Shank3 Cas9-KO Strategy

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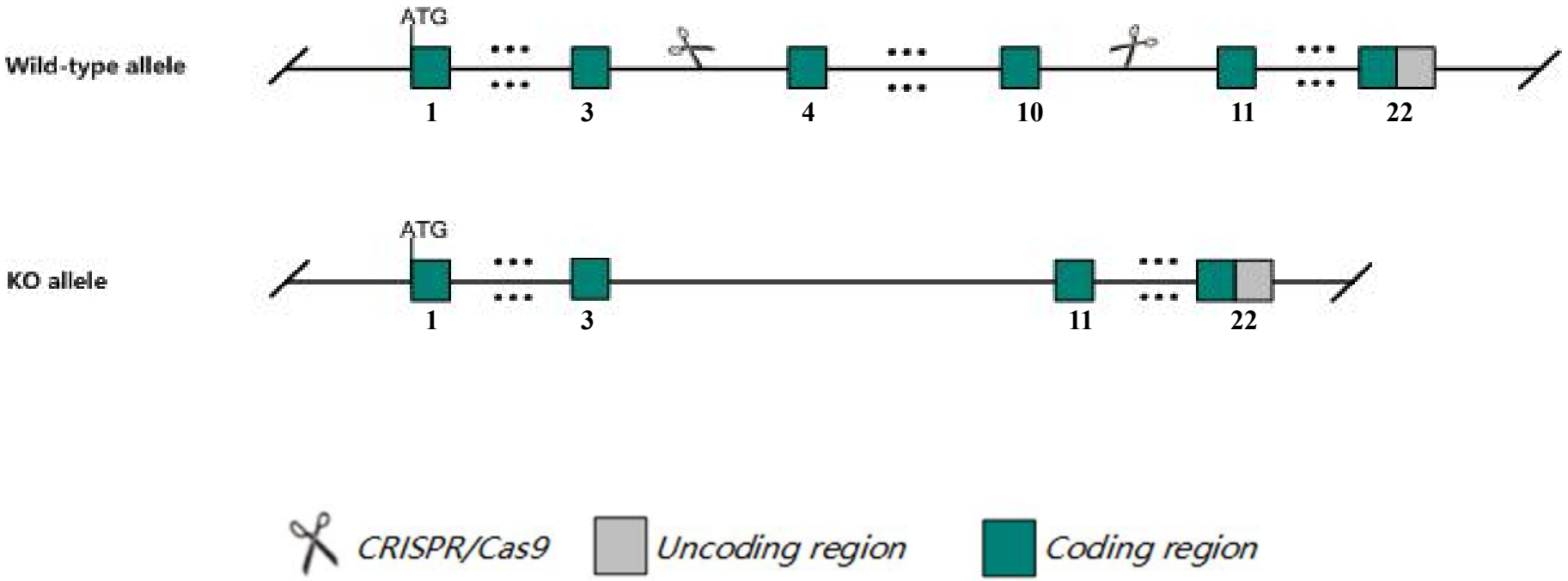
Project Overview

Project Name	***Shank3***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Shank3* gene. The schematic diagram is as follows:



Technical routes

The *Shank3* gene has 9 transcripts. According to the structure of *Shank3* gene, exon4-exon10 of *Shank3-201* (ENSMUST00000039074.12) transcript is recommended as the knockout region.The region contains 962bp coding sequence. Knock out the region will result in disruption of protein function.

In this project we use CRISPR/Cas9 technology to modify *Shank3* gene. The brief process is as follows: CRISPR/Cas9 syster

Notice

According to the existing MGI data,Mice carrying various deletions of exons encoding the ankyrin repeats (exons 4-9) exhibit a range of synaptic and autism-related impairments. Homozygotes lacking exon 9 show altered excitation/inhibition balance, increased rearing, and mildly impaired spatial memory.

The *Shank3* gene is located on the Chr15. 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

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Shank3 SH3 and multiple ankyrin repeat domains 3 [Mus musculus (house mouse)]

Gene ID: 58234, updated on 9-Apr-2019

Summary

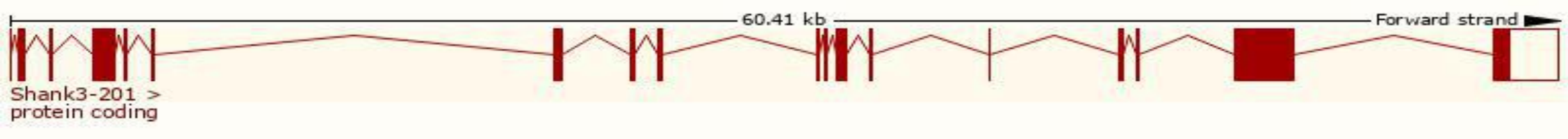
Official Symbol	Shank3 provided by MGI
Official Full Name	SH3 and multiple ankyrin repeat domains 3 provided by MGI
Primary source	MGI:MGI:1930016
See related	Ensembl:ENSMUSG00000022623
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	AI841104, SHANK3c-3, SHANK3c-4, Shank3b
Expression	Broad expression in lung adult (RPKM 45.6), adrenal adult (RPKM 22.3) and 20 other tissues See more
Orthologs	human all

Transcript information Ensembl

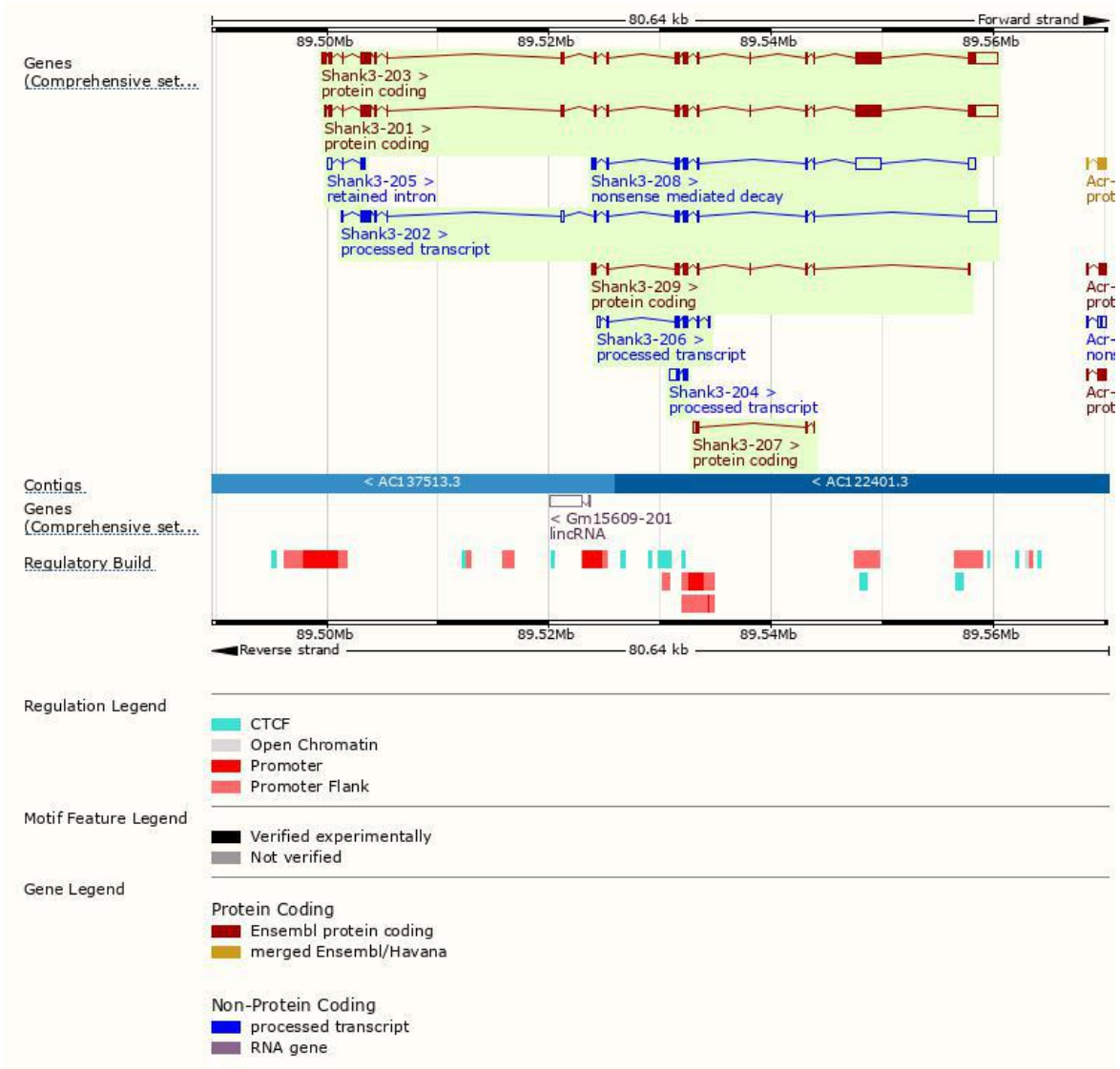
The gene has 9 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Shank3-201	ENSMUST00000039074.12	7131	1730aa	Protein coding	CCDS27754	Q4ACU6	TSL:1 GENCODE basic APPRIS P2
Shank3-203	ENSMUST00000109309.7	7365	1805aa	Protein coding	-	A0A0A0MQD5	TSL:1 GENCODE basic APPRIS ALT2
Shank3-209	ENSMUST00000230807.1	1337	382aa	Protein coding	-	Q4ACU6	GENCODE basic
Shank3-207	ENSMUST00000167173.1	719	135aa	Protein coding	-	E9Q1P5	CDS 3' incomplete TSL:5
Shank3-208	ENSMUST00000229559.1	4161	307aa	Nonsense mediated decay	-	A0A2R8VH81	
Shank3-202	ENSMUST00000066545.13	4702	No protein	Processed transcript	-	-	TSL:1
Shank3-204	ENSMUST00000123799.1	911	No protein	Processed transcript	-	-	TSL:5
Shank3-206	ENSMUST00000154240.7	899	No protein	Processed transcript	-	-	TSL:5
Shank3-205	ENSMUST00000135214.1	596	No protein	Retained intron	-	-	TSL:3

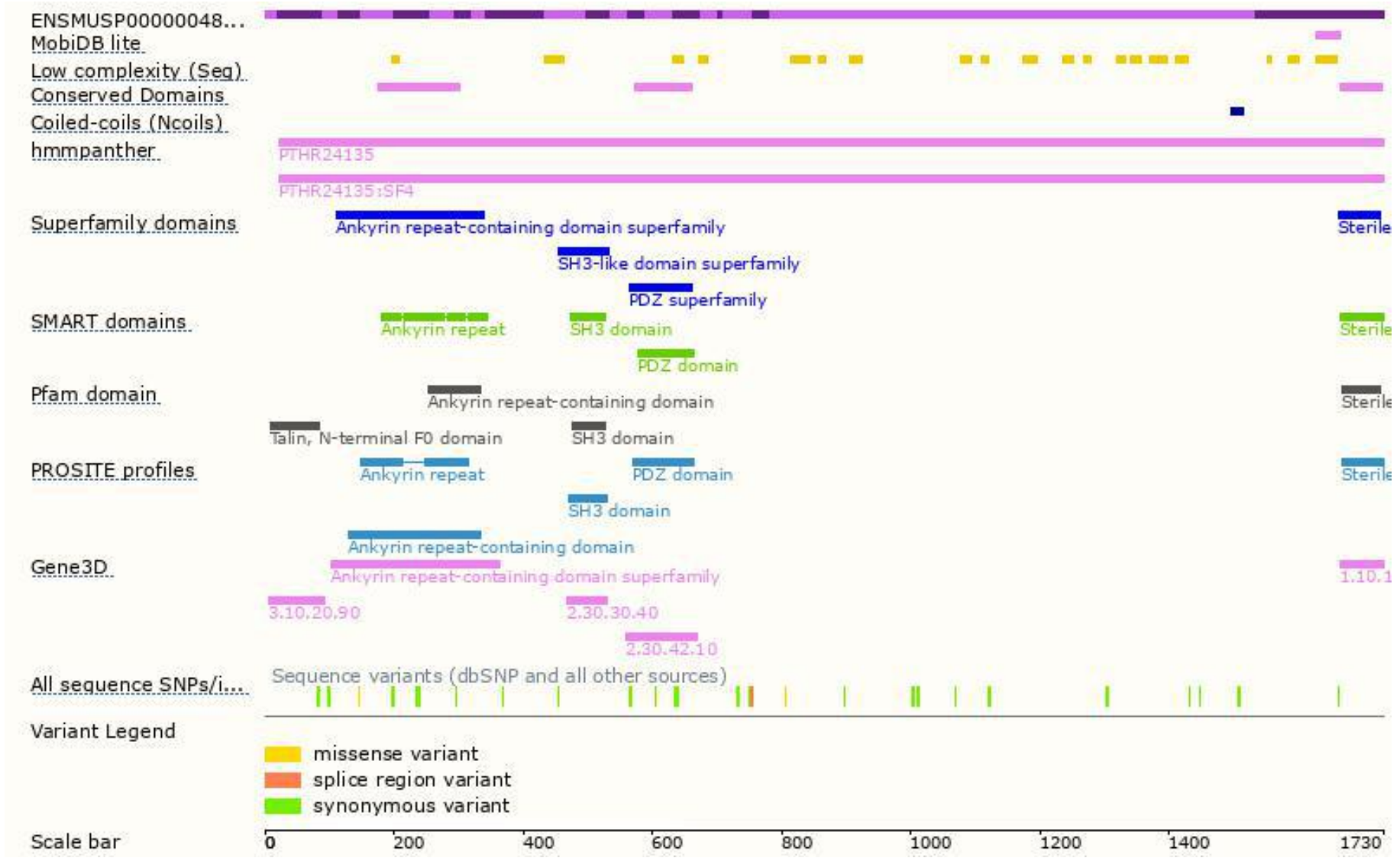
The strategy is based on the design of *Shank3-201* transcript,The transcription is shown below



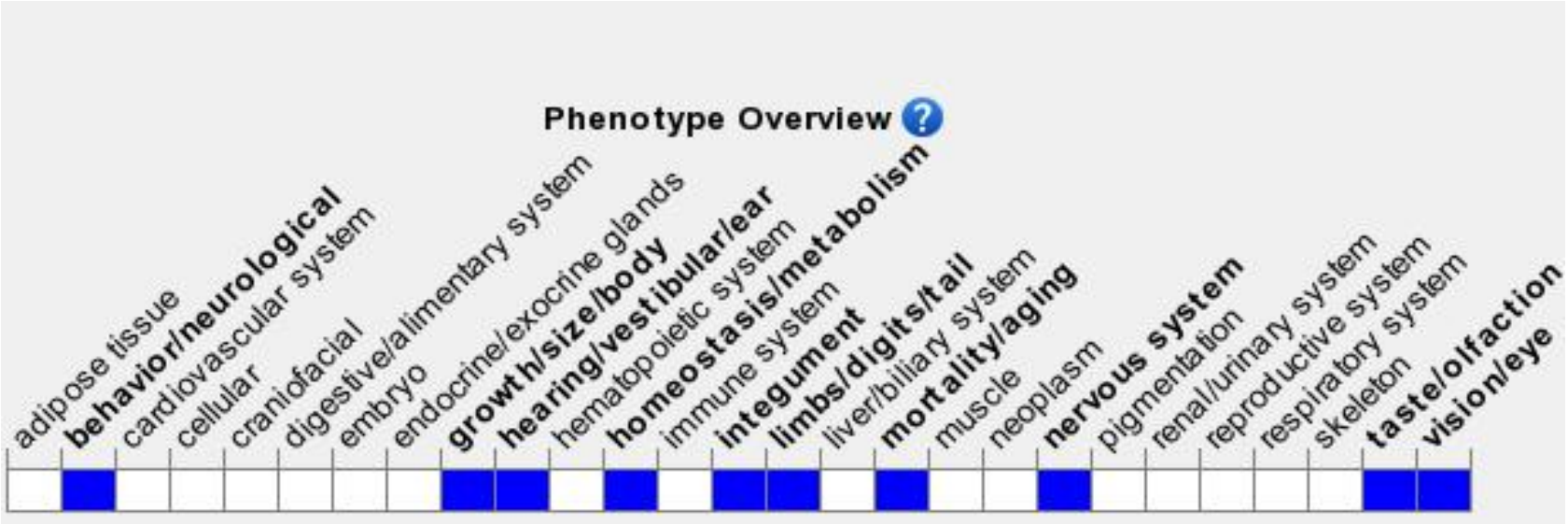
Genomic location distribution



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 carrying various deletions of exons encoding the ankyrin repeats (exons 4-9) exhibit a range of synaptic and autism-related impairments. Homozygotes lacking exon 9 show altered excitation/inhibition balance, increased rearing, and mildly impaired spatial memory.

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