Vps53 Cas9-KO *Strategy*

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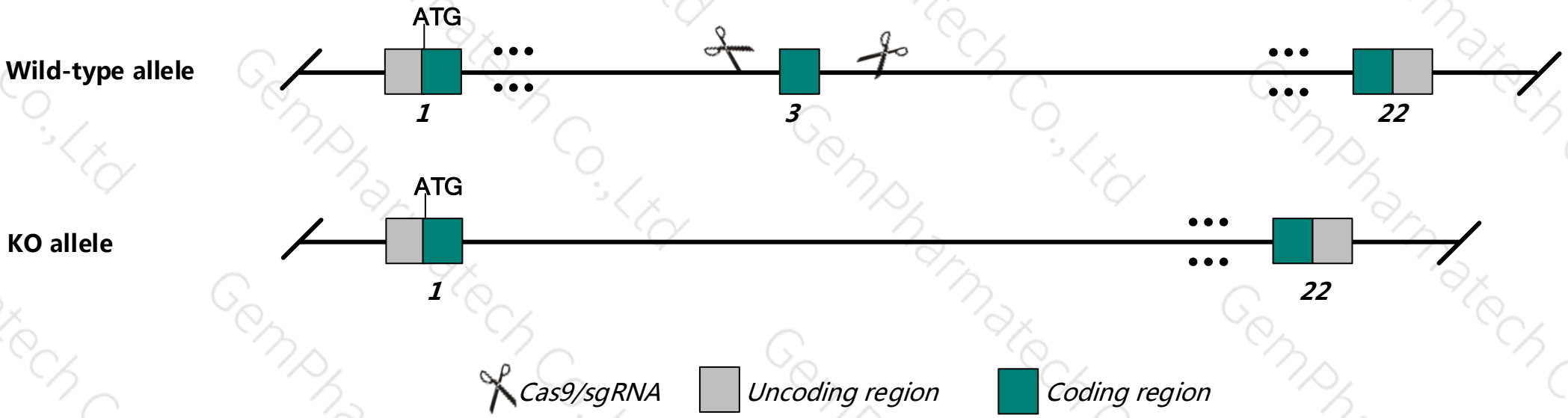
Project Overview

Project Name	***Vps53***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Vps53* gene. The schematic diagram is as follows:



Technical routes

- The *Vps53* gene has 16 transcripts.According to the structure of *Vps53* gene, exon3 of *Vps53*-201 (ENSMUST00000056601.10) transcript is recommended as the knockout region.The region contains 50bp coding sequence.Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Vps53* gene. The brief process is as follows: sgRNA was transcribed in vitro.Cas9, sgRNA 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.

Notice

- According to the existing MGI data，Mice homozygous for a knock-out allele exhibit embryonic lethality prior to E12.5 with trophoblast cell hyperplasia.
- Transcript *Vps53-204* and *Vps53-216* may not be affected.
- The *Vps53* gene is located on the Chr11. 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）

Vps53 VPS53 GARP complex subunit [*Mus musculus* (house mouse)]

Gene ID: 68299, updated on 5-Aug-2018

Summary

Official Symbol	Vps53 provided by MGI
Official Full Name	VPS53 GARP complex subunit provided by MGI
Primary source	MGI:MGI:1915549
See related	Ensembl:ENSMUSG00000017288 Vega:OTTMUSG00000006225
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	Hccs1; 2010002A08Rik; 2310040I21Rik; 3100002B05Rik
Expression	Ubiquitous expression in CNS E18 (RPKM 8.3), cerebellum adult (RPKM 8.2) and 28 other tissues See more
Orthologs	human all

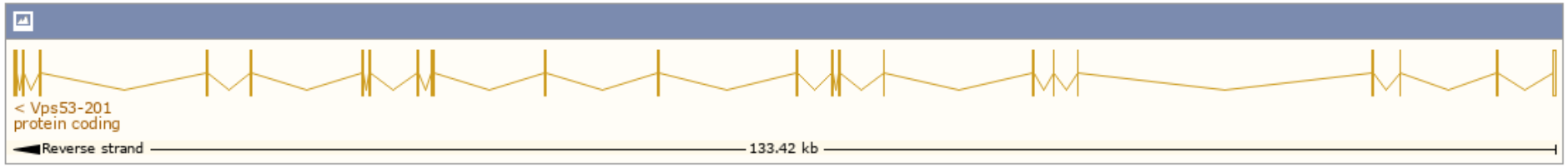
Transcript information（Ensembl）

The gene has 16 transcripts, and all transcripts are shown below:

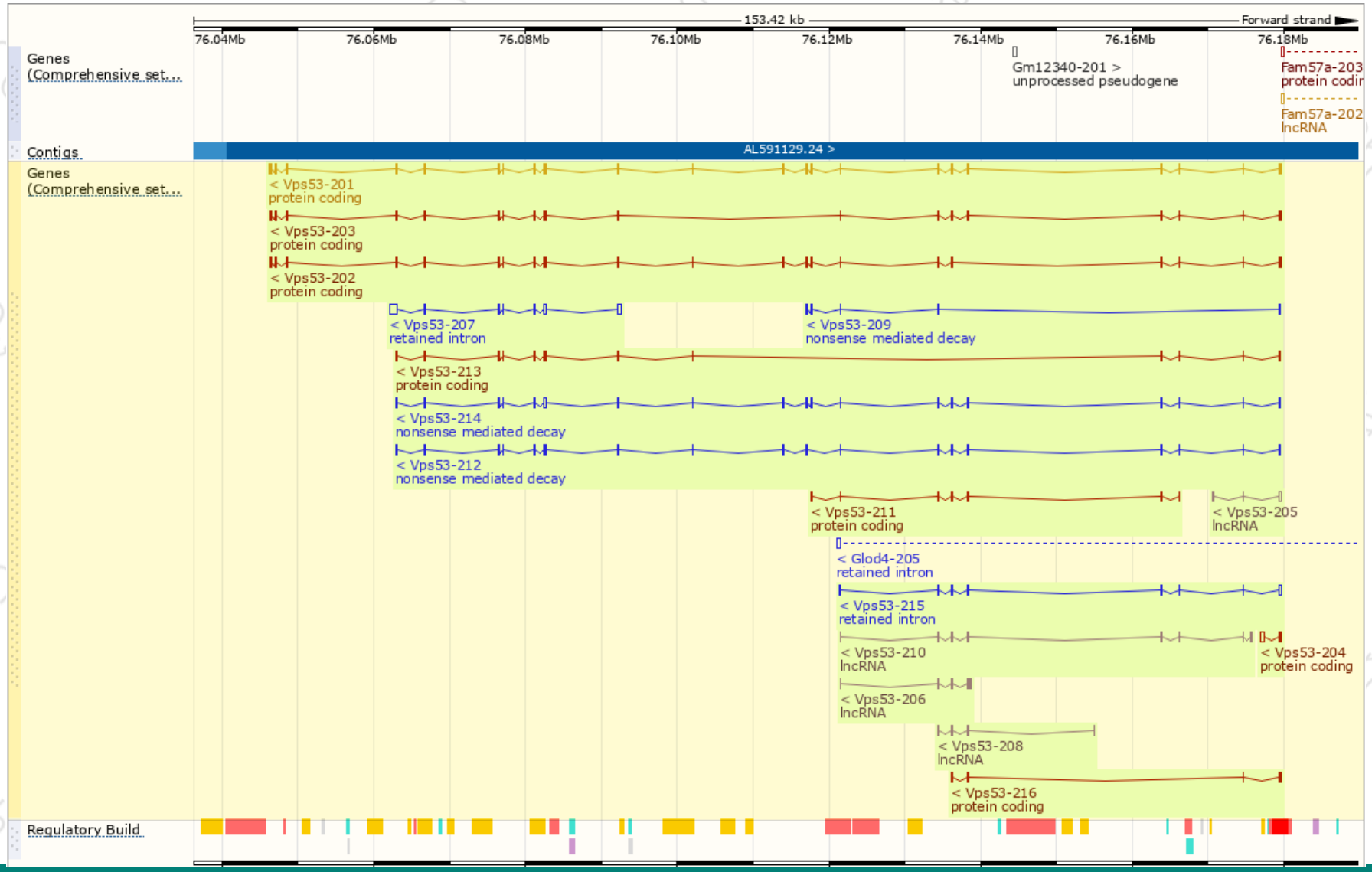
Show/hide columns (1 hidden) Filter

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Vps53-201	ENSMUST00000056601.10	2833	832aa	Protein coding	CCDS25060	Q8CCB4	TSL:1 GENCODE basic APPRIS P1
Vps53-202	ENSMUST00000094015.10	2645	803aa	Protein coding	-	E9PXG9	TSL:5 GENCODE basic
Vps53-203	ENSMUST00000108419.8	2209	655aa	Protein coding	-	Q8CCB4	TSL:1 GENCODE basic
Vps53-213	ENSMUST00000167114.7	1259	419aa	Protein coding	-	E9PWD1	CDS 3' incomplete TSL:5
Vps53-204	ENSMUST00000129256.1	650	36aa	Protein coding	-	E9Q124	TSL:1 GENCODE basic
Vps53-211	ENSMUST00000166436.7	610	204aa	Protein coding	-	F6Z4G7	CDS 5' and 3' incomplete TSL:5
Vps53-216	ENSMUST00000170730.2	506	123aa	Protein coding	-	E9Q3C3	CDS 3' incomplete TSL:5
Vps53-214	ENSMUST00000169734.7	2097	334aa	Nonsense mediated decay	-	E9Q648	TSL:5
Vps53-212	ENSMUST00000166752.7	1888	547aa	Nonsense mediated decay	-	E9PYD3	TSL:5
Vps53-209	ENSMUST00000163878.1	606	41aa	Nonsense mediated decay	-	E9Q8C4	TSL:5
Vps53-207	ENSMUST00000143163.7	2175	No protein	Retained intron	-	-	TSL:1
Vps53-215	ENSMUST00000170143.7	846	No protein	Retained intron	-	-	TSL:2
Vps53-210	ENSMUST00000166084.7	726	No protein	lncRNA	-	-	TSL:5
Vps53-206	ENSMUST00000141773.7	486	No protein	lncRNA	-	-	TSL:3
Vps53-205	ENSMUST00000140886.2	478	No protein	lncRNA	-	-	TSL:1
Vps53-208	ENSMUST00000143459.1	361	No protein	lncRNA	-	-	TSL:3

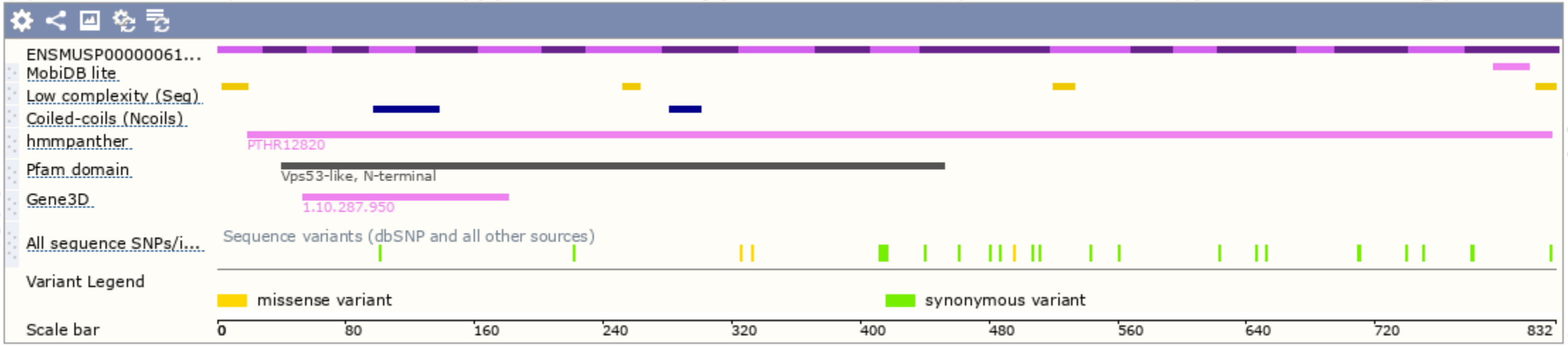
The strategy is based on the design of *Vps53*-201 transcript,The transcription is shown below



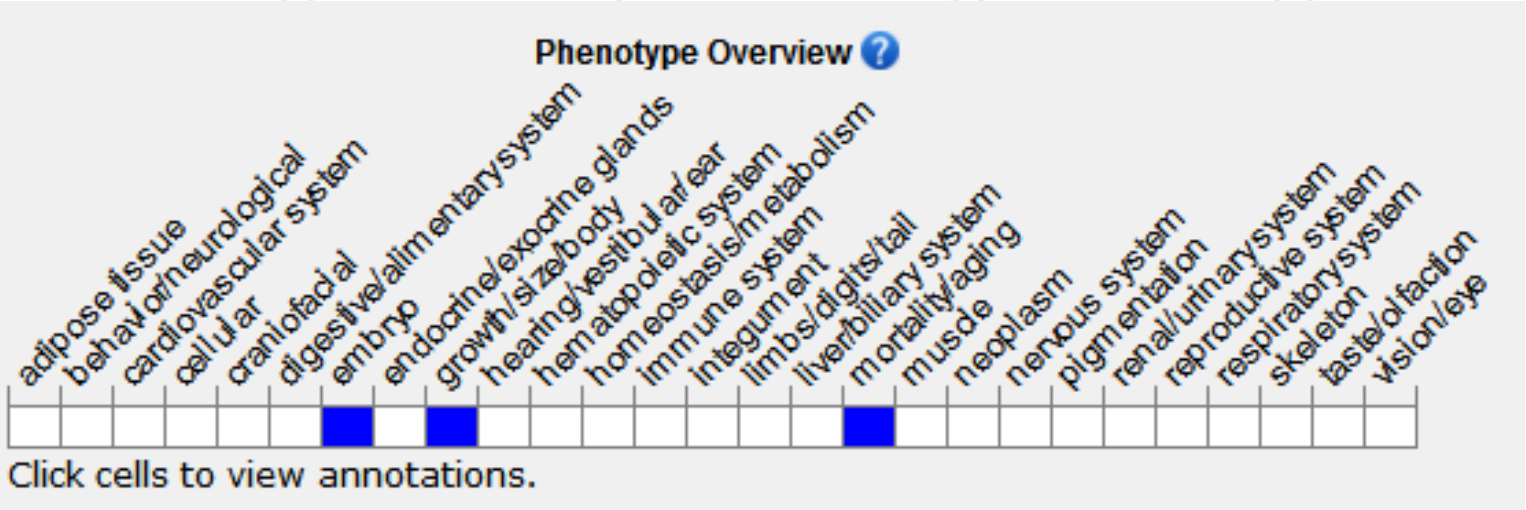
Genomic location distribution



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/) .

According to the existing MGI data,Mice homozygous for a knock-out allele exhibit embryonic lethality prior to E12.5 with trophoblast cell hyperplasia.

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

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