

***Idh2* Cas9-CKO Strategy**

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Project Overview

Project Name

Idh2

Project type

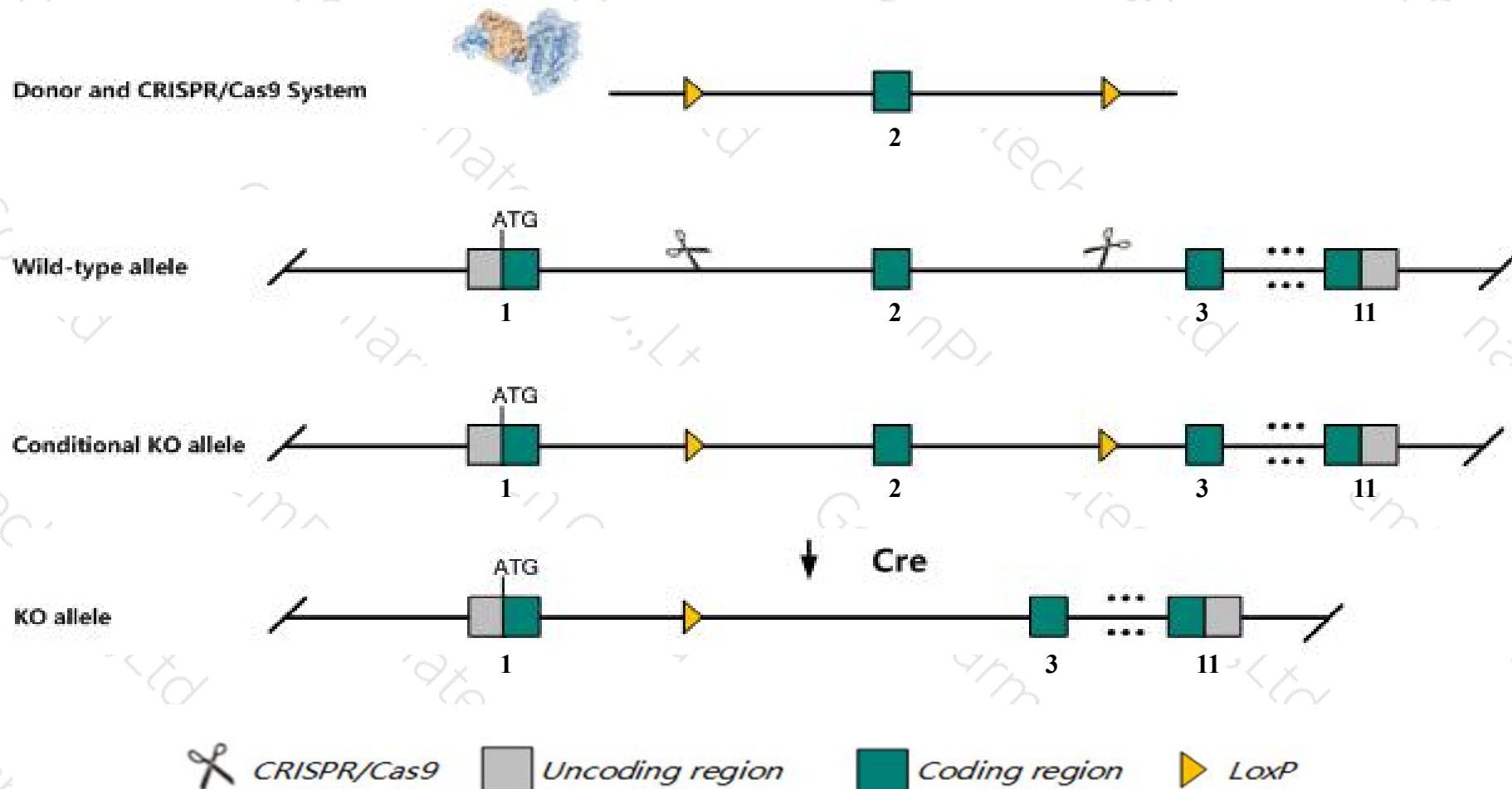
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Idh2* gene. The schematic diagram is as follows:



Technical routes

- The *Idh2* gene has 7 transcripts. According to the structure of *Idh2* gene, exon2 of *Idh2-201* (ENSMUST00000107384.9) transcript is recommended as the knockout region. The region contains 92bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Idh2* 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 knock-out allele exhibit suppression of tumorigenesis from B16F10 melanoma cells.
- The *Idh2* gene is located on the Chr7. 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)

Idh2 isocitrate dehydrogenase 2 (NADP+), mitochondrial [Mus musculus (house mouse)]

Gene ID: 269951, updated on 19-Mar-2019

Summary



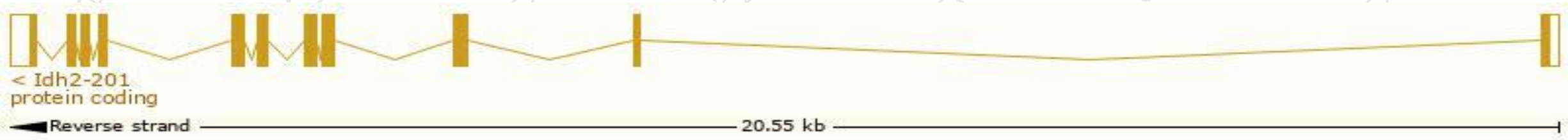
Official Symbol	Idh2 provided by MGI
Official Full Name	isocitrate dehydrogenase 2 (NADP+), mitochondrial provided by MGI
Primary source	MGI:MGI:96414
See related	Ensembl:ENSMUSG00000030541
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	E430004F23, IDPm, Idh-2
Expression	Broad expression in heart adult (RPKM 329.1), kidney adult (RPKM 134.6) and 22 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

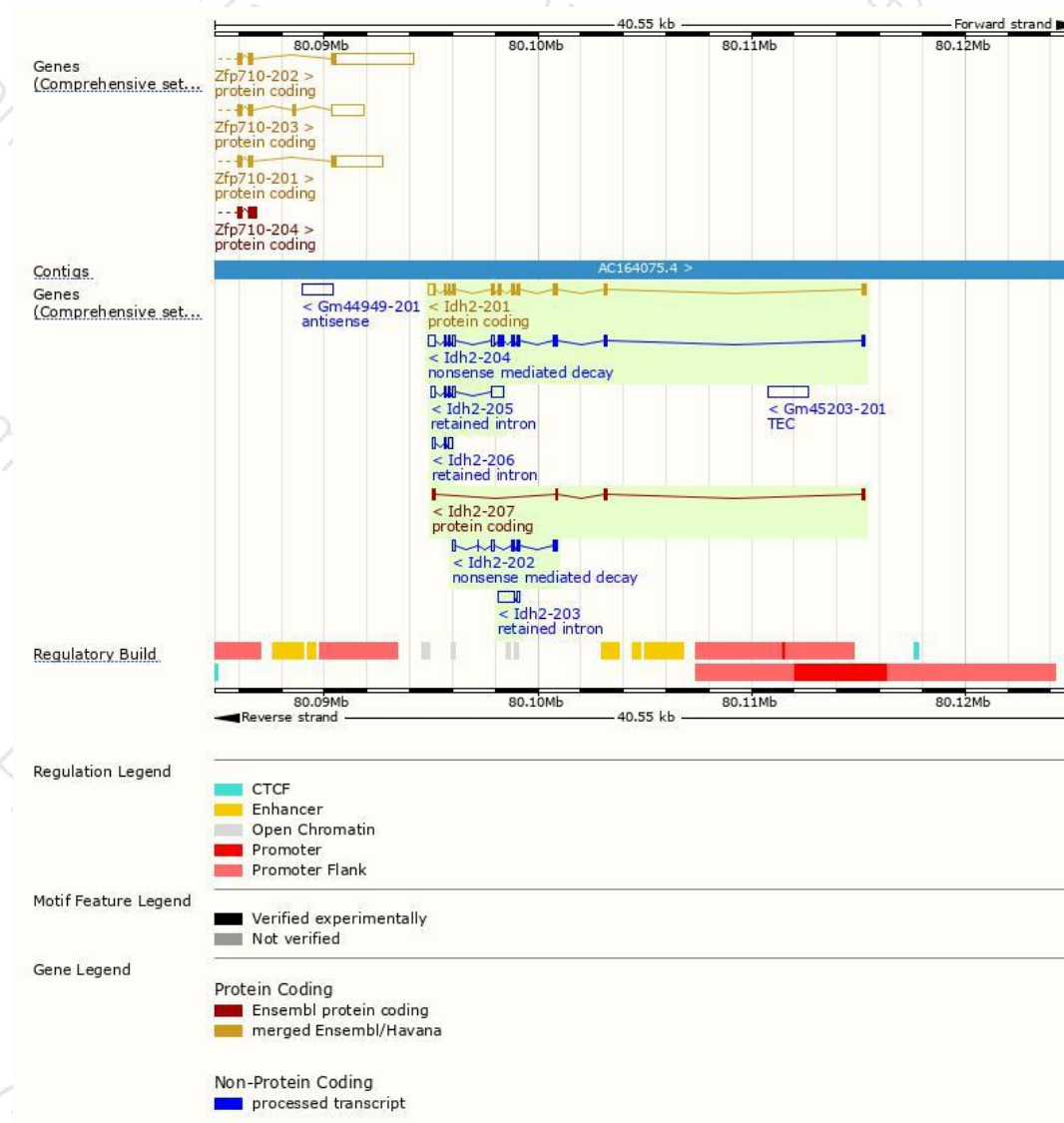
The gene has 7 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Idh2-201	ENSMUST00000107384.9	1745	452aa	Protein coding	CCDS39994	P54071	TSL:1 GENCODE basic APPRIS P1
Idh2-207	ENSMUST00000206714.1	392	90aa	Protein coding	-	A0A0U1RPR1	TSL:3 GENCODE basic
Idh2-204	ENSMUST00000134328.7	1790	294aa	Nonsense mediated decay	-	D6RIL6	TSL:1
Idh2-202	ENSMUST00000125542.2	743	150aa	Nonsense mediated decay	-	A0A0U1RP68	CDS 5' incomplete TSL:3
Idh2-205	ENSMUST00000139178.7	1085	No protein	Retained intron	-	-	TSL:2
Idh2-203	ENSMUST00000134070.1	891	No protein	Retained intron	-	-	TSL:1
Idh2-206	ENSMUST00000156761.1	485	No protein	Retained intron	-	-	TSL:2

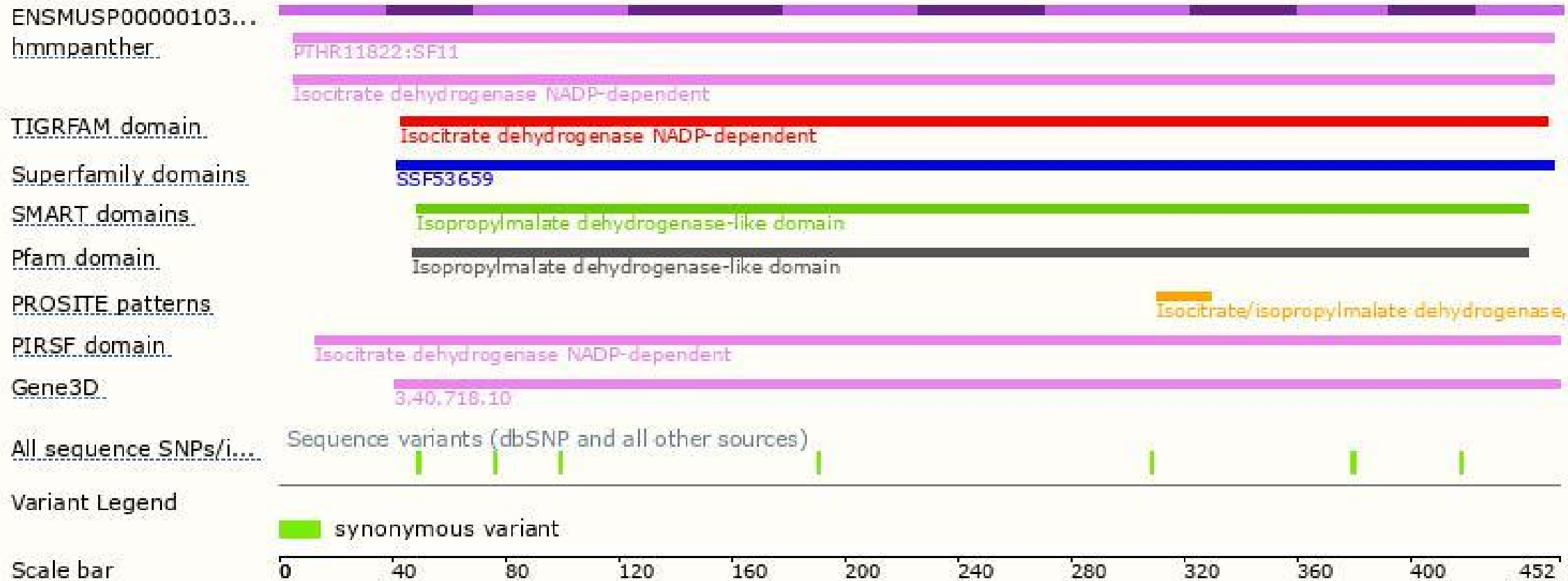
The strategy is based on the design of *Idh2-201* transcript,The transcription is shown below



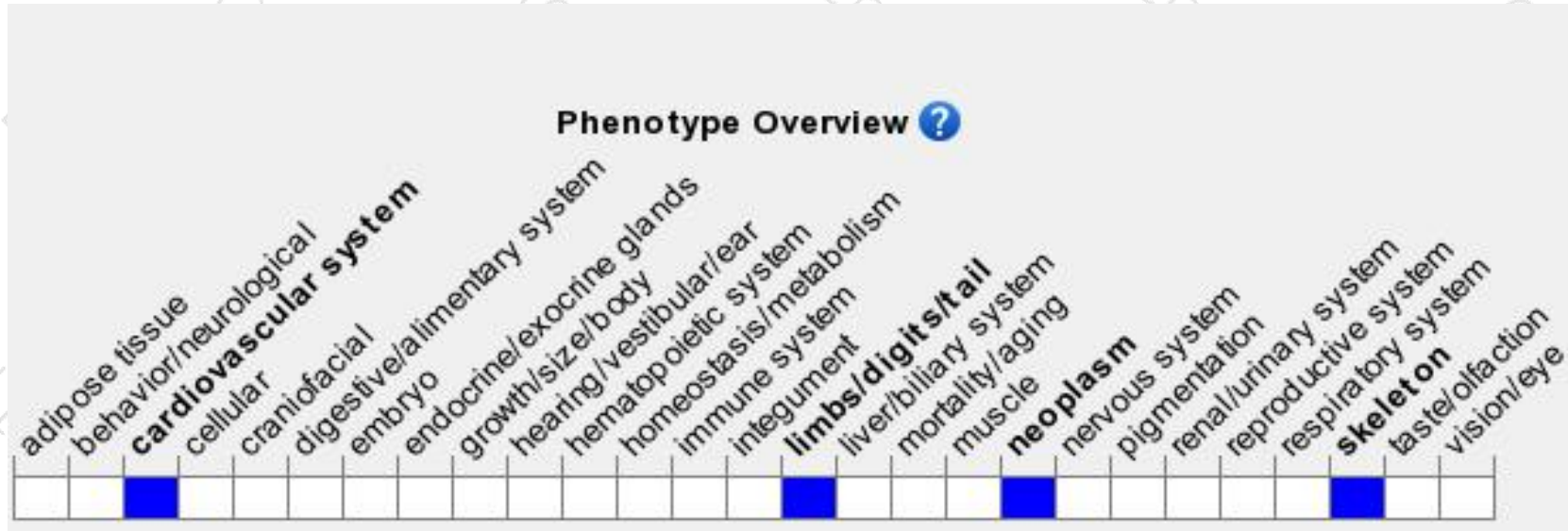
Genomic location distribution



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/>).

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

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