

Itgb4 Cas9-KO Strategy

Designer: Qiong Zhou

Project Overview



Project Name

Itgb4

Project type

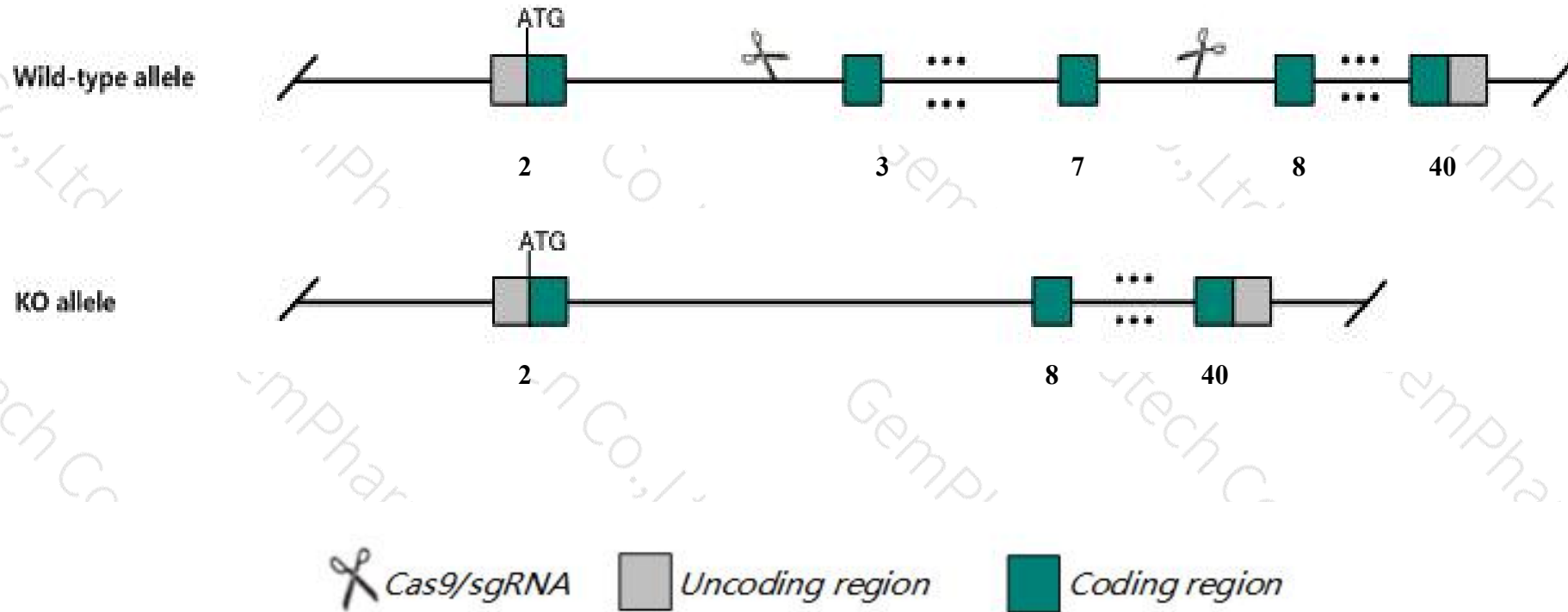
Cas9-KO

Strain background

C57BL/6J

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Itgb4* gene. The schematic diagram is as follows:



- The *Itgb4* gene has 10 transcripts. According to the structure of *Itgb4* gene, exon3-exon7 of *Itgb4-210* (ENSMUST00000169928.7) transcript is recommended as the knockout region. The region contains 659bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Itgb4* gene. The brief process is as follows: sgRNA was transcribed in vitro. Cas9 and sgRNA were microinjected into the fertilized eggs of C57BL/6J 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/6J mice.

- According to the existing MGI data, Homozygotes for targeted null mutations die shortly after birth with extensive detachment of the epidermis and other squamous epithelia. Stratified tissues lack hemidesmosomes and simple epithelia are also defective in adherence.
- The *Itgb4* 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)

Itgb4 integrin beta 4 [Mus musculus (house mouse)]

Gene ID: 192897, updated on 6-Apr-2019

Summary



Official Symbol	Itgb4 provided by MGI
Official Full Name	integrin beta 4 provided by MGI
Primary source	MGI:MGI:96613
See related	Ensembl:ENSMUSG00000020758
Gene type	protein coding
RefSeq status	REVIEWED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	AA407042, C230078O20, CD104
Summary	Integrins are heterodimers comprised of alpha and beta subunits, that are noncovalently associated transmembrane glycoprotein receptors. Different combinations of alpha and beta polypeptides form complexes that vary in their ligand-binding specificities. Integrins mediate cell-matrix or cell-cell adhesion, and transduced signals that regulate gene expression and cell growth. This gene encodes the integrin beta 4 subunit, a receptor for the laminins. This subunit tends to associate with alpha 6 subunit and is likely to play a pivotal role in the biology of invasive carcinoma. Multiple alternatively spliced transcript variants encoding distinct isoforms have been found for this gene. [provided by RefSeq, Jul 2008]
Expression	Biased expression in colon adult (RPKM 42.1), small intestine adult (RPKM 34.8) and 13 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

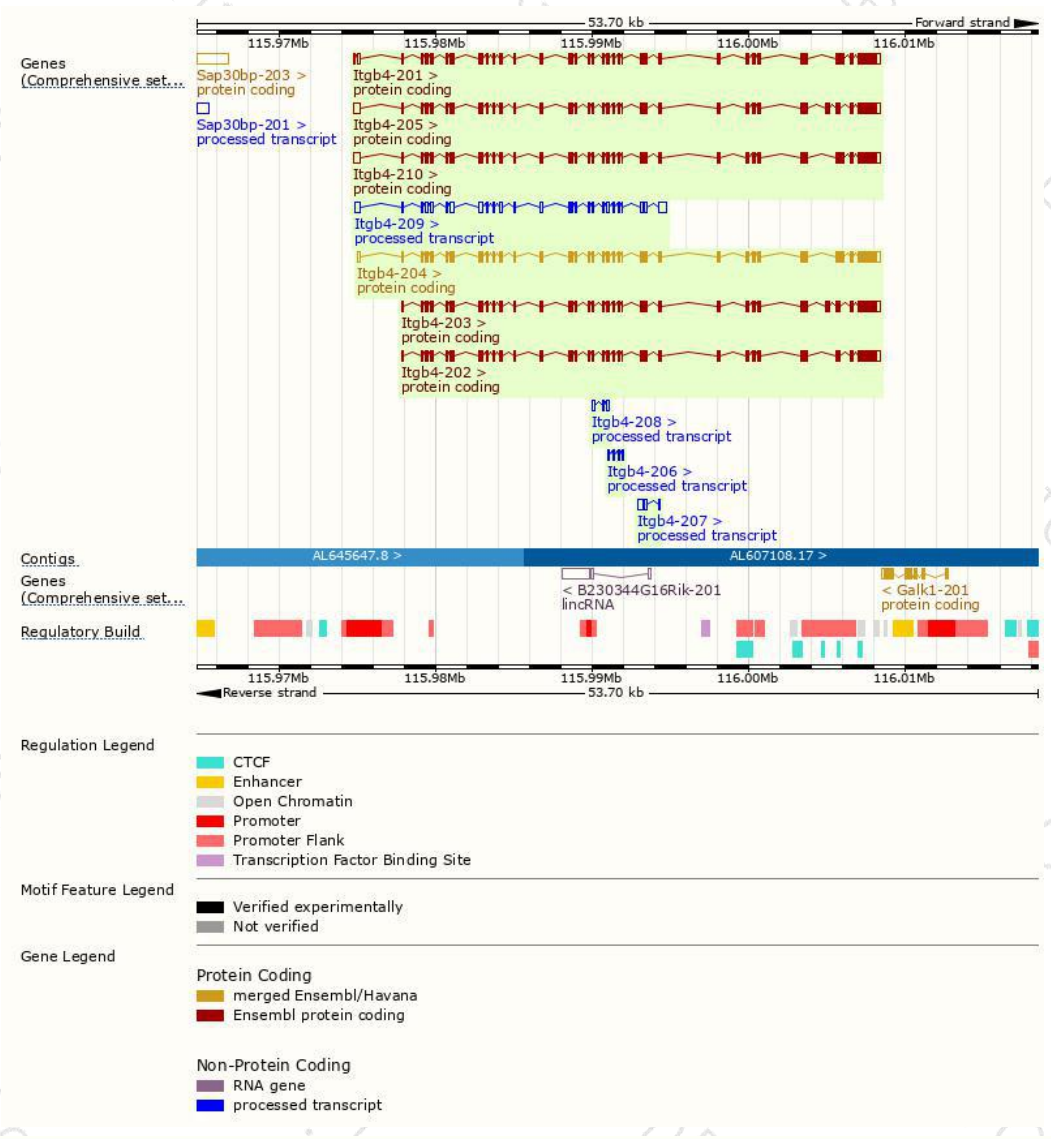
The gene has 10 transcripts, all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Itgb4-210	ENSMUST00000169928.7	6160	1802aa	Protein coding	CCDS36376	A2A864	TSL:5 GENCODE basic APPRIS P2
Itgb4-201	ENSMUST00000021107.13	6014	1802aa	Protein coding	CCDS36376	A2A864	TSL:5 GENCODE basic APPRIS P2
Itgb4-205	ENSMUST00000106461.7	6208	1818aa	Protein coding	-	A2A863	TSL:5 GENCODE basic APPRIS ALT 2
Itgb4-204	ENSMUST00000106460.8	5919	1806aa	Protein coding	-	A2A863	TSL:5 GENCODE basic APPRIS ALT 2
Itgb4-203	ENSMUST00000106458.1	5779	1818aa	Protein coding	-	A2A863	TSL:5 GENCODE basic APPRIS ALT 2
Itgb4-202	ENSMUST00000068981.12	5584	1753aa	Protein coding	-	A2A863	TSL:5 GENCODE basic APPRIS ALT 2
Itgb4-209	ENSMUST00000151691.7	3786	No protein	Processed transcript	-	-	TSL:5
Itgb4-207	ENSMUST00000130286.1	521	No protein	Processed transcript	-	-	TSL:3
Itgb4-208	ENSMUST00000150129.1	402	No protein	Processed transcript	-	-	TSL:2
Itgb4-206	ENSMUST00000127523.1	375	No protein	Processed transcript	-	-	TSL:2

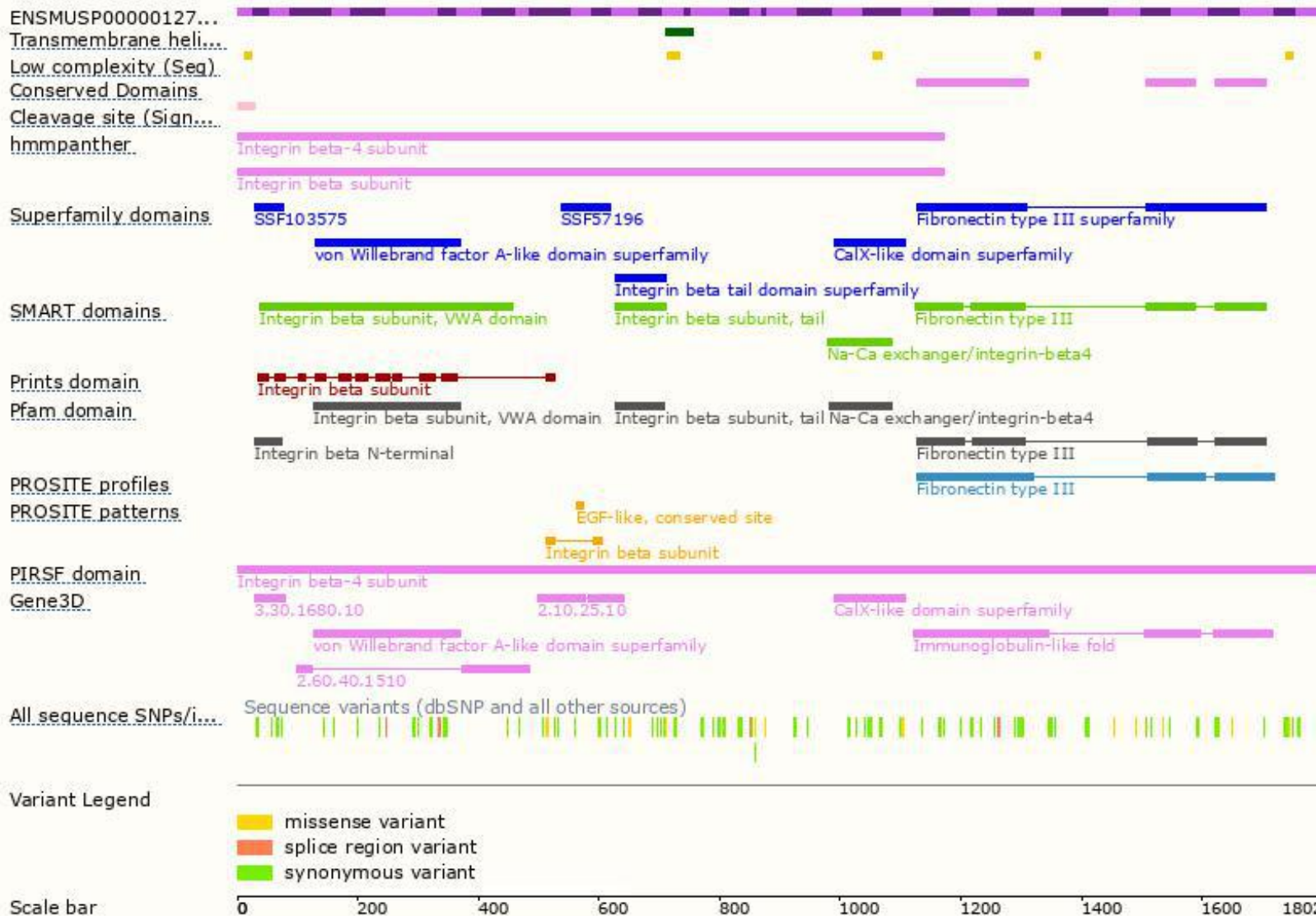
The strategy is based on the design of *Itgb4-210* transcript, The transcription is shown below



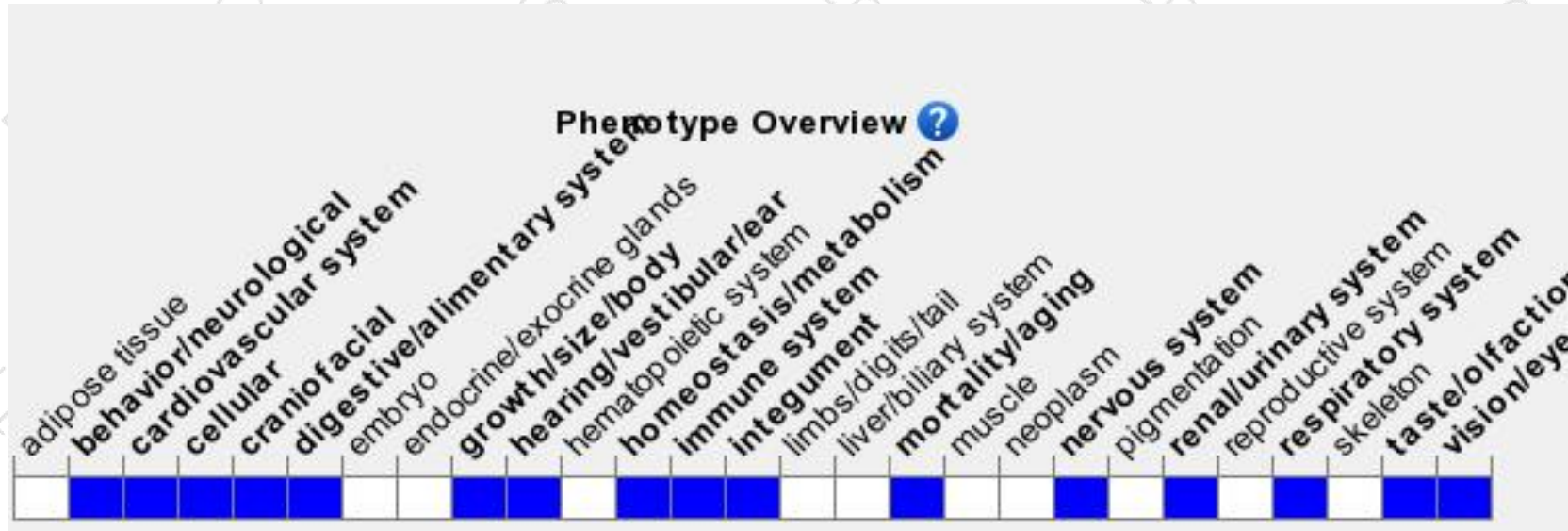
Genomic location distribution



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 die shortly after birth with extensive detachment of the epidermis and other squamous epithelia. Stratified tissues lack hemidesmosomes and simple epithelia are also defective in adherence.

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

Tel: 025-5864 1534

