Hacd1 Cas9-CKO Strategy

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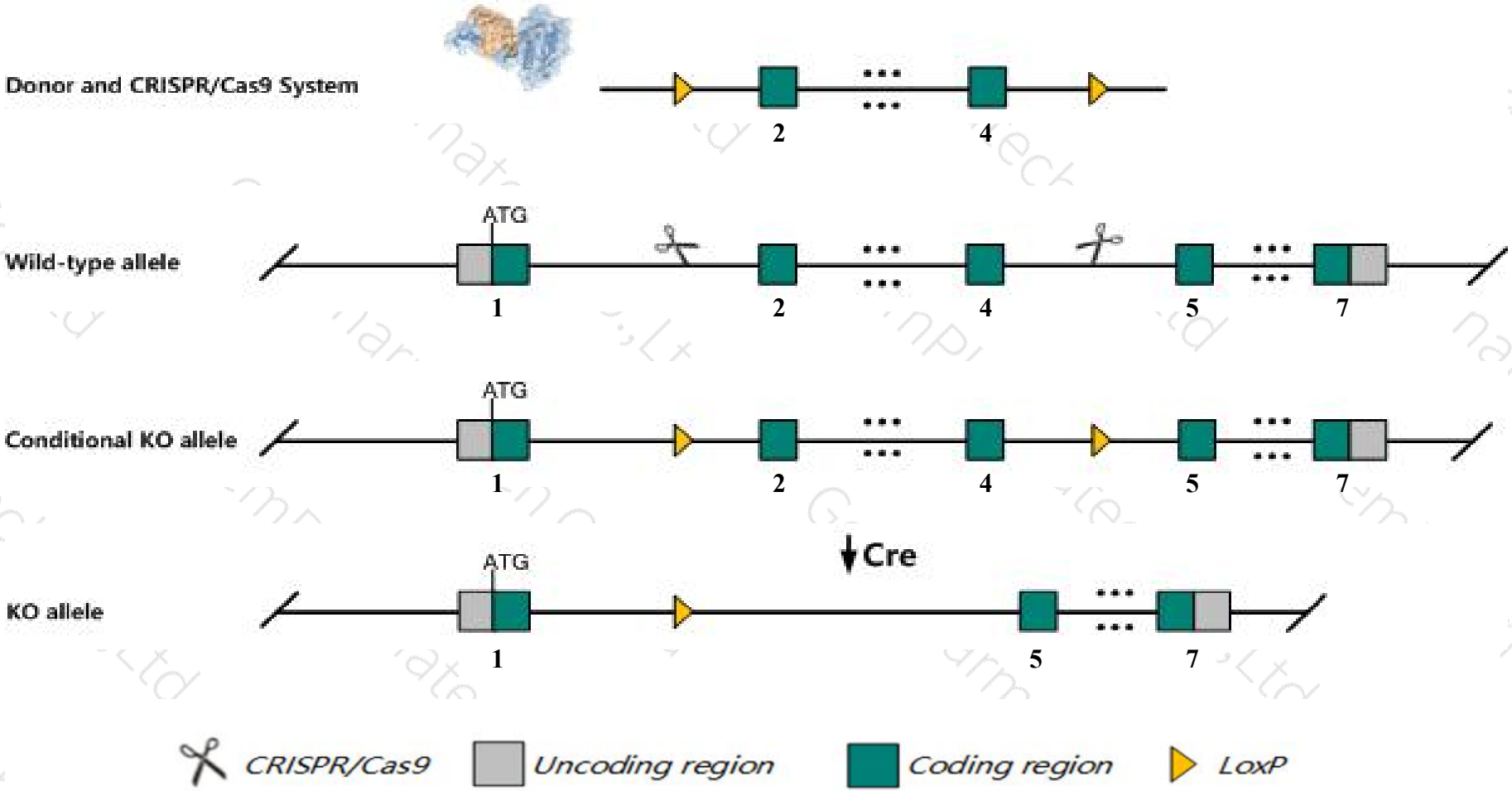
Project Overview

Project Name	***Hacd1***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Hacd1* gene. The schematic diagram is as follows:



Technical routes

- The *Hacd1* gene has 4 transcripts. According to the structure of *Hacd1* gene, exon2-exon4 of *Hacd1-203* (ENSMUST00000114753.7) transcript is recommended as the knockout region.The region contains 226bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Hacd1* 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 knockout leads to decreased body size and weight and reduced skeletal muscle weight.

- The *Hacd1* gene is located on the Chr2. 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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Hacd1 3-hydroxyacyl-CoA dehydratase 1 [Mus musculus (house mouse)]

Gene ID: 30963, updated on 3-Feb-2019

Summary

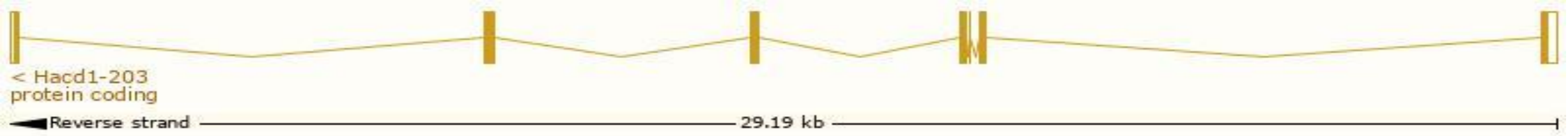
Official Symbol	Hacd1 provided by MGI
Official Full Name	3-hydroxyacyl-CoA dehydratase 1 provided by MGI
Primary source	MGI:MGI:1353592
See related	Ensembl:ENSMUSG00000063275
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Ptpla
Expression	Ubiquitous expression in bladder adult (RPKM 8.8), heart adult (RPKM 5.9) and 28 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

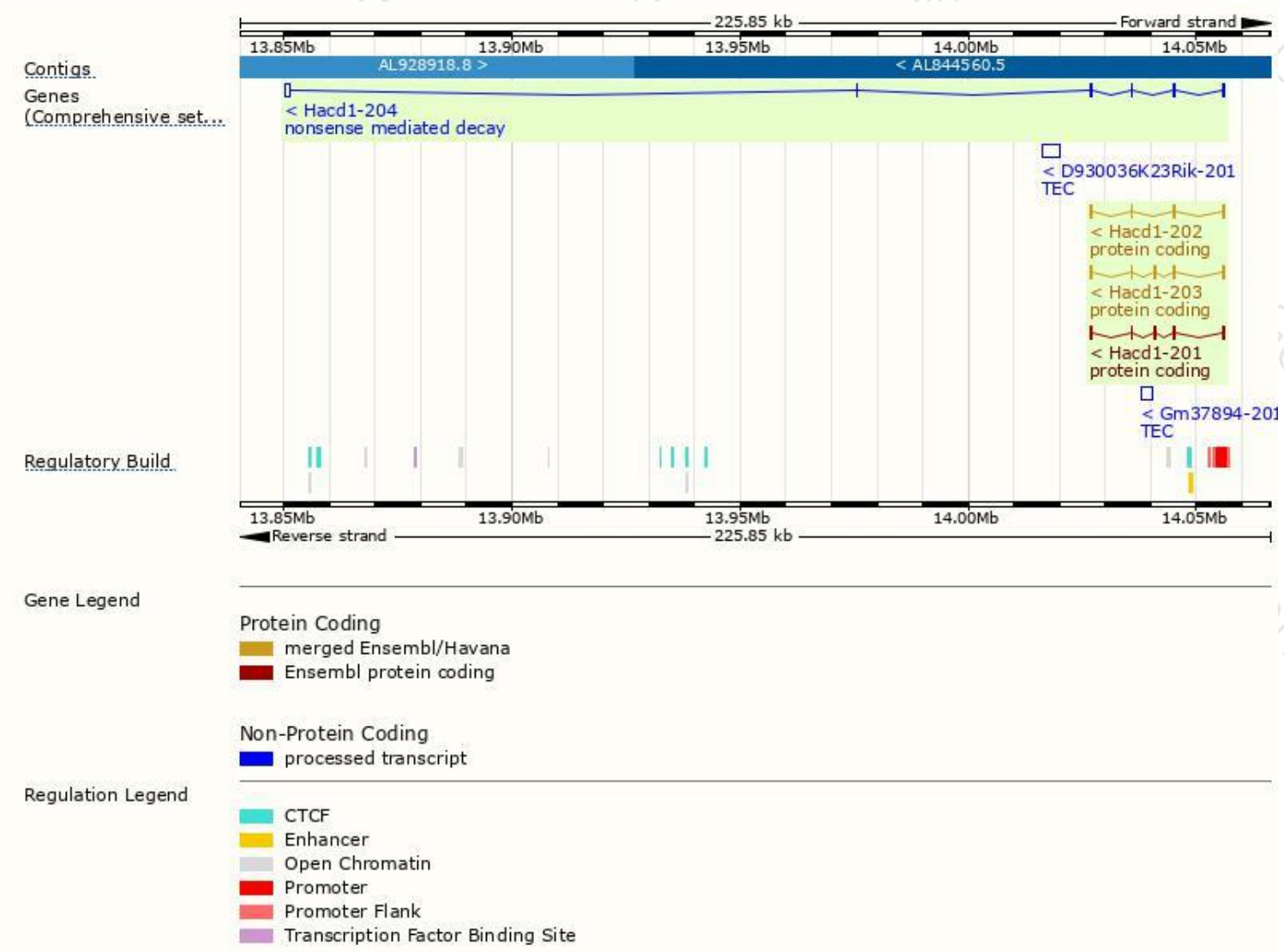
The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Hacd1-203	ENSMUST00000114753.7	993	248aa	Protein coding	CCDS50505	B9EHK9	TSL:1 GENCODE basic APPRIS P1
Hacd1-201	ENSMUST00000074854.8	926	248aa	Protein coding	CCDS50505	B9EHK9	TSL:5 GENCODE basic APPRIS P1
Hacd1-202	ENSMUST00000091429.11	871	165aa	Protein coding	CCDS50504	A2AQ81	TSL:1 GENCODE basic
Hacd1-204	ENSMUST00000131730.6	1876	165aa	Nonsense mediated decay	CCDS50504	A2AQ81	TSL:1

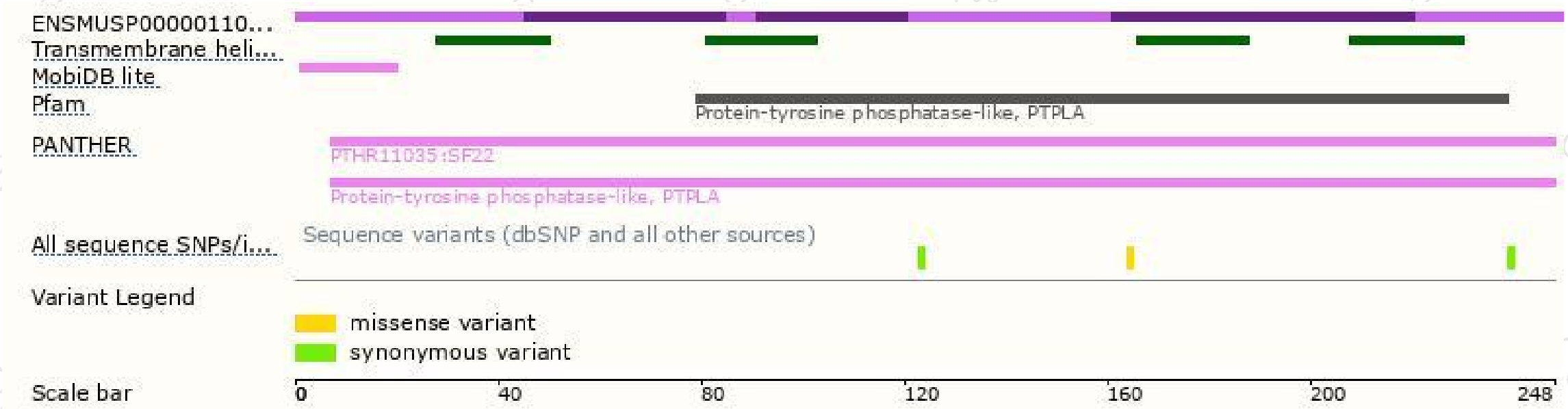
The strategy is based on the design of *Hacd1-203* transcript,The transcription is shown below



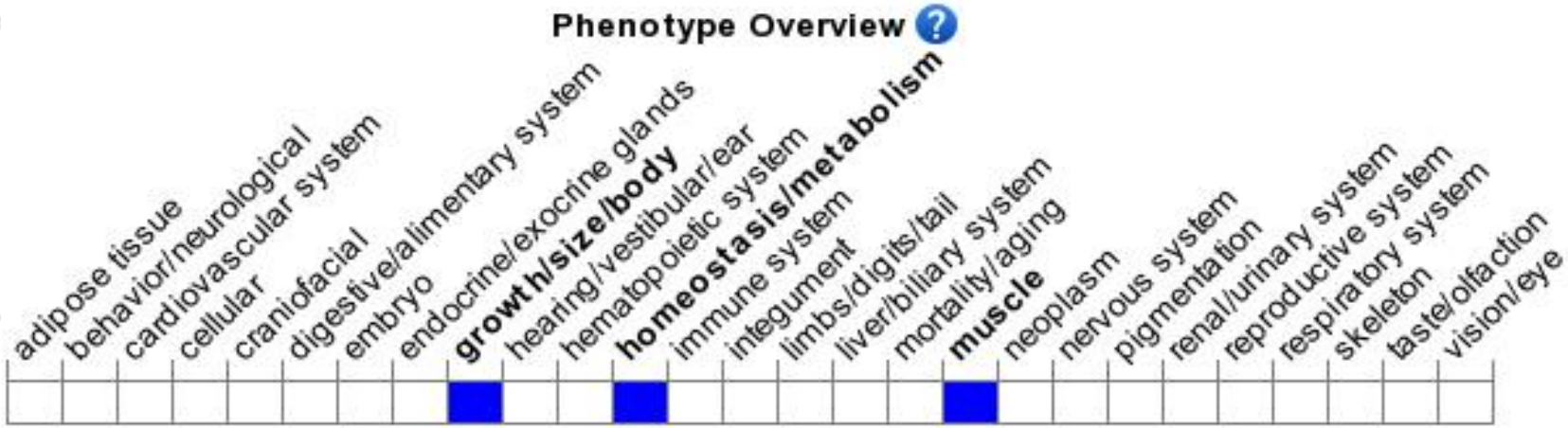
Genomic location distribution



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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