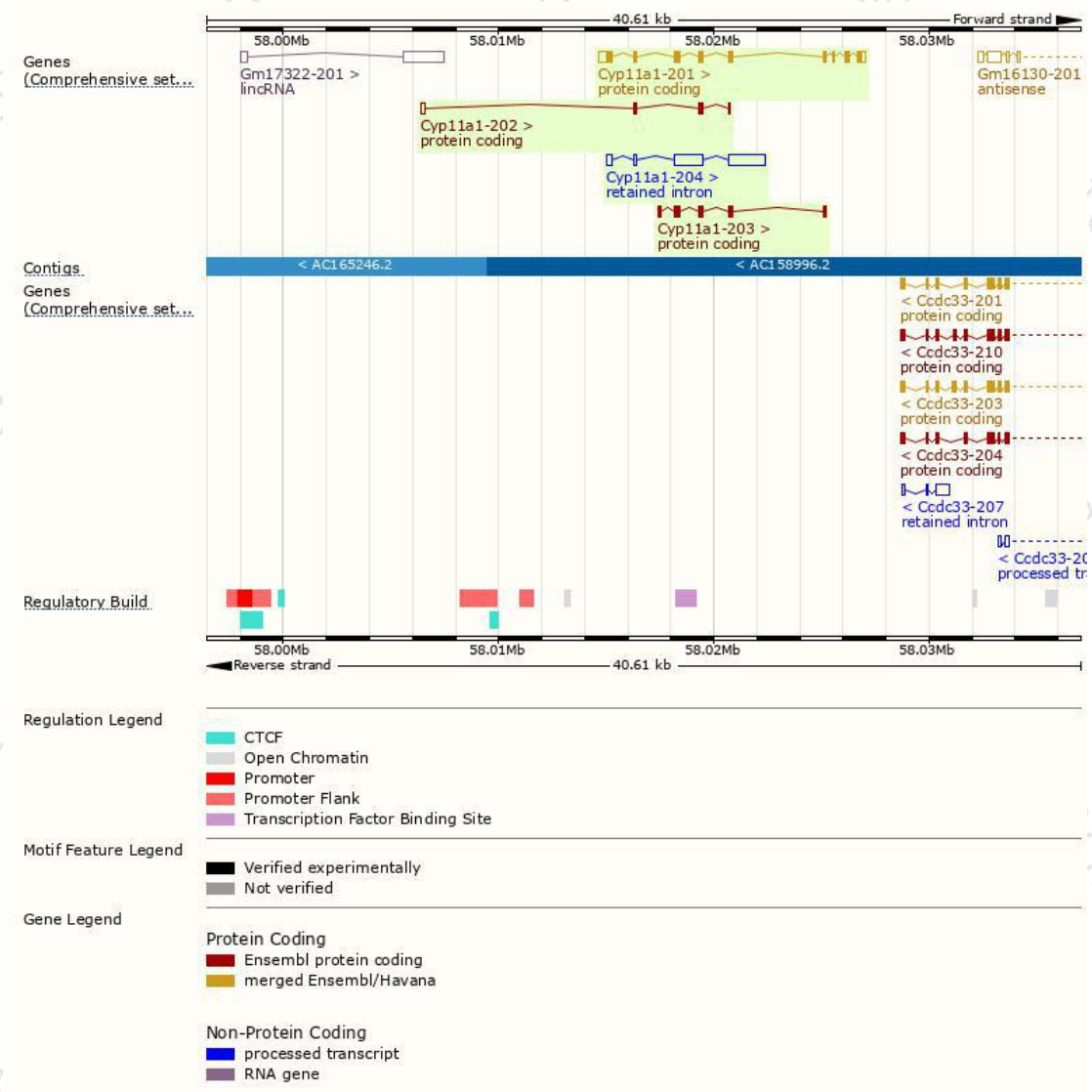
The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Cyp11a1-201	ENSMUST00000034874.13	2120	526aa	Protein coding	CCDS40653	Q9QZ82	TSL:1 GENCODE basic APPRIS P1
Cyp11a1-203	ENSMUST00000188539.1	848	279aa	Protein coding	-	A0A087WRU6	CDS 3' incomplete TSL:2
Cyp11a1-202	ENSMUST00000188116.6	539	115aa	Protein coding	-	A0A087WRA8	CDS 3' incomplete TSL:3
Cyp11a1-204	ENSMUST00000188944.1	3439	No protein	Retained intron	-	-	TSL:1

The strategy is based on the design of *Cyp11a1-201* transcript,The transcription is shown below

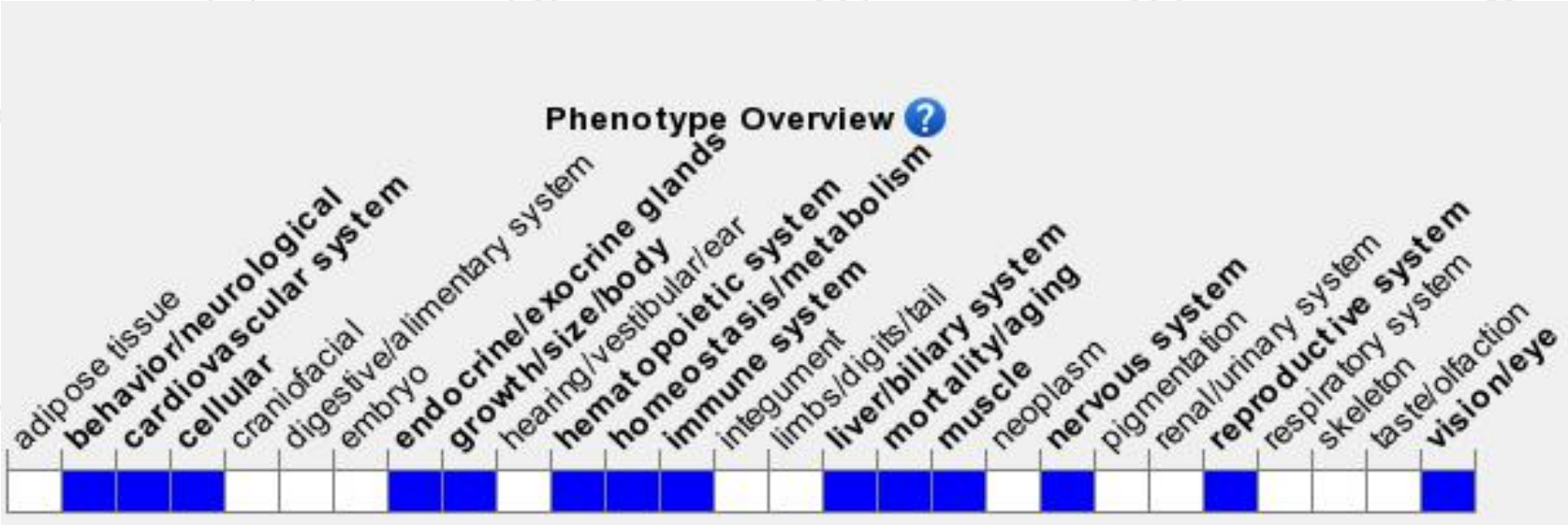


Genomic location distribution



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,Homozygous null mice are exhibit a steroid deficiency and die within days of birth showing signs of dehydration. Males are feminized with female external genitalia and underdeveloped gonads. Mice homozgyous for another knock-out allele exhibit abnormal adrenal development and neonatal lethality.

集萃药康
GemPharmatech

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

Tel: 400-9660890

集萃药康生物科技
GemPharmatech Co.,Ltd