Gpr137 Cas9-CKO Strategy

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Project Overview

Project Name	***Gpr137***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Gpr137* gene. The schematic diagram is as follows:
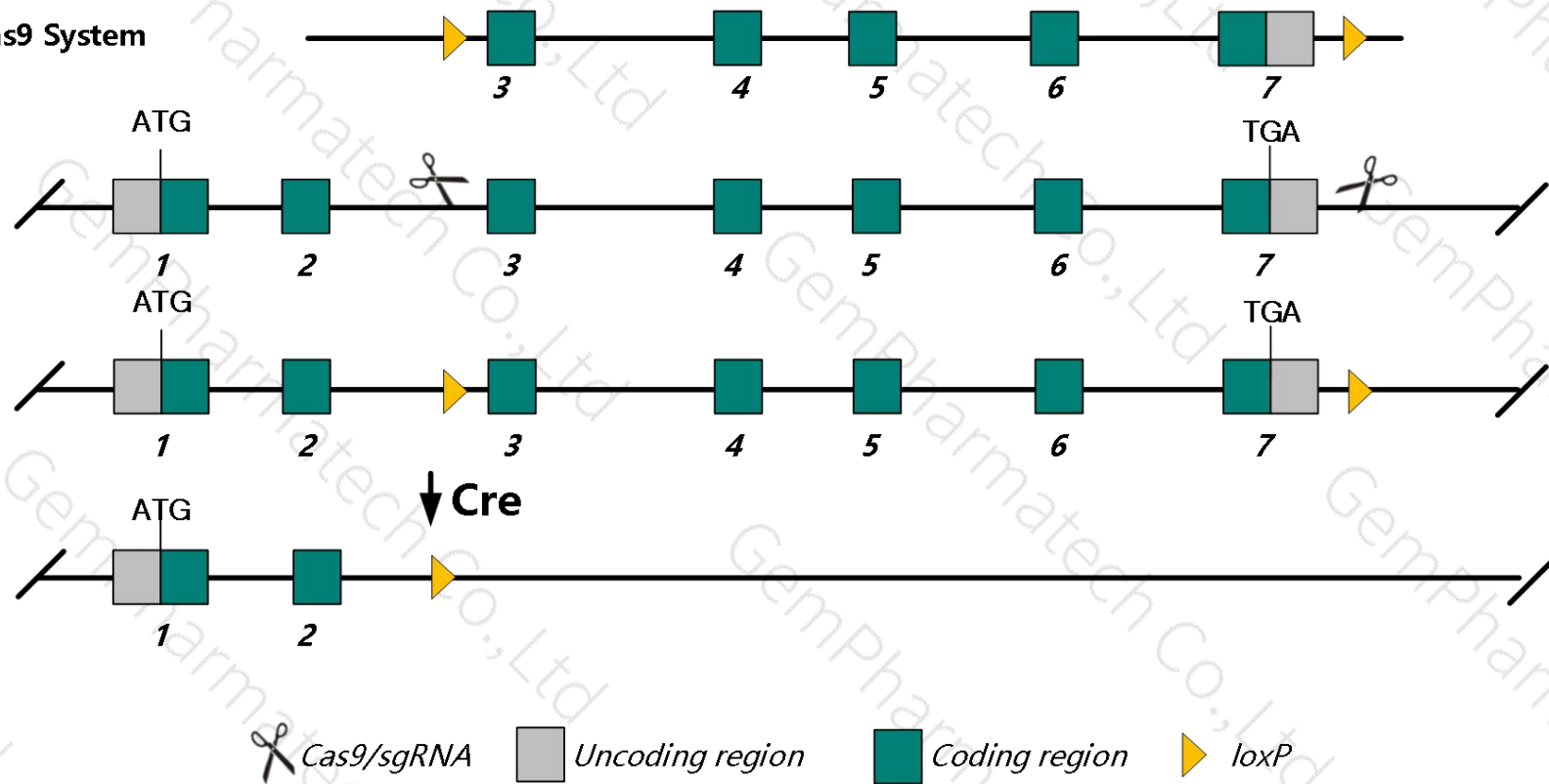
Technical routes

➢ The *Gpr137* gene has 4 transcripts. According to the structure of *Gpr137* gene, exon6-exon7 of *Gpr137-205* (ENSMUST00000166115.8) transcript is recommended as the knockout region. The region contains 784 bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Gpr137* gene. The brief process is as follows:gRNA was transcribed in vitro, donor was constructed.Cas9, gRNA 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

➢ The KO region is close to 5'UTR region of the *Bad* and *Kcnk4* gene.Knockout the region may affect the regulatory function of the *Bad* and *Kcnk4* gene.

➢ The size of intron 2 for 5'-loxP site insertion is 597 bp.

➢ The *Gpr137* gene is located on the Chr19. 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）

Gpr137　G protein-coupled receptor 137 [*Mus musculus* (house mouse)]

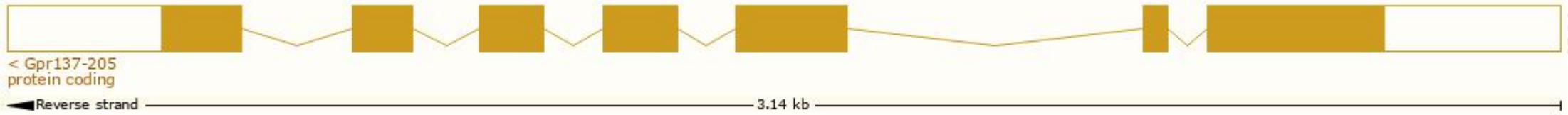Gene ID: 107173, updated on 12-Aug-2019

Summary

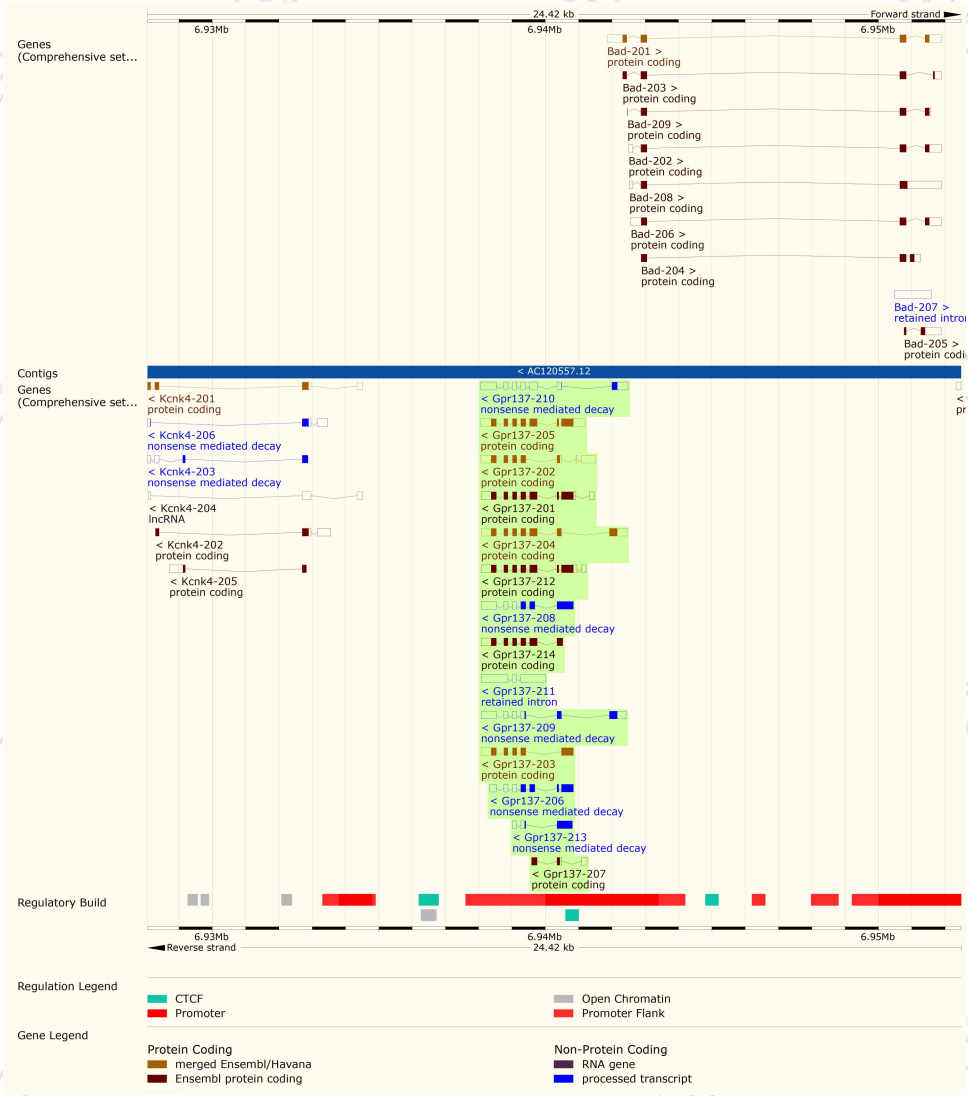|	
Official Symbol	Gpr137 provided by MGI
Official Full Name	G protein-coupled receptor 137 provided by MGI
Primary source	MGI:MGI:2147529
See related	Ensembl:ENSMUSG00000024958
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	AI428855
Expression	Ubiquitous expression in testis adult (RPKM 48.3), adrenal adult (RPKM 46.6) and 26 other tissues See more
Orthologs	human　all

Transcript information（Ensembl）

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

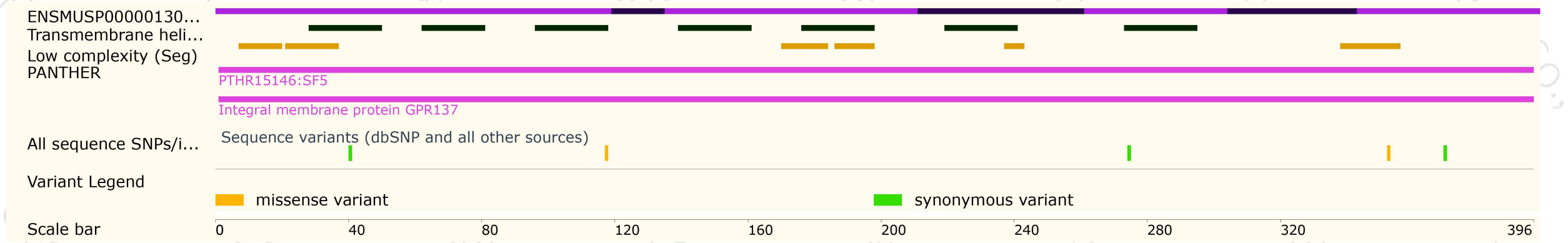| Name ▲	Transcript ID	bp	Protein	Translation ID	Biotype	CCDS	UniProt	Flags
Gpr137-201	ENSMUST00000025909.10	1717	396aa	ENSMUSP00000025909.4	Protein coding	CCDS29512	Q80ZU9	TSL:1 GENCODE basic APPRIS P1
Gpr137-202	ENSMUST00000099774.9	1434	214aa	ENSMUSP00000097362.3	Protein coding	CCDS50370	Q3TD99	TSL:1 GENCODE basic
Gpr137-203	ENSMUST00000099776.5	1213	304aa	ENSMUSP00000097364.4	Protein coding	CCDS50371	E9Q9I0	TSL:1 GENCODE basic
Gpr137-204	ENSMUST00000099782.9	1742	382aa	ENSMUSP00000097370.3	Protein coding	CCDS50372	Q3UPL3	TSL:1 GENCODE basic
Gpr137-205	ENSMUST00000166115.8	1858	396aa	ENSMUSP00000130969.1	Protein coding	CCDS29512	Q80ZU9	TSL:1 GENCODE basic APPRIS P1
Gpr137-206	ENSMUST00000235237.1	1161	236aa	ENSMUSP00000157604.1	Nonsense mediated decay	-	-	-
Gpr137-207	ENSMUST00000235363.1	463	85aa	ENSMUSP00000157846.1	Protein coding	-	-	CDS 3' incomplete
Gpr137-208	ENSMUST00000235518.1	1504	263aa	ENSMUSP00000157489.1	Nonsense mediated decay	-	-	
Gpr137-209	ENSMUST00000235881.1	1490	131aa	ENSMUSP00000157950.1	Nonsense mediated decay	-	-	
Gpr137-210	ENSMUST00000236348.1	1712	54aa	ENSMUSP00000157999.1	Nonsense mediated decay	-	-	
Gpr137-211	ENSMUST00000237911.1	1666	No protein	-	Retained intron	-	-	
Gpr137-212	ENSMUST00000237934.1	1729	396aa	ENSMUSP00000158264.1	Protein coding	CCDS29512	-	GENCODE basic APPRIS P1
Gpr137-213	ENSMUST00000238128.1	737	162aa	ENSMUSP00000158431.1	Nonsense mediated decay	-	-	CDS 5' incomplete
Gpr137-214	ENSMUST00000238183.1	1255	318aa	ENSMUSP00000158230.1	Protein coding	-	-	CDS 5' incomplete

The strategy is based on the design of *Gpr137-205* transcript,The transcription is shown below

< Gpr137-205
protein coding

◄ Reverse strand

3.14 kb

Genomic location distribution

Protein domain

ENSMUSP00000130...	
Transmembrane heli...	
Low complexity (Seg)	
PANTHER	PTHR15146:SF5
	Integral membrane protein GPR137
All sequence SNPs/i...	Sequence variants (dbSNP and all other sources)
Variant Legend	

■ missense variant　　　　　■ synonymous variant

| Scale bar | 0 | 40 | 80 | 120 | 160 | 200 | 240 | 280 | 320 | 396 |

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