Ctnna1 Cas9-CKO Strategy

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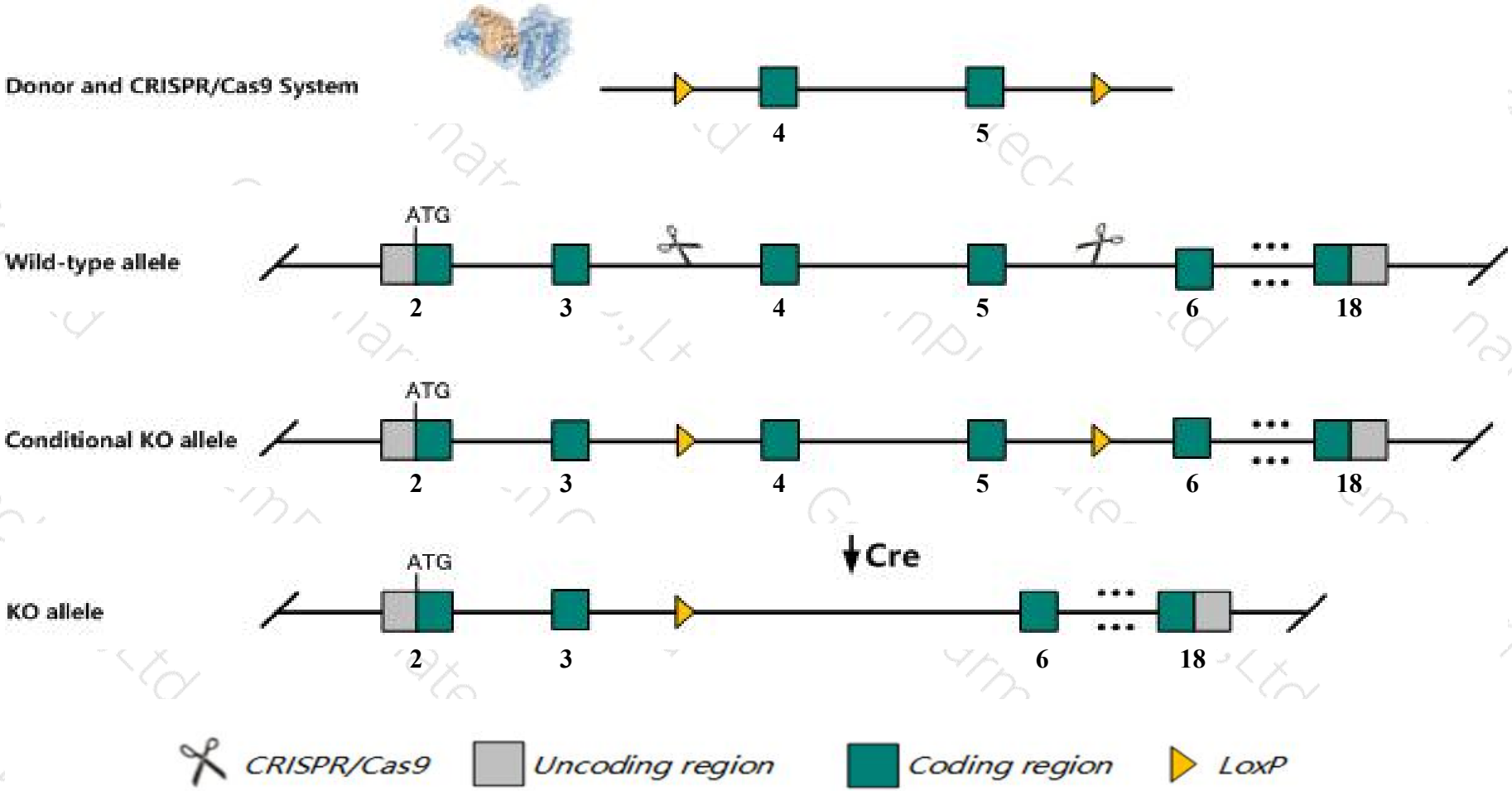
Project Overview

Project Name	***Ctnna1***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Ctnna1* gene. The schematic diagram is as follows:



Technical routes

- The *Ctnna1* gene has 11 transcripts. According to the structure of *Ctnna1* gene, exon4-exon5 of *Ctnna1-201* (ENSMUST00000042345.7) transcript is recommended as the knockout region.The region contains 287bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Ctnna1* 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 embryonic lethality at the blastocyst stage. A conditional knockout in surface epithelium results in defects in hair follicle development and epidermal morphogenesis.

- Transcript *Ctnna1-202* and *Ctnna1-203* may not be affected.

- The *Ctnna1* 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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Ctnna1 catenin (cadherin associated protein), alpha 1 [*Mus musculus* (house mouse)]

Gene ID: 12385, updated on 28-Oct-2019

Summary

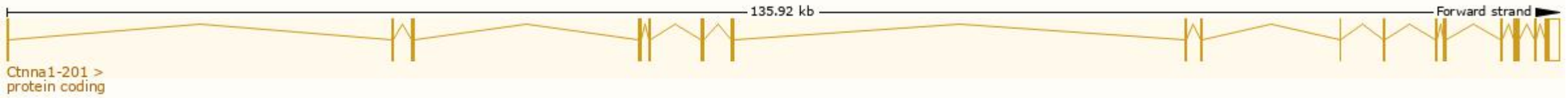
Official Symbol	Ctnna1 provided by MGI
Official Full Name	catenin (cadherin associated protein), alpha 1 provided by MGI
Primary source	MGI:MGI:88274
See related	Ensembl:ENSMUSG00000037815
Gene type	protein coding
RefSeq status	PROVISIONAL
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Catna1; AA517462; AI988031; 2010010M04Rik
Expression	Ubiquitous expression in bladder adult (RPKM 52.1), placenta adult (RPKM 48.2) and 28 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

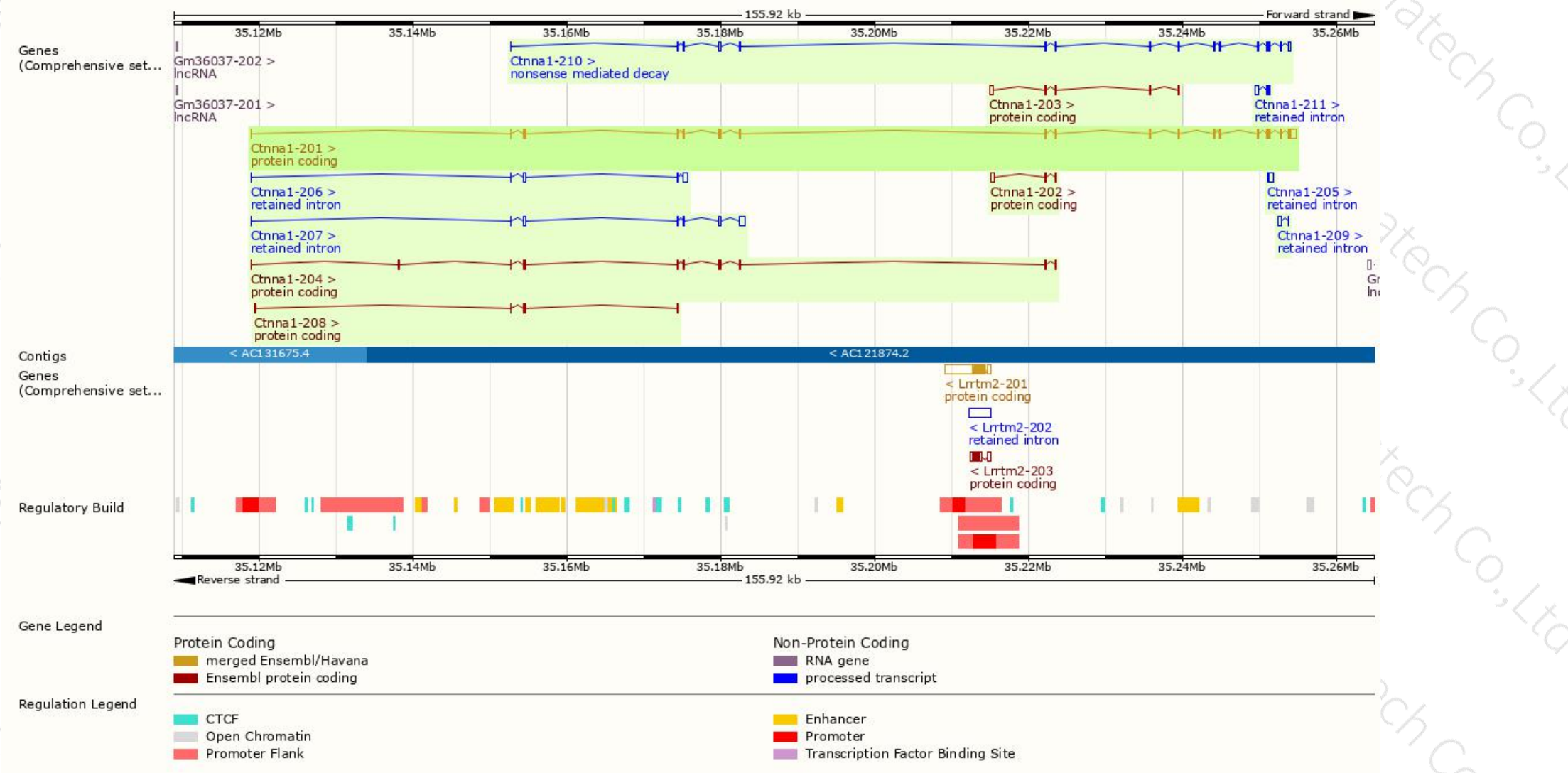
The gene has 11 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Ctnna1-201	ENSMUST00000042345.7	3733	906aa	Protein coding	CCDS29139	P26231 Q545R0	TSL:1 GENCODE basic APPRIS P1
Ctnna1-202	ENSMUST00000235269.1	690	62aa	Protein coding	-	A0A494BBA4	CDS 3' incomplete
Ctnna1-203	ENSMUST00000235449.1	764	122aa	Protein coding	-	A0A494BBB4	CDS 3' incomplete
Ctnna1-204	ENSMUST00000236037.1	1453	415aa	Protein coding	-	A0A494BAD0	CDS 3' incomplete
Ctnna1-205	ENSMUST00000236483.1	658	No protein	Retained intron	-	-	-
Ctnna1-206	ENSMUST00000236571.1	1124	No protein	Retained intron	-	-	-
Ctnna1-207	ENSMUST00000236969.1	1656	No protein	Retained intron	-	-	-
Ctnna1-208	ENSMUST00000237154.1	519	156aa	Protein coding	-	A0A494BAM5	CDS 3' incomplete
Ctnna1-209	ENSMUST00000237475.1	545	No protein	Retained intron	-	-	-
Ctnna1-210	ENSMUST00000237855.1	2542	37aa	Nonsense mediated decay	-	A0A494BA24	-
Ctnna1-211	ENSMUST00000238145.1	667	No protein	Retained intron	-	-	-

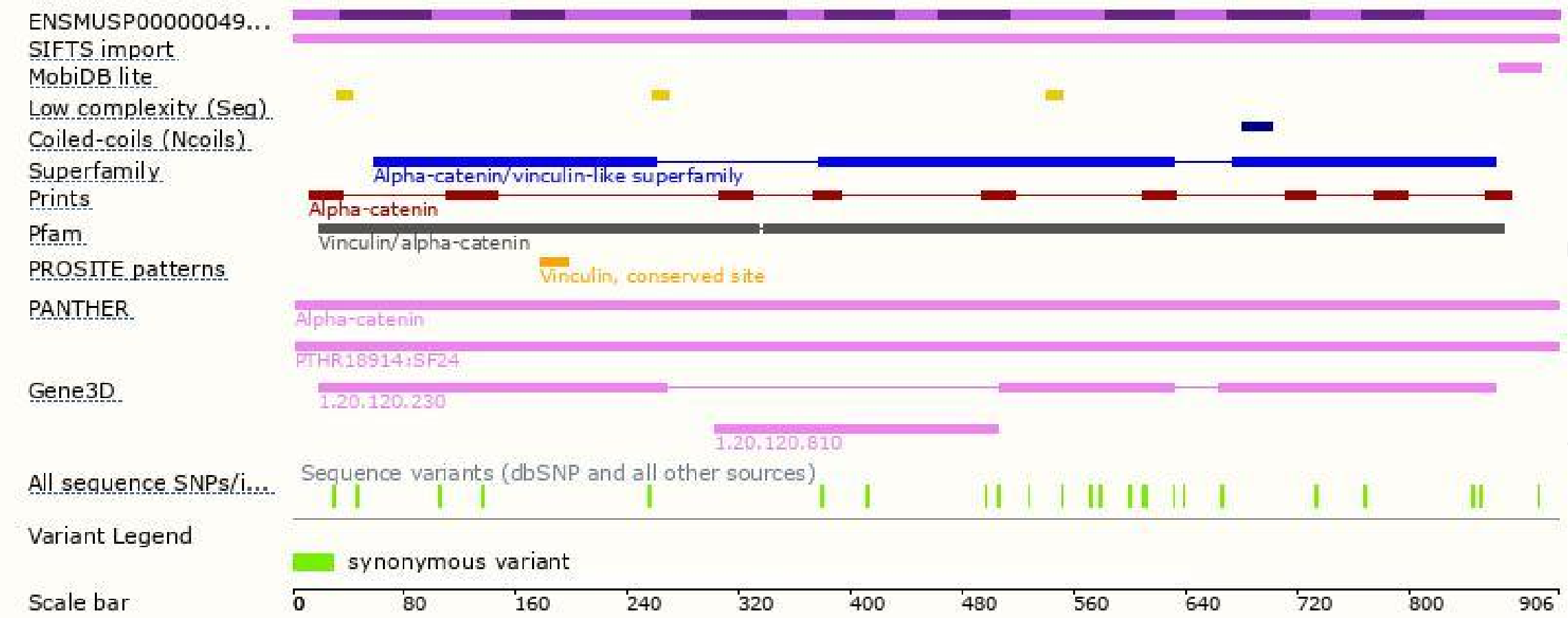
The strategy is based on the design of *Ctnna1-201* transcript, the transcription is shown below



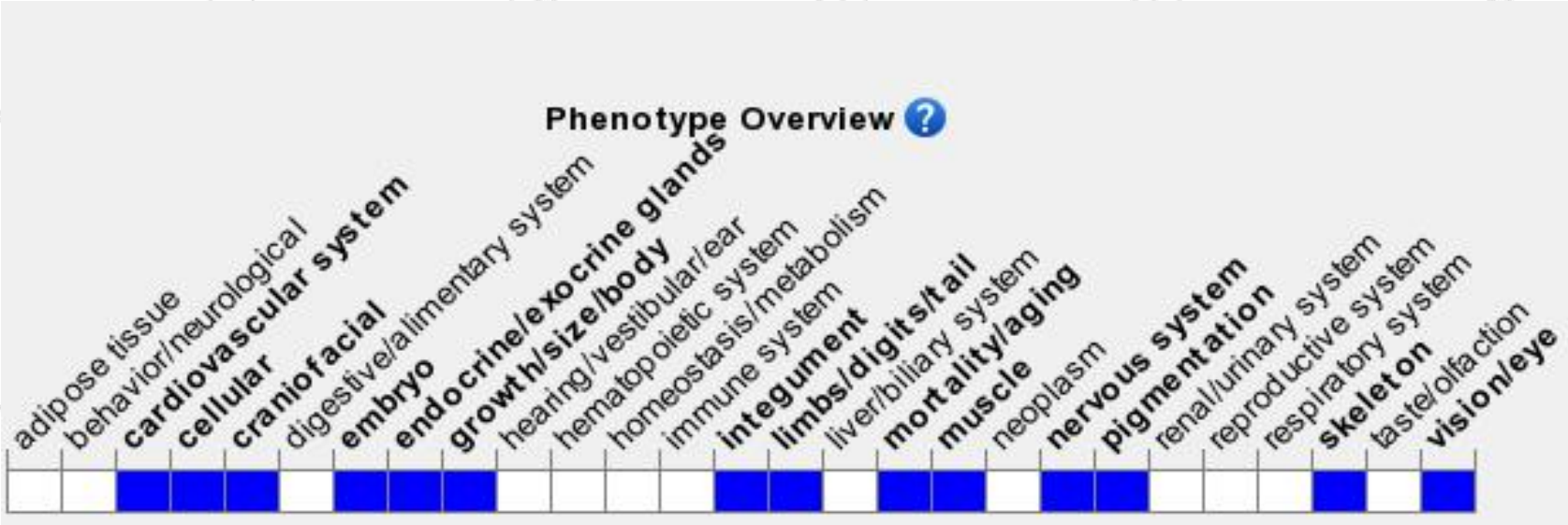
Genomic location distribution



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 mutation of this gene results in embryonic lethality at the blastocyst stage. A conditional knockout in surface epithelium results in defects in hair follicle development and epidermal morphogenesis.

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

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