Cdh2 Cas9-CKO Strategy

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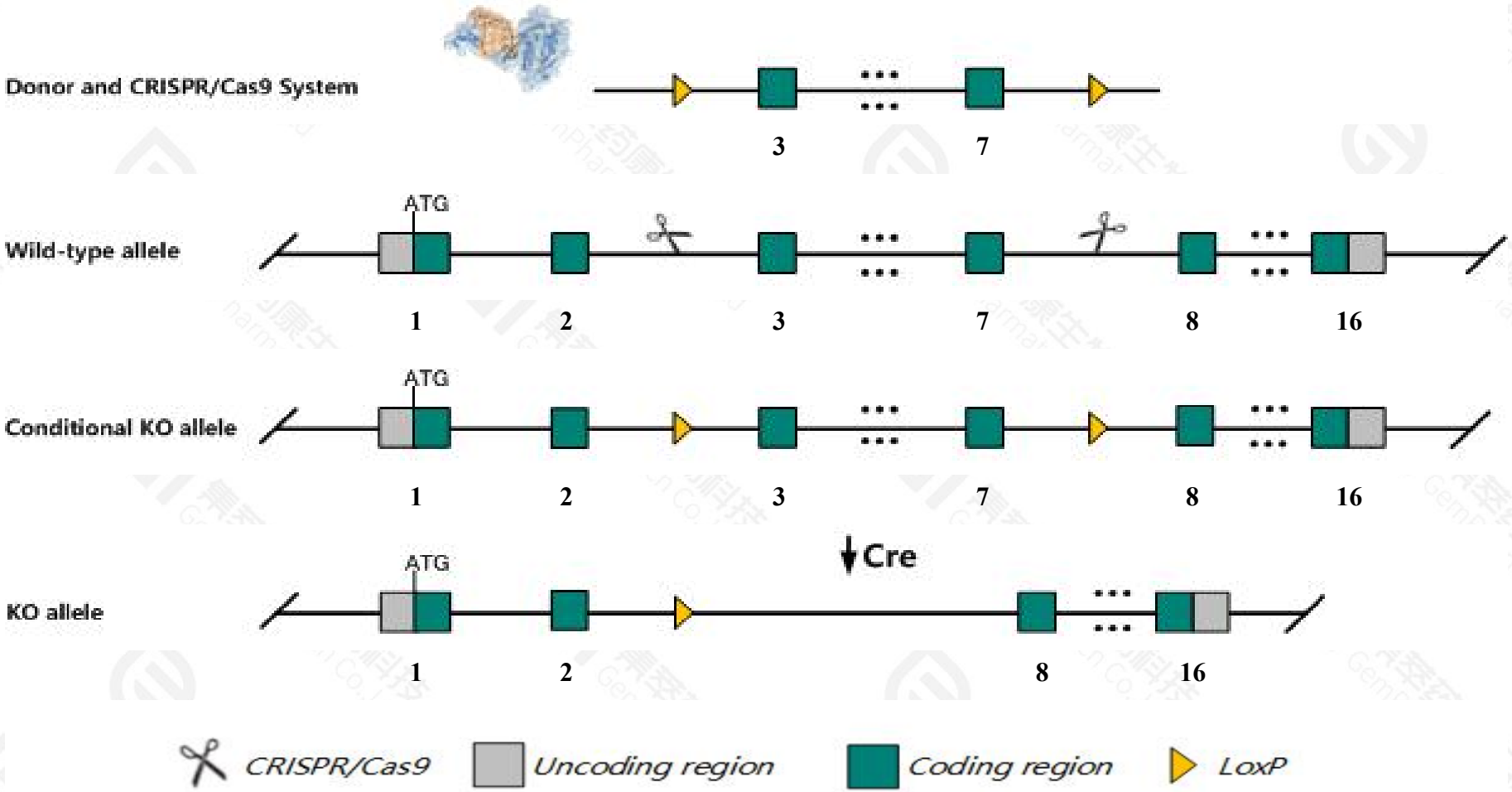
Project Overview

Project Name	***Cdh2***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Cdh2* gene. The schematic diagram is as follows:



Technical routes

➢ The *Cdh2* gene has 3 transcripts. According to the structure of *Cdh2* gene, exon3-exon7 of *Cdh2-201*(ENSMUST00000025166.14) transcript is recommended as the knockout region.The region contains 848bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Cdh2* 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 mutation of this gene results in death by E10. Mutant embryos exhibit several developmental abnormalities such as growth retardation, an enlarged heart, distended pericardial sacs, abnormal heart tube, wavy neural tube, irregular somite shape,and abnormal embryo turning.

➢ The *Cdh2* gene is located on the Chr18. 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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Cdh2 cadherin 2 [Mus musculus (house mouse)]

Gene ID: 12558, updated on 13-Mar-2020

Summary

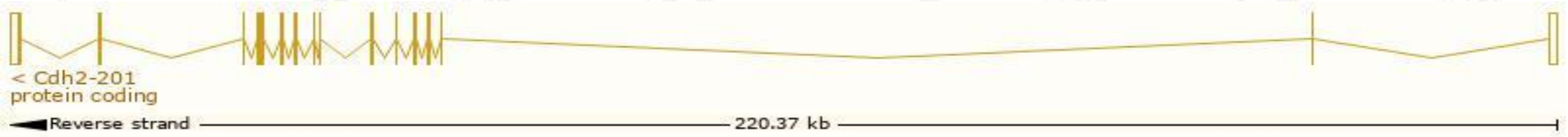
Official Symbol	Cdh2 provided by MGI
Official Full Name	cadherin 2 provided by MGI
Primary source	MGI:MGI:88355
See related	Ensembl:ENSMUSG00000024304
Gene type	protein coding
RefSeq status	REVIEWED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	CDHN, N-CAD, Ncad
Summary	This gene encodes a member of the cadherin family of calcium-dependent glycoproteins that mediate cell adhesion. The encoded preproprotein undergoes proteolytic processing to generate a mature protein. Mice lacking the encoded protein exhibit severe developmental defects resulting in embryonic death. [provided by RefSeq, Oct 2015]
Expression	Biased expression in whole brain E14.5 (RPKM 20.7), CNS E14 (RPKM 19.4) and 14 other tissuesSee more
Orthologs	human all

Transcript information（Ensembl）

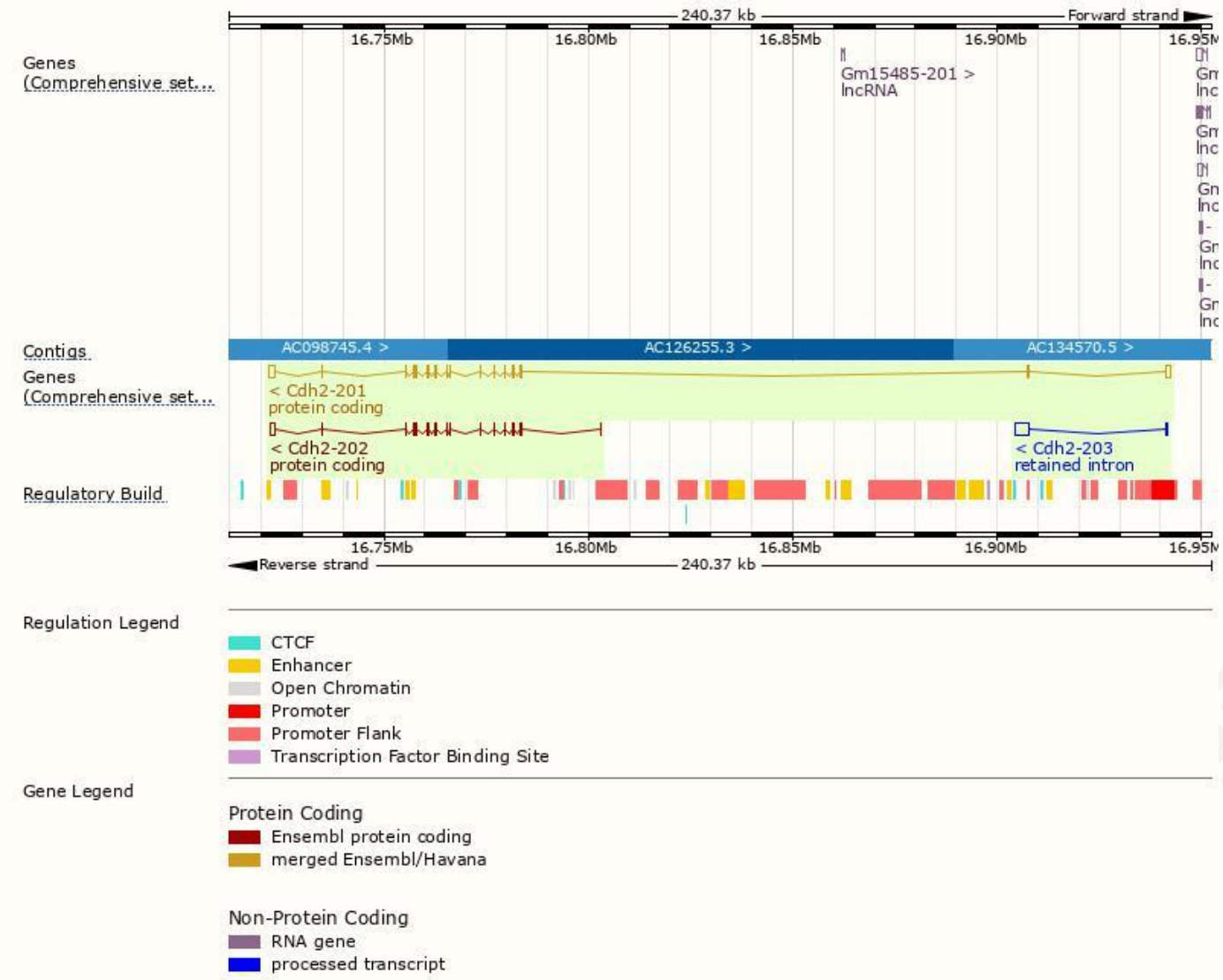
The gene has 3 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Cdh2-201	ENSMUST00000025166.13	4843	906aa	Protein coding	CCDS29076	P15116	TSL:1 GENCODE basic APPRIS is a system to annotate alternatively spliced transcripts based on a range of computational methods to identify the most functionally important transcript(s) of a gene. APPRIS P1
Cdh2-202	ENSMUST00000115850.1	3785	849aa	Protein coding	-	D3YYT0	TSL:5 GENCODE basic
Cdh2-203	ENSMUST00000152779.1	3351	No protein	Retained intron	-	-	TSL:1

The strategy is based on the design of *Cdh2-201* transcript,the transcription is shown below:

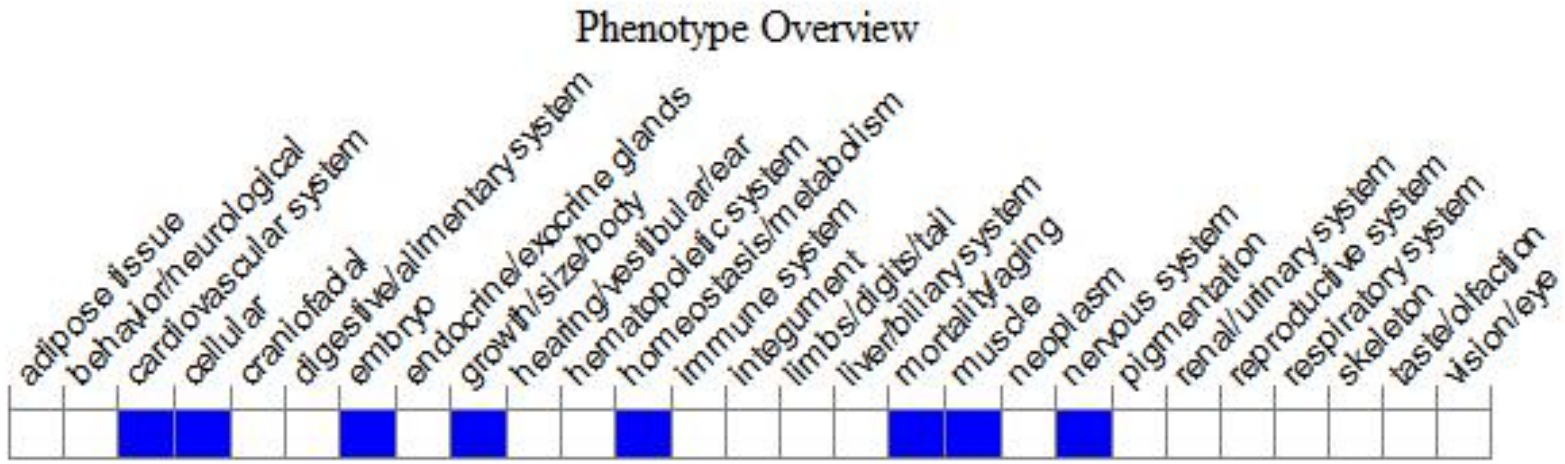


Genomic location distribution



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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