Sh3bp2 Cas9-KO Strategy

Designer: Xueting Zhang

Reviewer: Daohua Xu

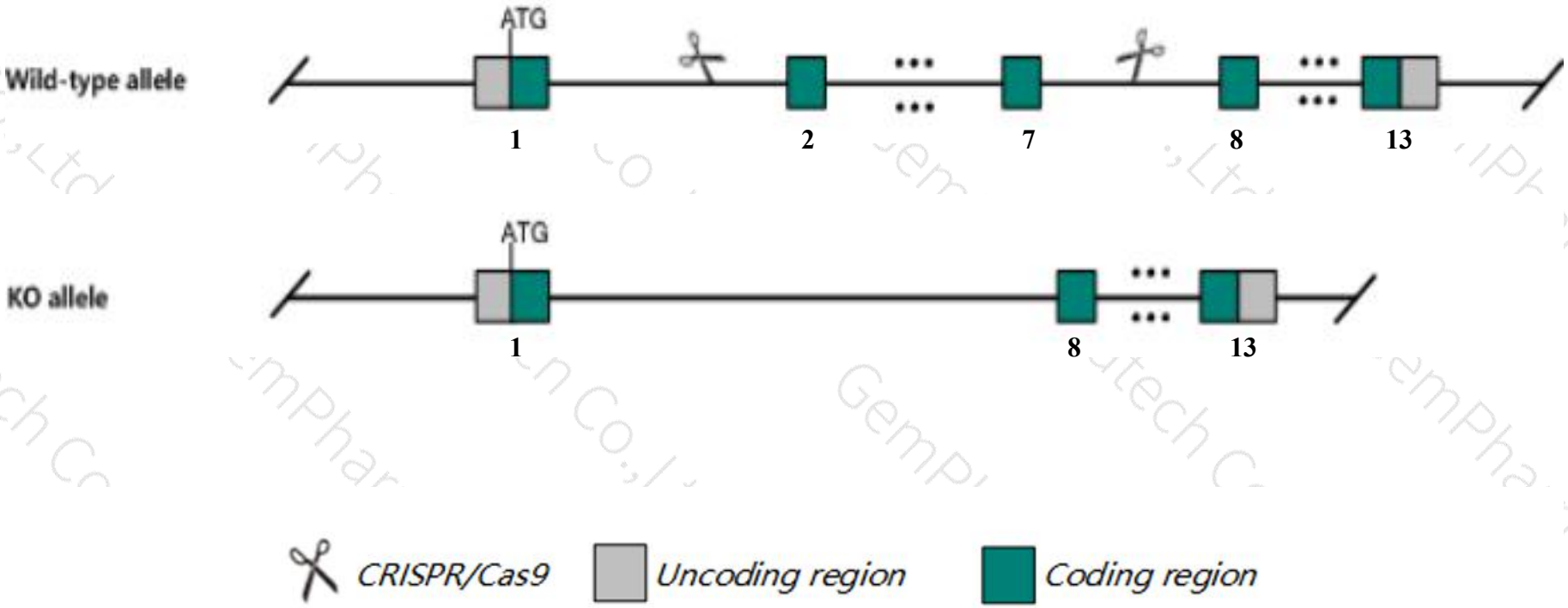
Design Date: 2020-7-21

Project Overview

Project Name	***Sh3bp2***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Sh3bp2* gene. The schematic diagram is as follows:



Technical routes

➢ The *Sh3bp2* gene has 8 transcripts. According to the structure of *Sh3bp2* gene, exon2-exon7 of *Sh3bp2-203*(ENSMUST00000118545.7) transcript is recommended as the knockout region.The region contains 590bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Sh3bp2* gene. The brief process is as follows: CRISPR/Cas9 system 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,nullizygous mutations may lead to higher pre-B cell numbers and impaired B cell receptor signaling or thymus-independent type 2 humoral responses. Homozygosity for a knock-in allele causes premature death, enhanced osteoclast differentiation and TNF production, systemic bone loss and inflammation.

➢ The *Sh3bp2* gene is located on the Chr5. 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）

Sh3bp2 SH3-domain binding protein 2 [Mus musculus (house mouse)]

Gene ID: 24055, updated on 13-Mar-2020

Summary

Official Symbol	Sh3bp2 provided by MGI
Official Full Name	SH3-domain binding protein 2 provided byMGI
Primary source	MGI:MGI:1346349
See related	Ensembl:ENSMUSG00000054520
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	3BP2
Expression	Ubiquitous expression in spleen adult (RPKM 19.5), CNS E14 (RPKM 11.0) and 25 other tissuesSee more
Orthologs	human all

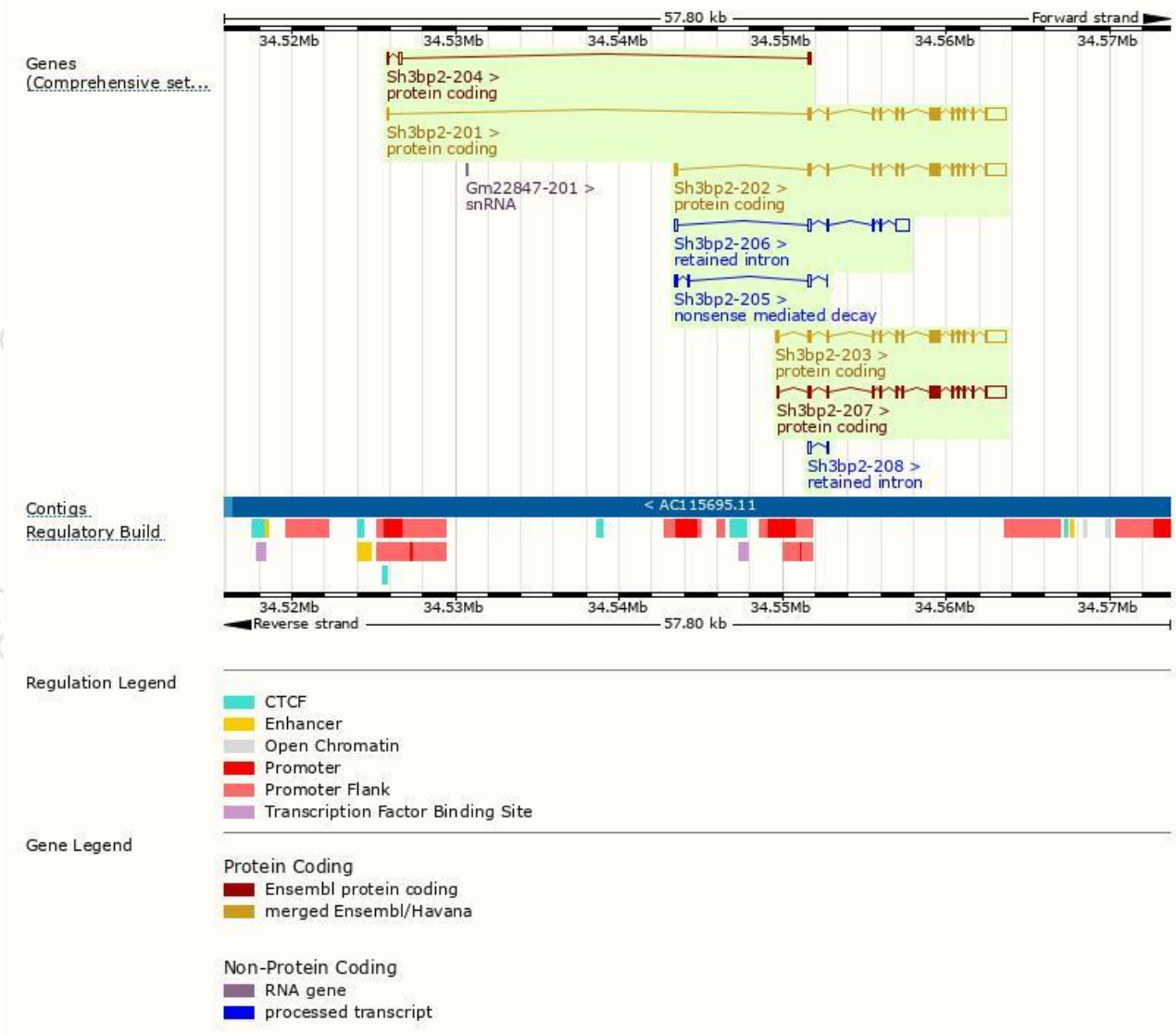
Transcript information（Ensembl）

The gene has 8 transcripts,all transcripts are shown below:

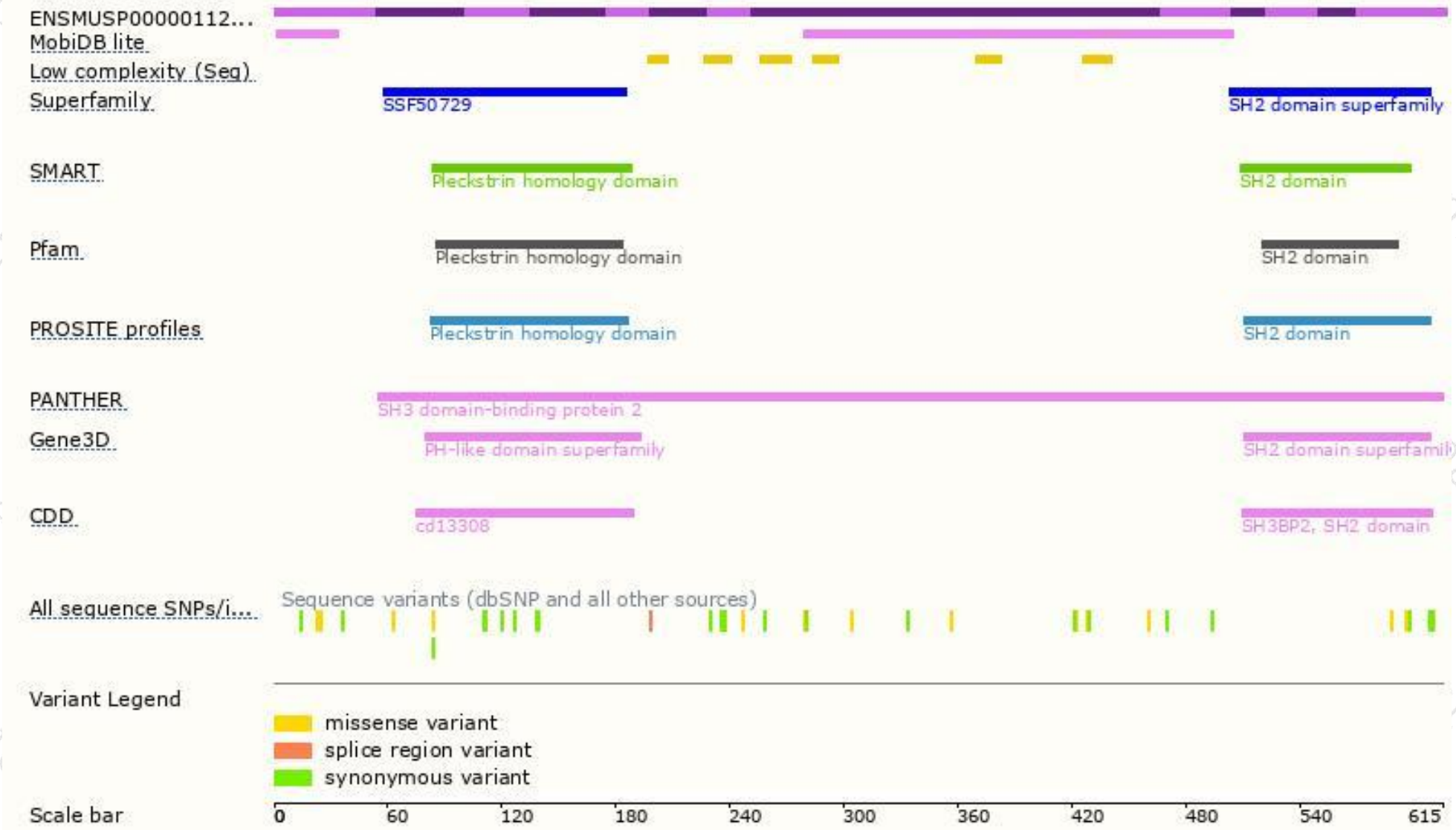
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Sh3bp2-203	ENSMUST00000118545.7	3034	615aa	Protein coding	CCDS51470	E9QJU7	TSL:1 GENCODE basic APPRIS ALT2
Sh3bp2-202	ENSMUST00000101316.9	3031	603aa	Protein coding	CCDS51469	Q3UD40	TSL:1 GENCODE basic APPRIS ALT2
Sh3bp2-207	ENSMUST00000179943.2	2935	559aa	Protein coding	CCDS19215	Q5U3L0	TSL:1 GENCODE basic APPRIS P3
Sh3bp2-201	ENSMUST00000067638.13	2885	559aa	Protein coding	CCDS19215	Q5U3L0	TSL:1 GENCODE basic APPRIS P3
Sh3bp2-204	ENSMUST00000125817.7	416	45aa	Protein coding	-	D3Z107	CDS 3' incomplete TSL:2
Sh3bp2-205	ENSMUST00000138912.7	431	46aa	Nonsense mediated decay	-	D6RDU0	TSL:5
Sh3bp2-206	ENSMUST00000153750.2	1481	No protein	Retained intron	-	-	TSL:1
Sh3bp2-208	ENSMUST00000202745.1	212	No protein	Retained intron	-	-	TSL:5

The strategy is based on the design of *Sh3bp2-203* transcript,the transcription is shown below:

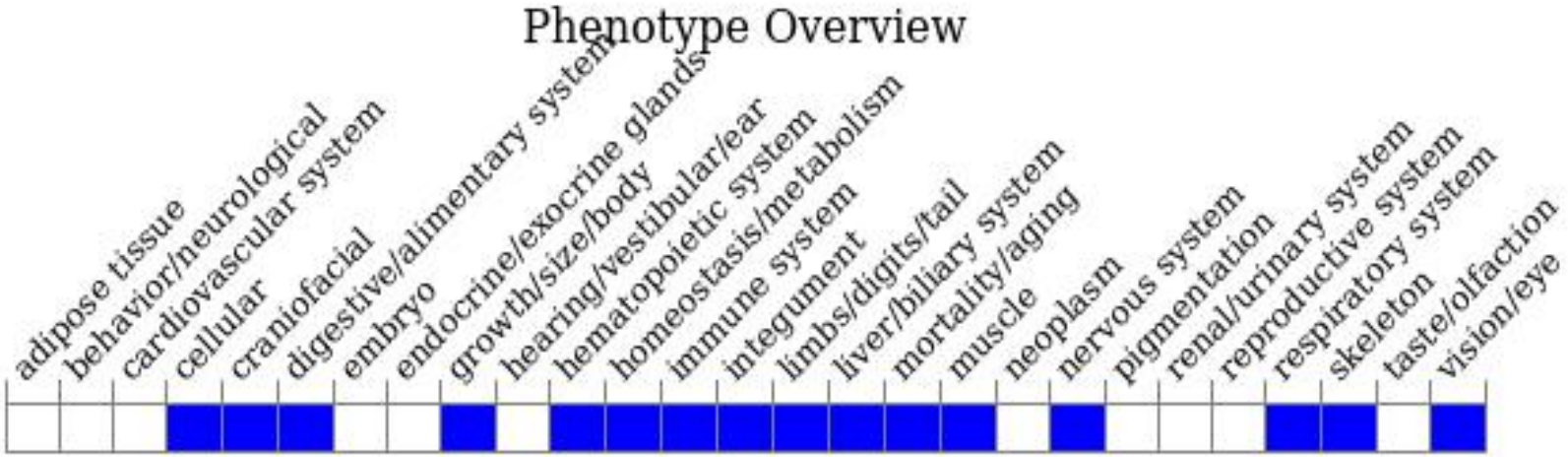
Genomic location distribution



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,nullizygous mutations may lead to higher pre-B cell numbers and impaired B cell receptor signaling or thymus-independent type 2 humoral responses. Homozygosity for a knock-in allele causes premature death, enhanced osteoclast differentiation and TNF production, systemic bone loss and inflammation.

集萃药康
GemPharmatech

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

Tel: 400-9660890

集萃药康生物科技
GemPharmatech Co.,Ltd