Akt2 Cas9-KO Strategy

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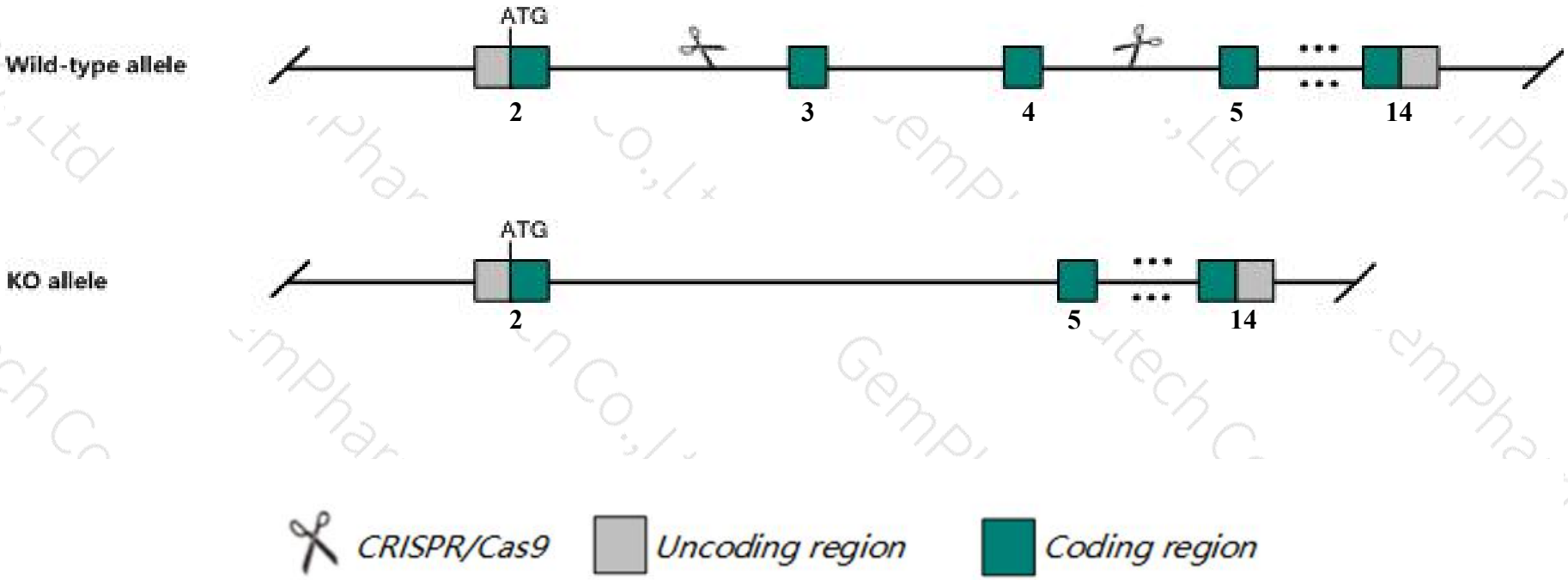
Design Date: 2019-7-25

Project Overview

Project Name	***Akt2***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Akt2* gene. The schematic diagram is as follows:



Technical routes

➢ The *Akt2* gene has 14 transcripts. According to the structure of *Akt2* gene, exon3-exon4 of *Akt2-205* (ENSMUST00000108344.8) transcript is recommended as the knockout region.The region contains 241bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Akt2* gene. The brief process is as follows: CRISPR/Cas9 system w

Notice

- According to the existing MGI data,Homozygotes for targeted null mutations exhibit insulin resistance and elevated plasma triglycerides. In males, the insulin resistance may progress to overt diabetes.

- The *Akt2* 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 the gene knockout on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

Gene information（NCBI）

集萃药康 GemPharmatech

Akt2 thymoma viral proto-oncogene 2 [Mus musculus (house mouse)]

Gene ID: 11652, updated on 9-Apr-2019

Summary

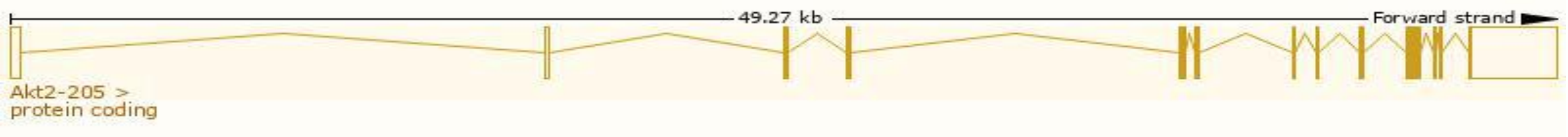
Official Symbol	Akt2 provided by MGI
Official Full Name	thymoma viral proto-oncogene 2 provided by MGI
Primary source	MGI:MGI:104874
See related	Ensembl:ENSMUSG00000004056
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	2410016A19Rik, AW554154, PKB, PKBbeta
Expression	Ubiquitous expression in subcutaneous fat pad adult (RPKM 40.3), mammary gland adult (RPKM 35.7) and 28 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

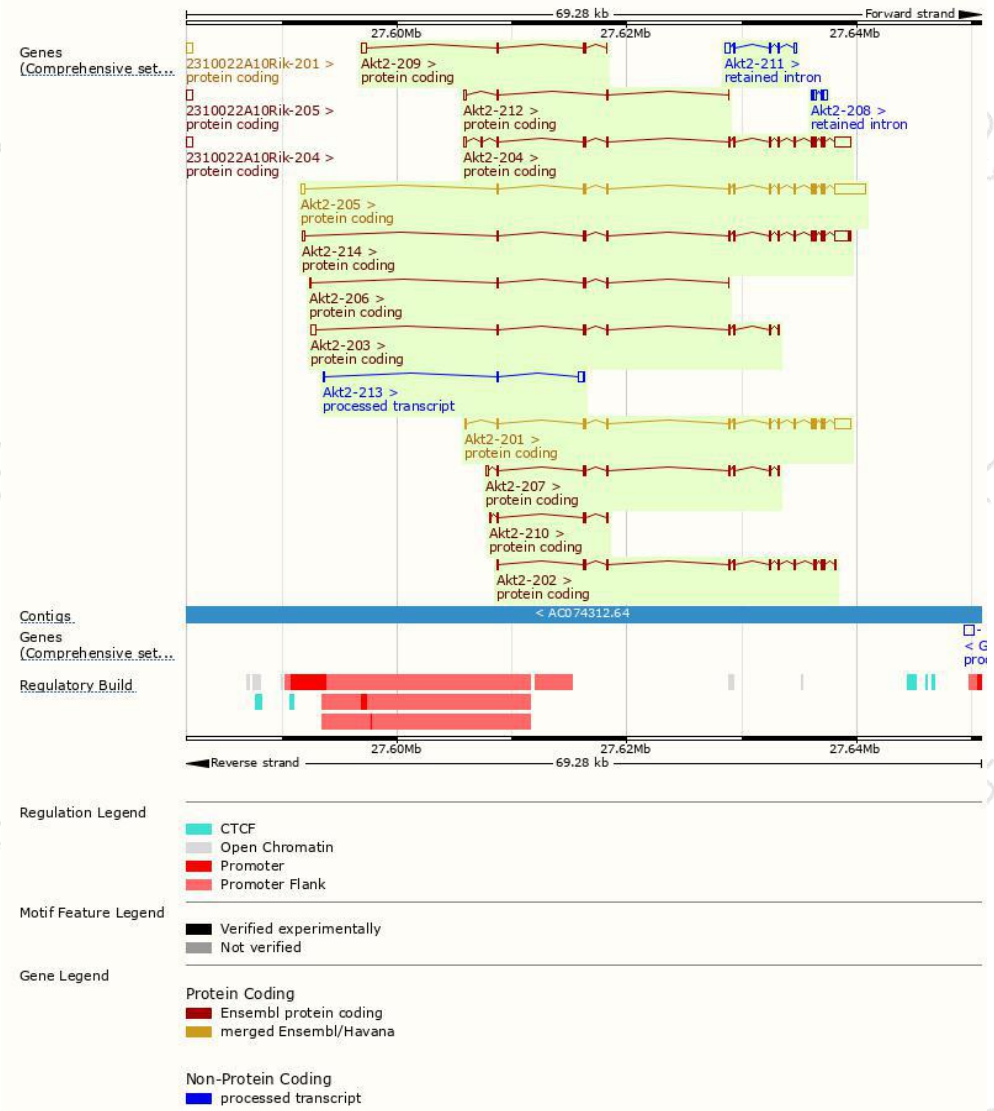
The gene has 14 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Akt2-205	ENSMUST00000108344.8	4544	481aa	Protein coding	CCDS21027	Q3TY95 Q60823	TSL:1 GENCODE basic APPRIS P1
Akt2-204	ENSMUST00000108343.7	3122	481aa	Protein coding	CCDS21027	Q3TY95 Q60823	TSL:5 GENCODE basic APPRIS P1
Akt2-201	ENSMUST00000051356.11	2923	481aa	Protein coding	CCDS21027	Q3TY95 Q60823	TSL:1 GENCODE basic APPRIS P1
Akt2-214	ENSMUST00000167435.7	2865	481aa	Protein coding	CCDS21027	Q3TY95 Q60823	TSL:1 GENCODE basic APPRIS P1
Akt2-202	ENSMUST00000085917.4	1392	438aa	Protein coding	-	F8WHG5	TSL:5 GENCODE basic
Akt2-203	ENSMUST00000108342.7	1125	222aa	Protein coding	-	D3YXM7	CDS 3' incomplete TSL:3
Akt2-207	ENSMUST00000136962.7	940	229aa	Protein coding	-	D3Z3N2	CDS 3' incomplete TSL:5
Akt2-209	ENSMUST00000138459.7	712	67aa	Protein coding	-	D3Z0M3	CDS 3' incomplete TSL:5
Akt2-206	ENSMUST00000128540.7	453	98aa	Protein coding	-	D3Z490	CDS 3' incomplete TSL:5
Akt2-210	ENSMUST00000142365.7	448	84aa	Protein coding	-	D3YZJ5	CDS 3' incomplete TSL:3
Akt2-212	ENSMUST00000143499.7	417	63aa	Protein coding	-	D3Z5X2	CDS 3' incomplete TSL:3
Akt2-213	ENSMUST00000147263.1	685	No protein	Processed transcript	-	-	TSL:3
Akt2-211	ENSMUST00000143347.1	983	No protein	Retained intron	-	-	TSL:3
Akt2-208	ENSMUST00000136981.1	770	No protein	Retained intron	-	-	TSL:2

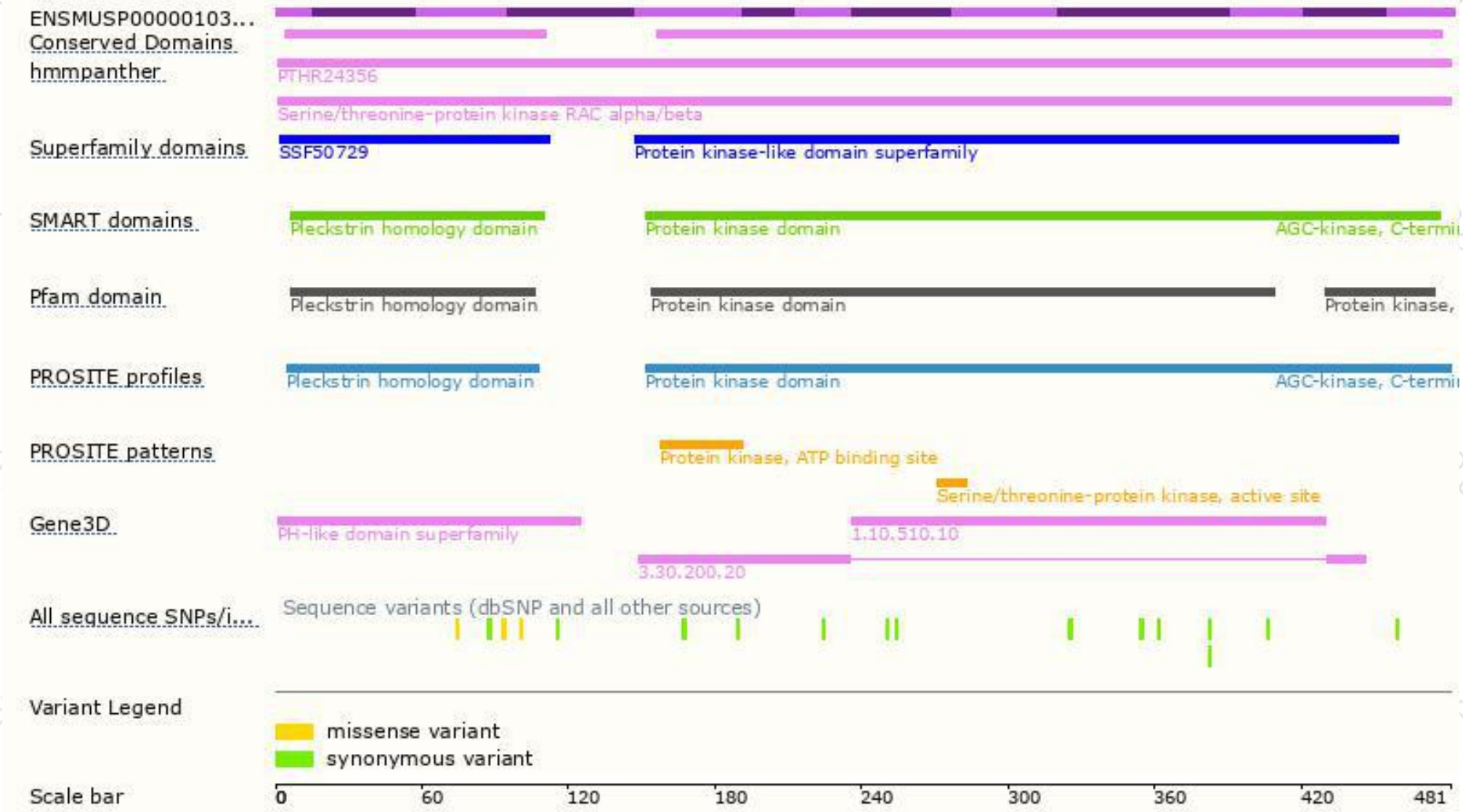
The strategy is based on the design of *Akt2-205* transcript,The transcription is shown below



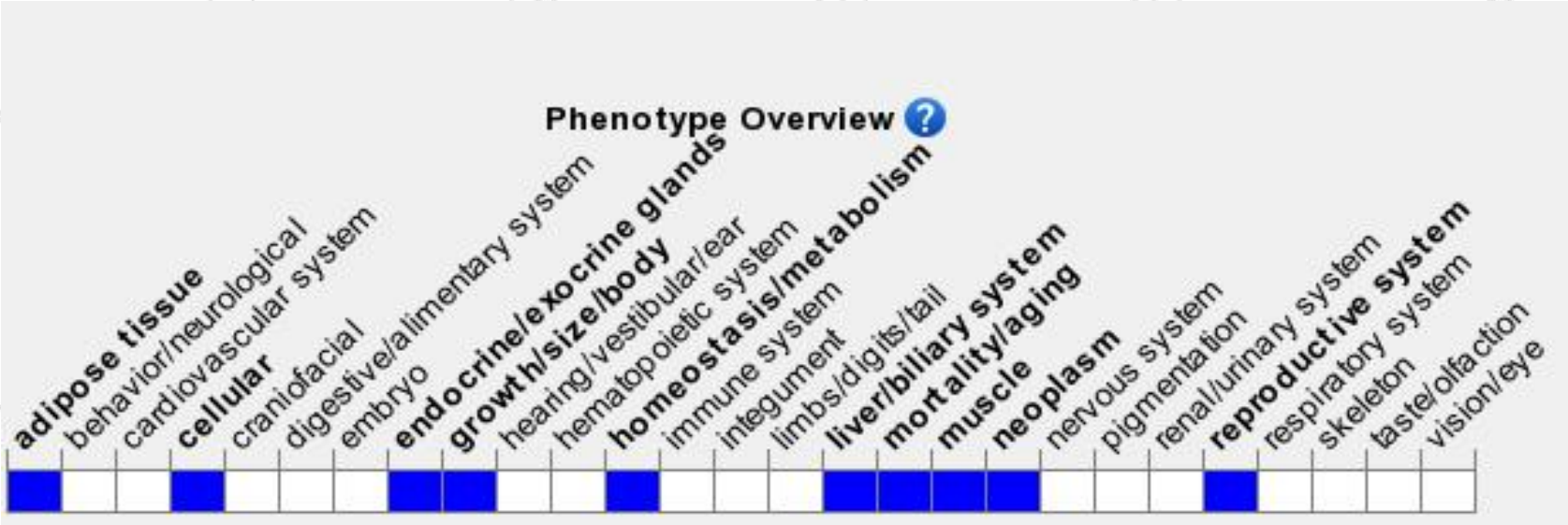
Genomic location distribution



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,Homozygotes for targeted null mutations exhibit insulin resistance and elevated plasma triglycerides. In males, the insulin resistance may progress to overt diabetes.

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

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