

Hdac2 Cas9-CKO Strategy

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Reviewer:

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Project Overview

Project Name

Hdac2

Project type

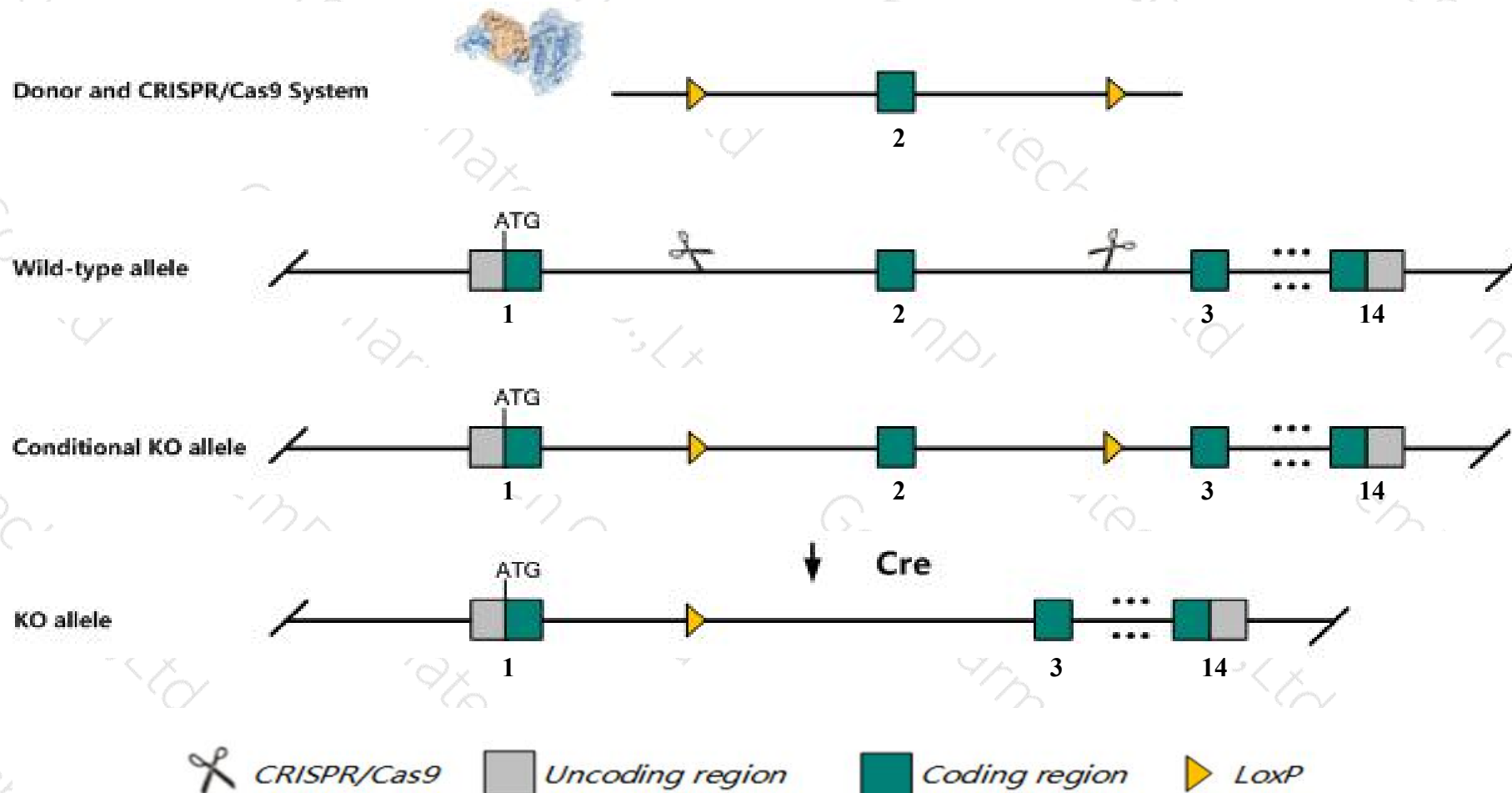
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Hdac2* gene. The schematic diagram is as follows:



Technical routes

- The *Hdac2* gene has 4 transcripts. According to the structure of *Hdac2* gene, exon2 of *Hdac2-201* (ENSMUST00000019911.13) transcript is recommended as the knockout region. The region contains 113bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Hdac2* 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.

- According to the existing MGI data, Mice homozygous for a null allele exhibit embryonic and postnatal lethality accompanied with a transient decrease in body size and increase in heart size and cardiomyocyte proliferation that is overcome by 2 months of age in surviving mice.
- The *Hdac2* gene is located on the Chr10. 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)

Hdac2 histone deacetylase 2 [Mus musculus (house mouse)]

Gene ID: 15182, updated on 25-Mar-2019

Summary



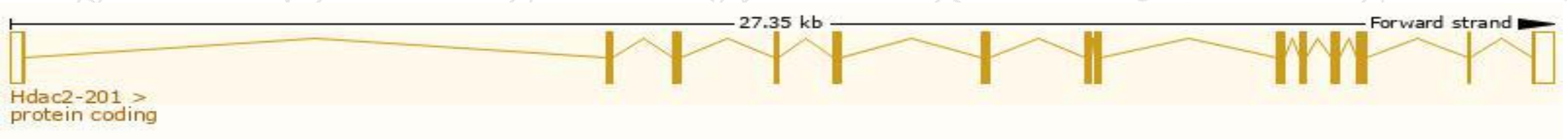
Official Symbol	Hdac2 provided by MGI
Official Full Name	histone deacetylase 2 provided by MGI
Primary source	MGI:MGI:1097691
See related	Ensembl:ENSMUSG00000019777
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	D10Wsu179e, YAF1, Yy1bp, mRPD3
Expression	Broad expression in CNS E11.5 (RPKM 72.6), CNS E14 (RPKM 53.5) and 19 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

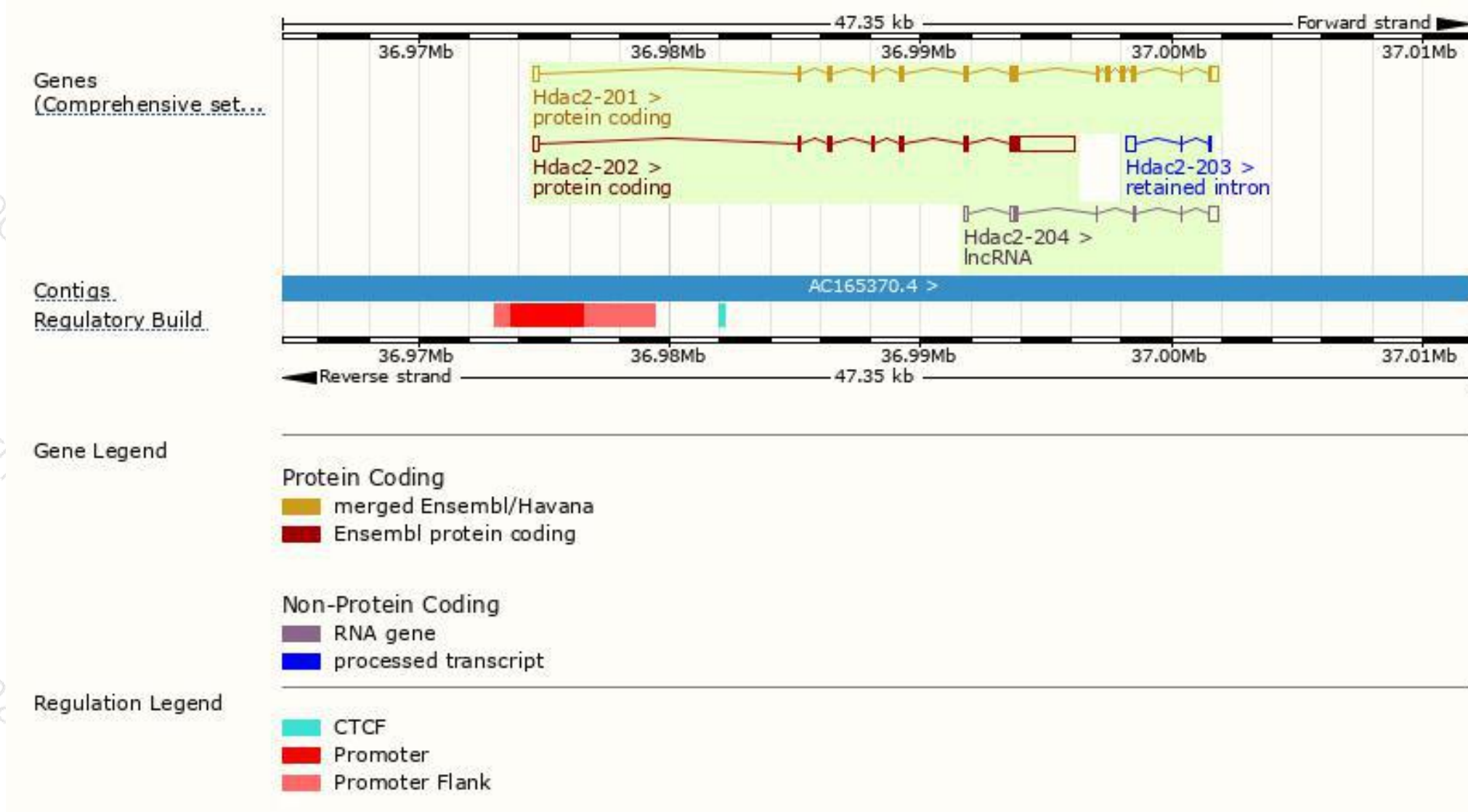
The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Hdac2-201	ENSMUST00000019911.13	2005	488aa	Protein coding	CCDS23783	A0A0R4J008	TSL:1 GENCODE basic APPRIS P1
Hdac2-202	ENSMUST00000105510.1	3250	304aa	Protein coding	-	Q8BQ10	TSL:1 GENCODE basic
Hdac2-203	ENSMUST00000123010.1	539	No protein	Retained intron	-	-	TSL:2
Hdac2-204	ENSMUST00000128031.7	906	No protein	lncRNA	-	-	TSL:5

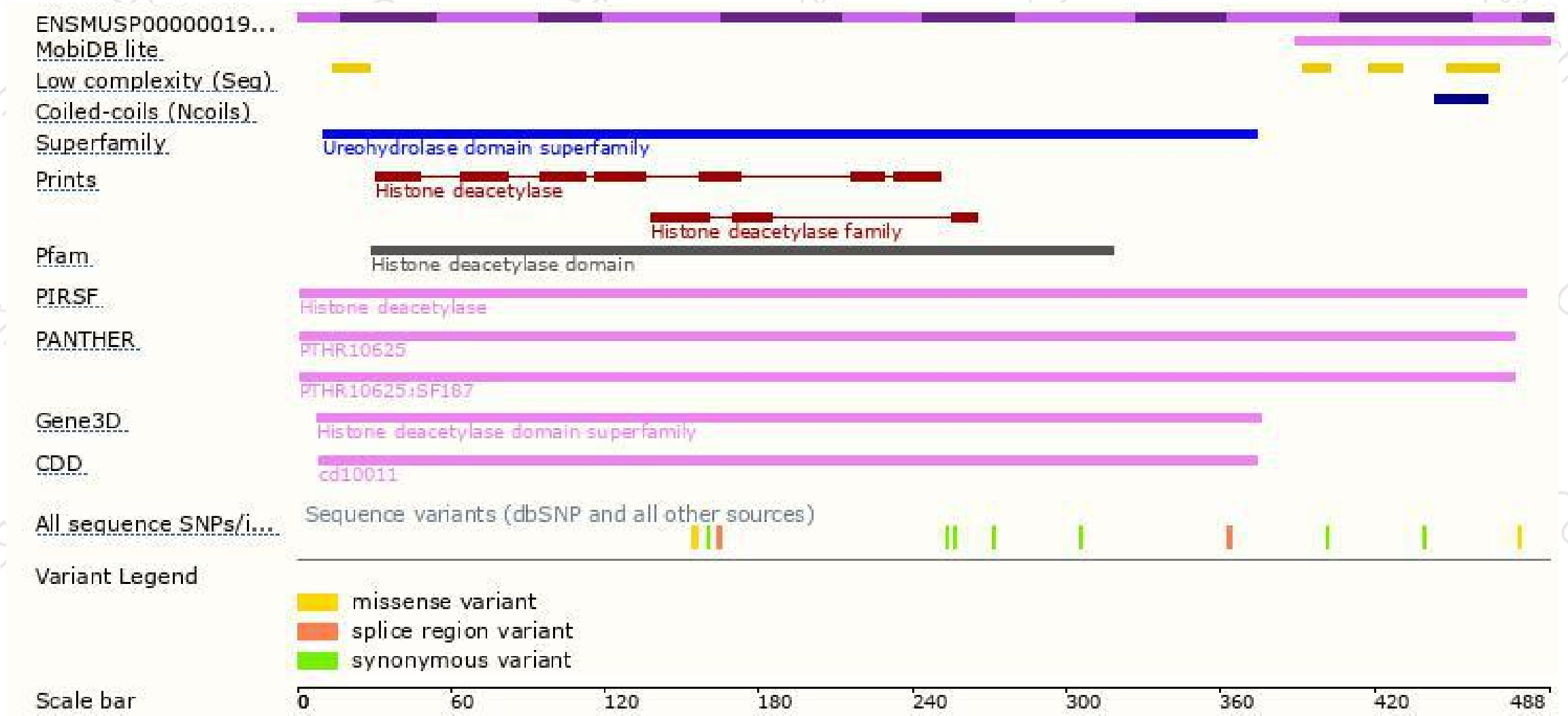
The strategy is based on the design of *Hdac2-201* transcript,The transcription is shown below



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 null allele exhibit embryonic and postnatal lethality accompanied with a transient decrease in body size and increase in heart size and cardiomyocyte proliferation that is overcome by 2 months of age in surviving mice.

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

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