

Hdac5 Cas9-CKO Strategy

Designer:

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Project Overview

Project Name

Hdac5

Project type

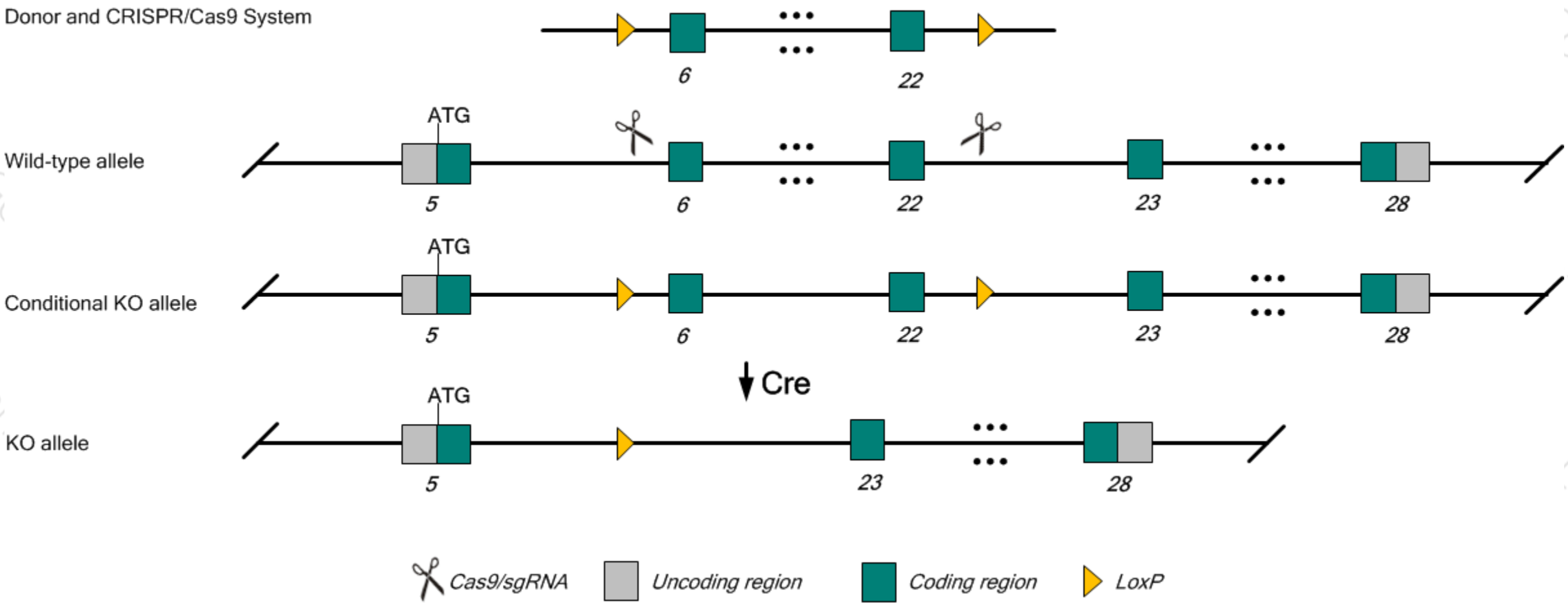
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Hdac5* gene. The schematic diagram is as follows:



- The *Hdac5* gene has 20 transcripts, According to the structure of *Hdac5* gene, exon6-22 of *Hdac5-201* transcript is recommended as the knockout region. The region contains the 2489bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Hdac5* gene. The brief process is as follows: sgRNA was transcribed in vitro, donor vector was constructed. Cas9, sgRNA 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 was knocked out after mating with mice expressing Cre recombinase, resulting in the loss of function of the target gene in specific tissues or cell types.

- According to the existing MGI data , Homozygous null mice are viable and display cardiac hypertrophy.
- Transcript *Hdac5-206* , *Hdac5-208* , *Hdac5-211* , *Hdac5-212* , *Hdac5-215* , *Hdac5-218* may not be affected. The impact on Transcript *Hdac5-214* is unknown.
- The *Hdac5* gene is located in the Chr11. 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 the loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

Gene information (NCBI)

Hdac5 histone deacetylase 5 [*Mus musculus* (house mouse)]

Gene ID: 15184, updated on 31-Jan-2019

Summary

Official Symbol	Hdac5 provided by MGI
Official Full Name	histone deacetylase 5 provided by MGI
Primary source	MGI:MGI:1333784
See related	Ensembl:ENSMUSG000000008855
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	Hdac4; mHDA1; AI426555; mKIAA0600
Expression	Ubiquitous expression in lung adult (RPKM 20.5), adrenal adult (RPKM 19.0) and 28 other tissues See more
Orthologs	human all

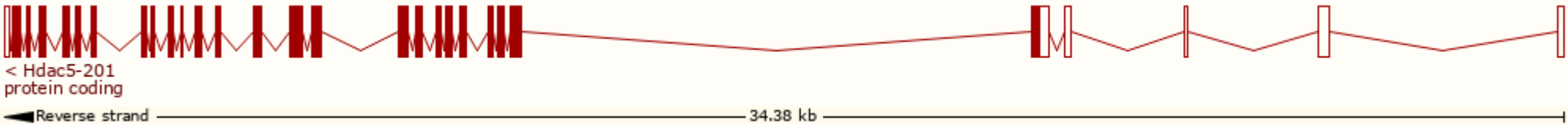
Transcript information (Ensembl)



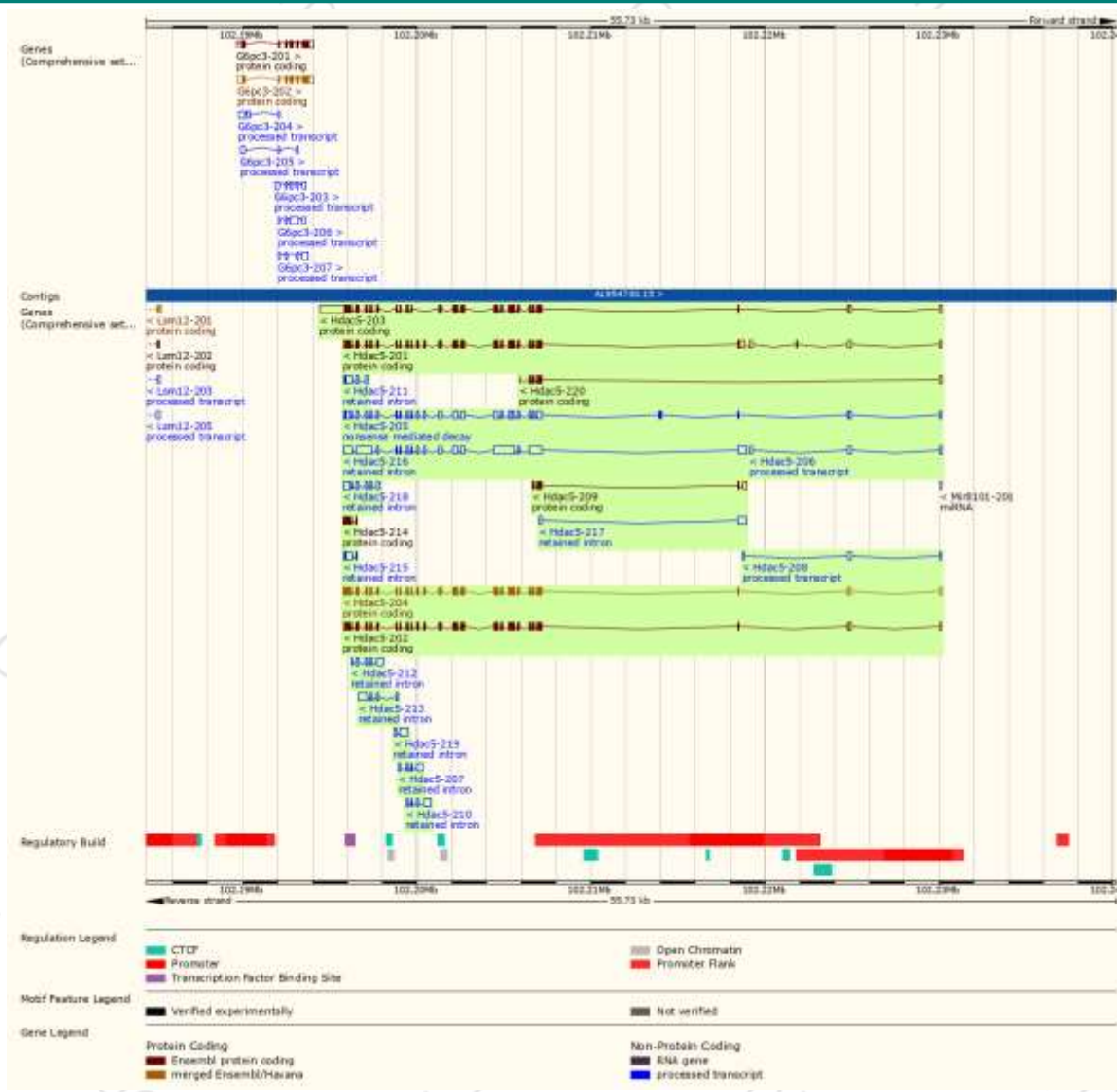
The gene has 20 transcripts, and all transcripts are shown below :

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	RefSeq	Flags
Hdac5-201	ENSMUST0000008999.11	4269	1121aa	Protein coding	CCDS70320	B7ZDF5	NM_001284248 NP_001271177	TSL:1 GENCODE basic APPRIS ALT2
Hdac5-204	ENSMUST00000107152.8	3788	1115aa	Protein coding	CCDS36341	Q3UJF1	NM_001077696 NM_001284249 NM_010412 NP_001071164 NP_001271178 NP_034542	TSL:1 GENCODE basic APPRIS P3
Hdac5-202	ENSMUST00000107150.7	3759	1102aa	Protein coding	CCDS70321	B7ZDF7	NM_001284250 NP_001271179	TSL:1 GENCODE basic APPRIS ALT2
Hdac5-203	ENSMUST00000107151.8	4852	1030aa	Protein coding	-	A2AWS5	-	TSL:5 GENCODE basic
Hdac5-209	ENSMUST00000131254.1	721	158aa	Protein coding	-	B7ZDF6	-	CDS 3' incomplete TSL:3
Hdac5-220	ENSMUST00000156337.1	692	175aa	Protein coding	-	B7ZDF4	-	CDS 3' incomplete TSL:5
Hdac5-214	ENSMUST00000140962.7	427	142aa	Protein coding	-	B7ZDF3	-	CDS 5' and 3' incomplete TSL:5
Hdac5-205	ENSMUST00000124077.7	3872	64aa	Nonsense mediated decay	-	D6RH93	NM_001361596 NP_001348525	TSL:1
Hdac5-206	ENSMUST00000125072.1	493	No protein	Processed transcript	-	-	-	TSL:2
Hdac5-208	ENSMUST00000128686.7	422	No protein	Processed transcript	-	-	-	TSL:3
Hdac5-216	ENSMUST00000149087.7	5406	No protein	Retained intron	-	-	-	TSL:1
Hdac5-218	ENSMUST00000150965.7	1008	No protein	Retained intron	-	-	-	TSL:1
Hdac5-212	ENSMUST00000137787.7	851	No protein	Retained intron	-	-	-	TSL:3
Hdac5-213	ENSMUST00000140481.1	814	No protein	Retained intron	-	-	-	TSL:3
Hdac5-211	ENSMUST00000136304.7	754	No protein	Retained intron	-	-	-	TSL:3
Hdac5-219	ENSMUST00000155065.1	695	No protein	Retained intron	-	-	-	TSL:3
Hdac5-210	ENSMUST00000133651.1	672	No protein	Retained intron	-	-	-	TSL:5
Hdac5-217	ENSMUST00000150683.1	650	No protein	Retained intron	-	-	-	TSL:2
Hdac5-207	ENSMUST00000126453.7	644	No protein	Retained intron	-	-	-	TSL:2
Hdac5-215	ENSMUST00000145540.1	537	No protein	Retained intron	-	-	-	TSL:3

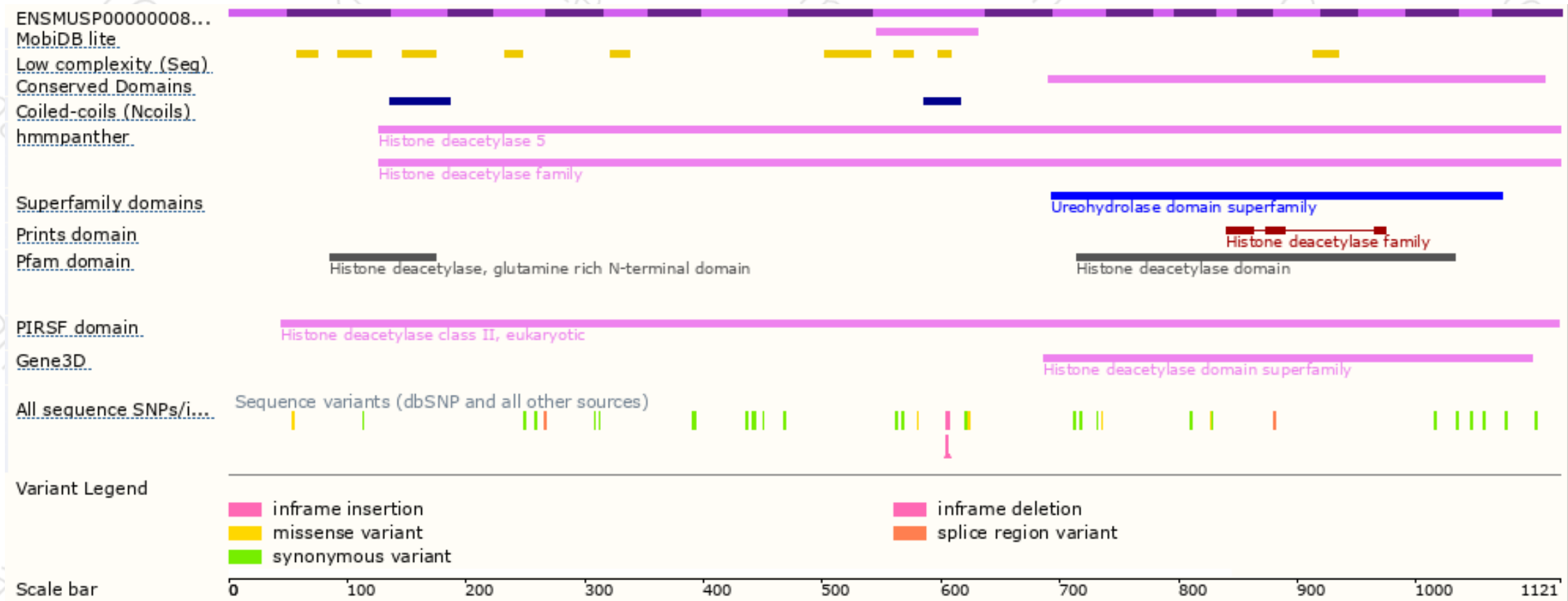
The strategy is based on the design of *Hdac5-201* transcript, The transcription is shown below



Genomic location distribution



Protein domain



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