Hdac4 Cas9-KO Strategy

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Project Overview

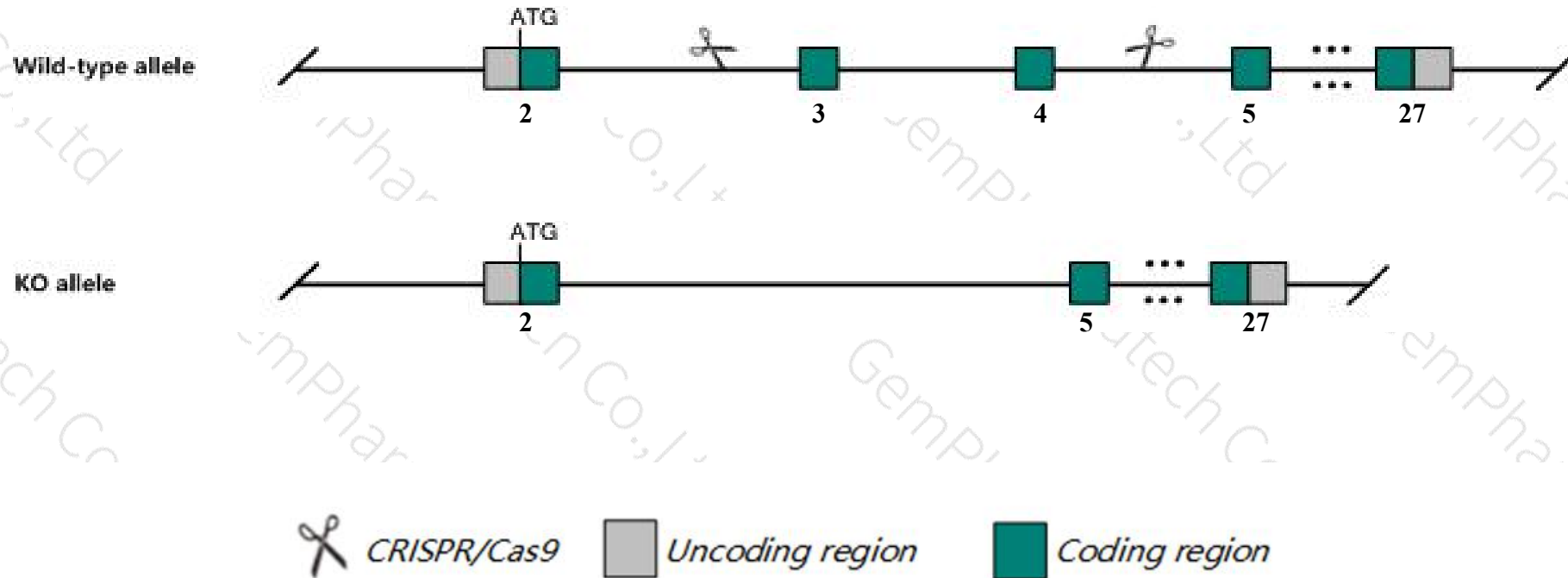|	
Project Name	*Hdac4*
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Hdac4* gene. The schematic diagram is as follows:

Technical routes

➢ The *Hdac4* gene has 12 transcripts. According to the structure of *Hdac4* gene, exon3-exon4 of *Hdac4-202* (ENSMUST00000097644.8) transcript is recommended as the knockout region.The region contains 314bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Hdac4* gene. The brief process is as follows: CRISPR/Cas9 system

Notice

➤ According to the existing MGI data,Mice homozygous for a gene trap allele exhibit increased thermal nociception threshold and seizures. Mice homozygous for a knock-out allele exhibit postnatal lethality, exencephaly, and abnormal skeleton morphology and physiology.

➤ Transcript *Hdac4*-206 may not be affected.

➤ The *Hdac4* gene is located on the Chr1. 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 gene knockout on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

Gene information （NCBI）

Hdac4 histone deacetylase 4 [Mus musculus (house mouse)]

Gene ID: 208727, updated on 19-Mar-2019

Summary

|	
Official Symbol	Hdac4 provided by MGI
Official Full Name	histone deacetylase 4 provided by MGI
Primary source	MGI:MGI:3036234
See related	Ensembl:ENSMUSG00000026313
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	4932408F19Rik, HD4
Expression	Ubiquitous expression in adrenal adult (RPKM 12.3), ovary adult (RPKM 10.9) and 28 other tissuesSee more
Orthologs	human all

Transcript information（Ensembl）

The gene has 12 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Hdac4-202	ENSMUST00000097644.8	8100	1076aa	Protein coding	CCDS48324	Q6NZM9	TSL:1 GENCODE basic APPRIS P1
Hdac4-201	ENSMUST00000008995.14	3937	1076aa	Protein coding	CCDS48324	Q6NZM9	TSL:1 GENCODE basic APPRIS P1
Hdac4-206	ENSMUST00000187308.1	938	312aa	Protein coding	-	A0A087WQ92	CDS 5' and 3' incomplete TSL:5
Hdac4-205	ENSMUST00000186002.2	849	112aa	Protein coding	-	A0A087WSF0	CDS 3' incomplete TSL:3
Hdac4-209	ENSMUST00000189730.1	3576	No protein	Retained intron	-	-	TSL:NA
Hdac4-203	ENSMUST00000185267.1	3191	No protein	Retained intron	-	-	TSL:NA
Hdac4-210	ENSMUST00000191327.1	589	No protein	Retained intron	-	-	TSL:2
Hdac4-208	ENSMUST00000189303.6	3287	No protein	lncRNA	-	-	TSL:1
Hdac4-212	ENSMUST00000212867.1	797	No protein	lncRNA	-	-	TSL:5
Hdac4-211	ENSMUST00000212408.1	650	No protein	lncRNA	-	-	TSL:5
Hdac4-207	ENSMUST00000187622.1	410	No protein	lncRNA	-	-	TSL:3
Hdac4-204	ENSMUST00000185341.6	407	No protein	lncRNA	-	-	TSL:2

The strategy is based on the design of *Hdac4-202* transcript,The transcription is shown below

< Hdac4-202
protein coding

◄ Reverse strand ─────────── 251.56 kb ───────────
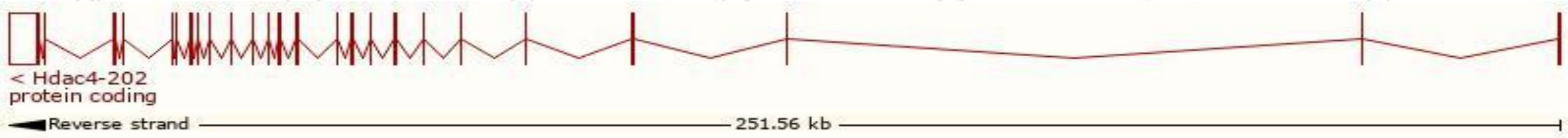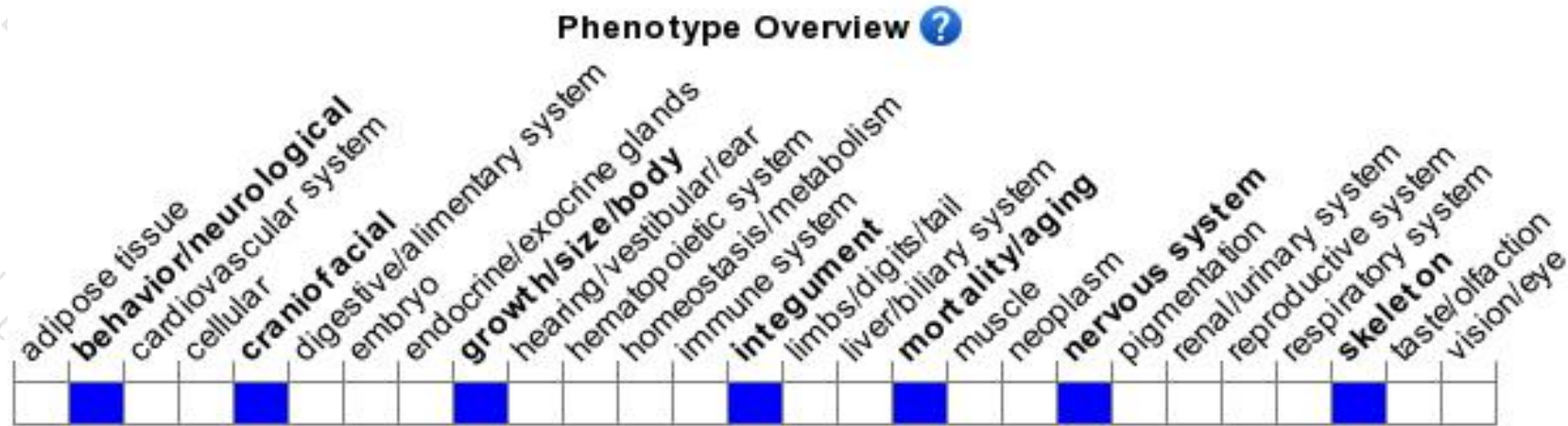
Genomic location distribution
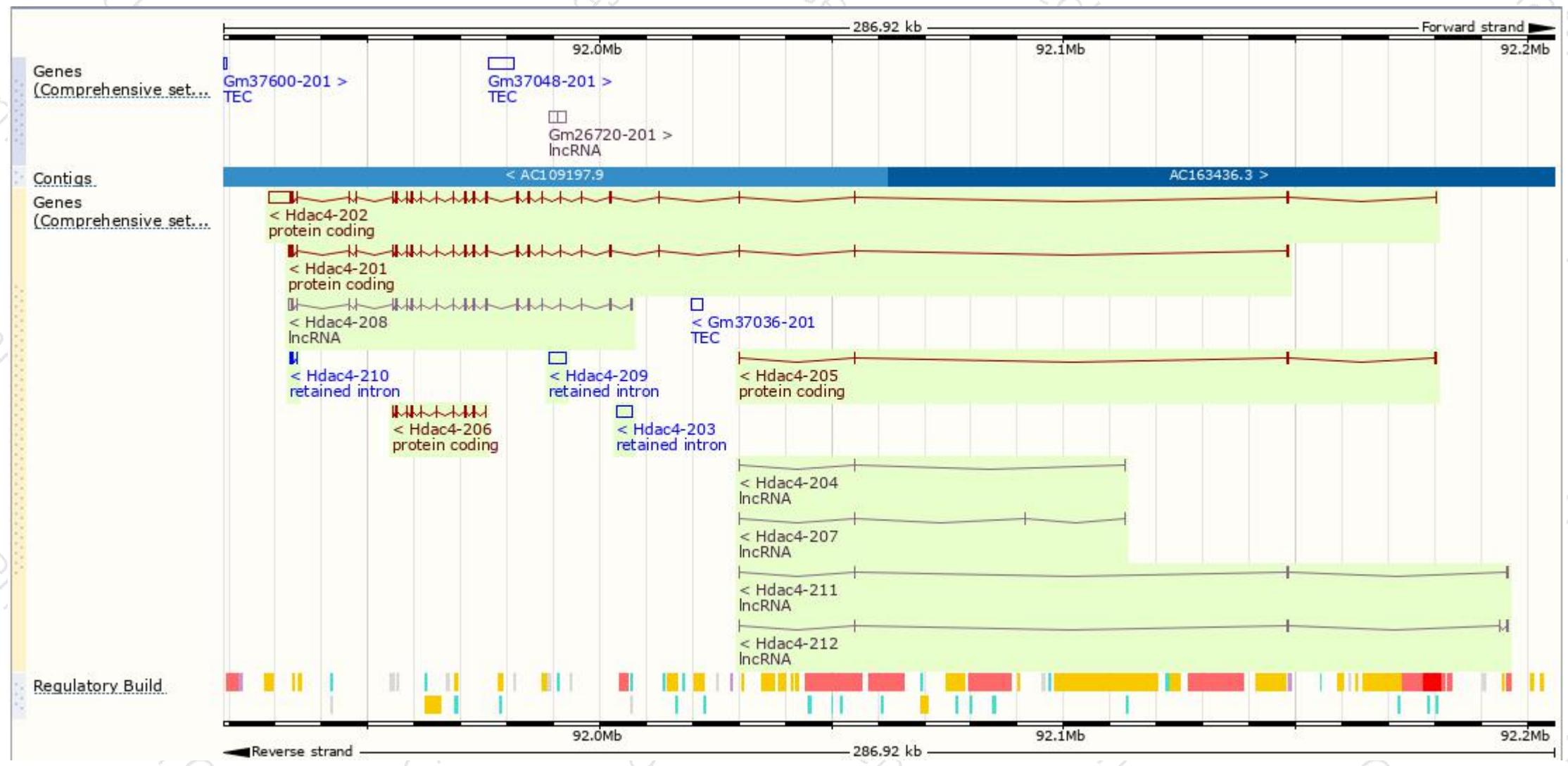
Protein domain
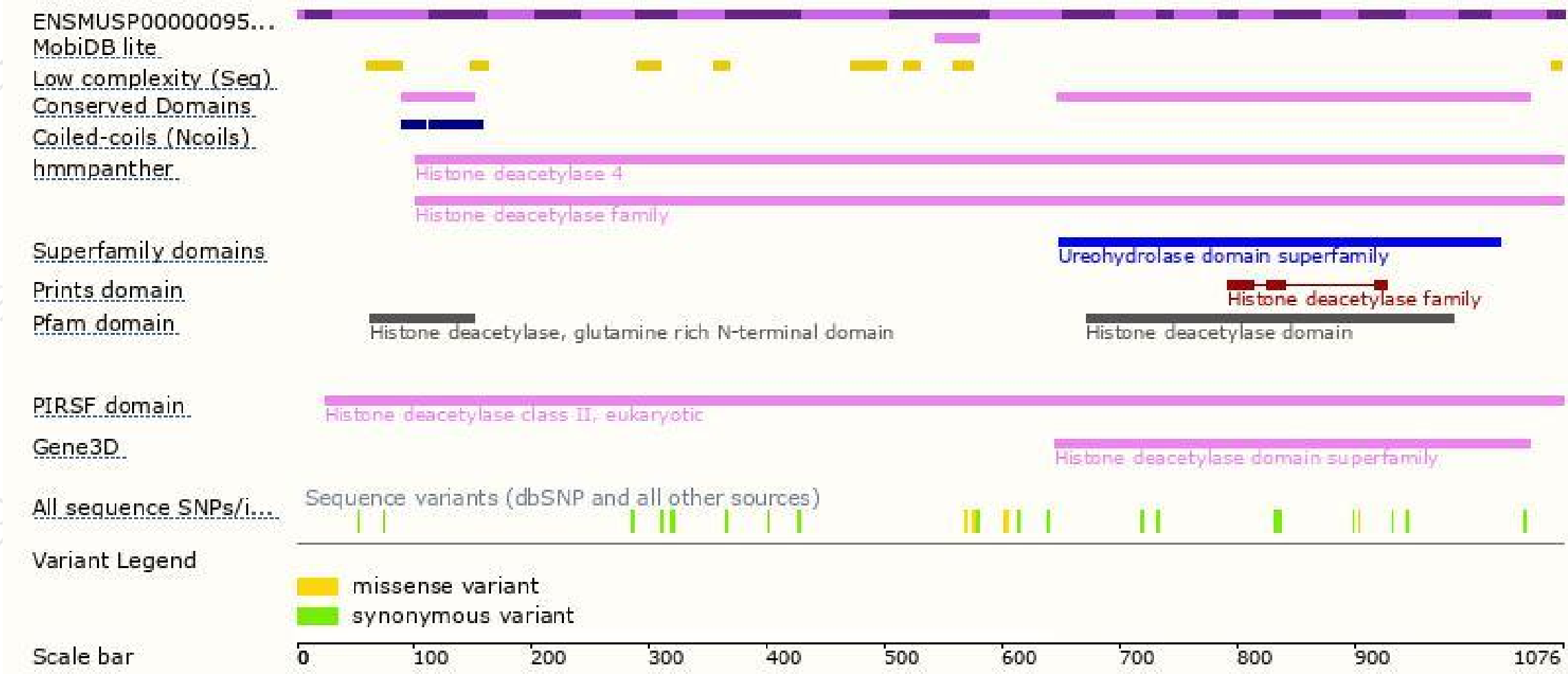
Mouse phenotype description(MGI)

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 gene trap allele exhibit increased thermal nociception threshold and seizures. Mice homozygous for a knock-out allele exhibit postnatal lethality, exencephaly, and abnormal skeleto morphology and physiology.

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