

Sema6b Cas9-CKO Strategy

Designer:

Huan Fan

Reviewer:

Huan Wang

Design Date:

2020-3-2

Project Overview

Project Name

Sema6b

Project type

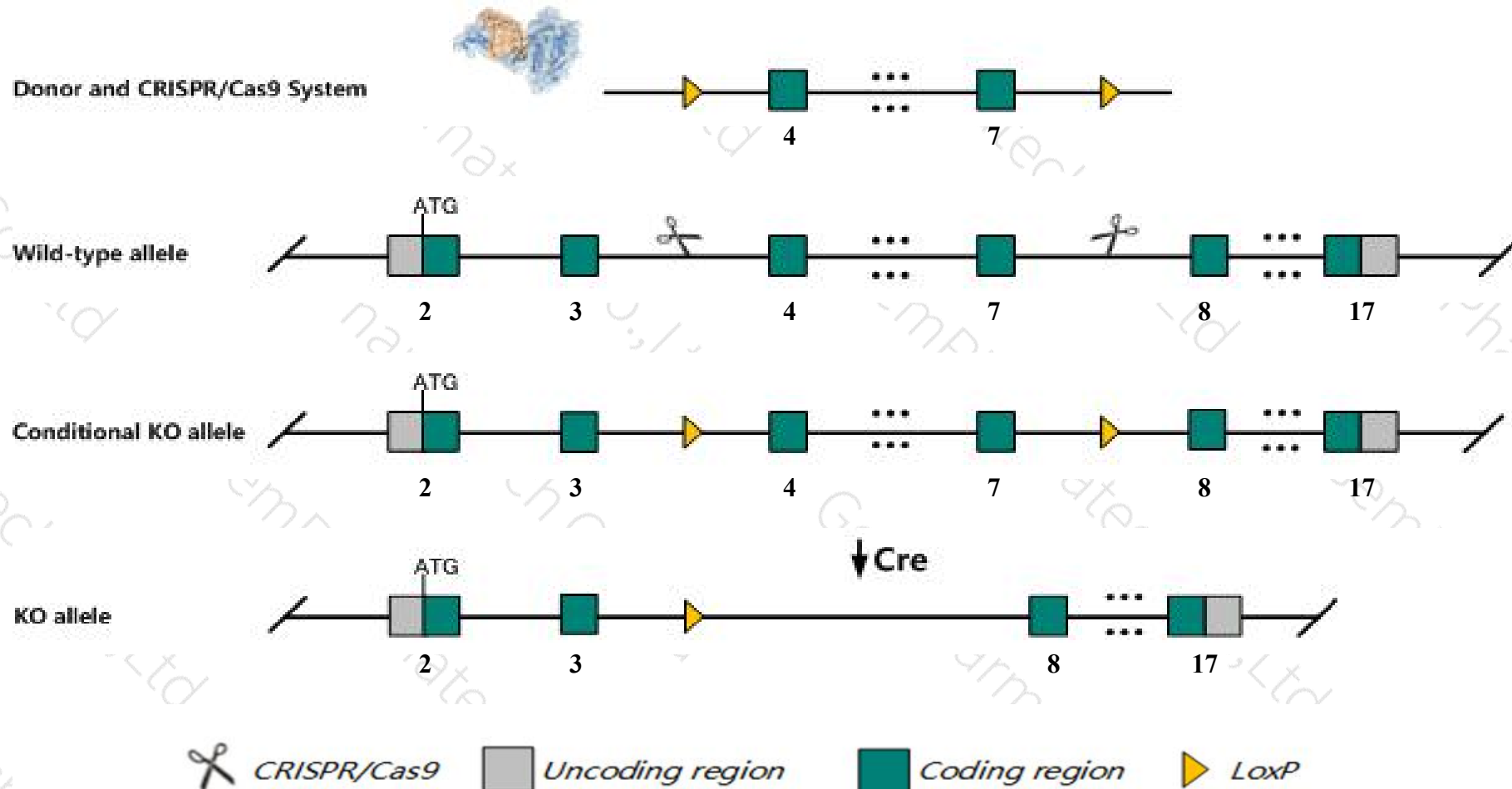
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Sema6b* gene. The schematic diagram is as follows:



- The *Sema6b* gene has 2 transcripts. According to the structure of *Sema6b* gene, exon4-exon7 of *Sema6b-201* (ENSMUST00000001256.10) transcript is recommended as the knockout region. The region contains 317bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Sema6b* gene. The brief process is as follows: CRISPR/Cas9 system 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.

- According to the existing MGI data, Mice homozygous for a knock-out allele exhibit abnormal mossy fiber and mossy cell axon projections, thickened suprapyramidal bundles, and elongated infrapyramidal bundles.
- The *Sema6b* gene is located on the Chr17. 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)

Sema6b sema domain, transmembrane domain (TM), and cytoplasmic domain, (semaphorin) 6B [Mus musculus (house mouse)]

Gene ID: 20359, updated on 31-Jan-2019

Summary



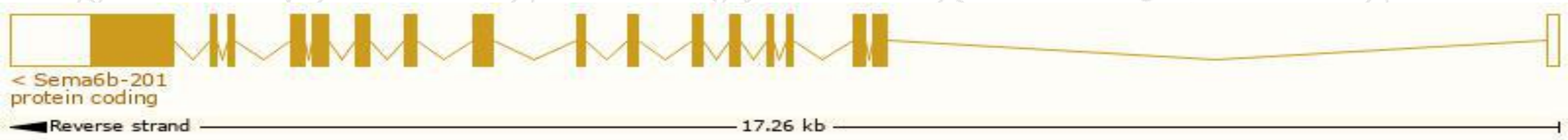
Official Symbol	Sema6b provided by MGI
Official Full Name	sema domain, transmembrane domain (TM), and cytoplasmic domain, (semaphorin) 6B provided by MGI
Primary source	MGI:MGI:1202889
See related	Ensembl:ENSMUSG00000001227
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Sema, Seman, Vlb, semaZ
Expression	Broad expression in frontal lobe adult (RPKM 19.8), cortex adult (RPKM 18.3) and 24 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

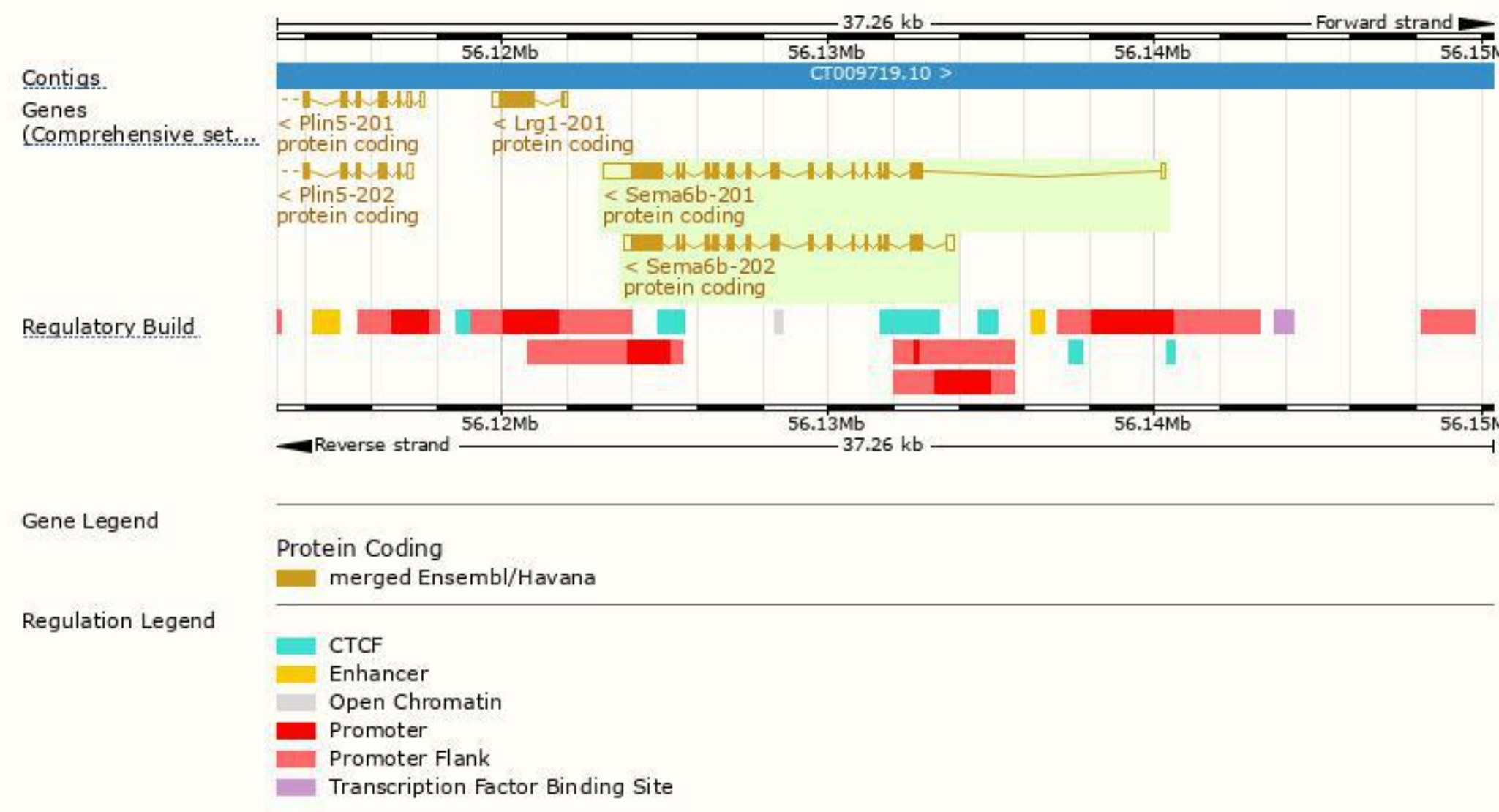
The gene has 2 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Sema6b-201	ENSMUST00000001256.10	3736	886aa	Protein coding	CCDS28896	Q54951 Q3UTK5	TSL:1 GENCODE basic APPRIS P1
Sema6b-202	ENSMUST00000167545.2	3156	886aa	Protein coding	CCDS28896	Q54951 Q3UTK5	TSL:1 GENCODE basic APPRIS P1

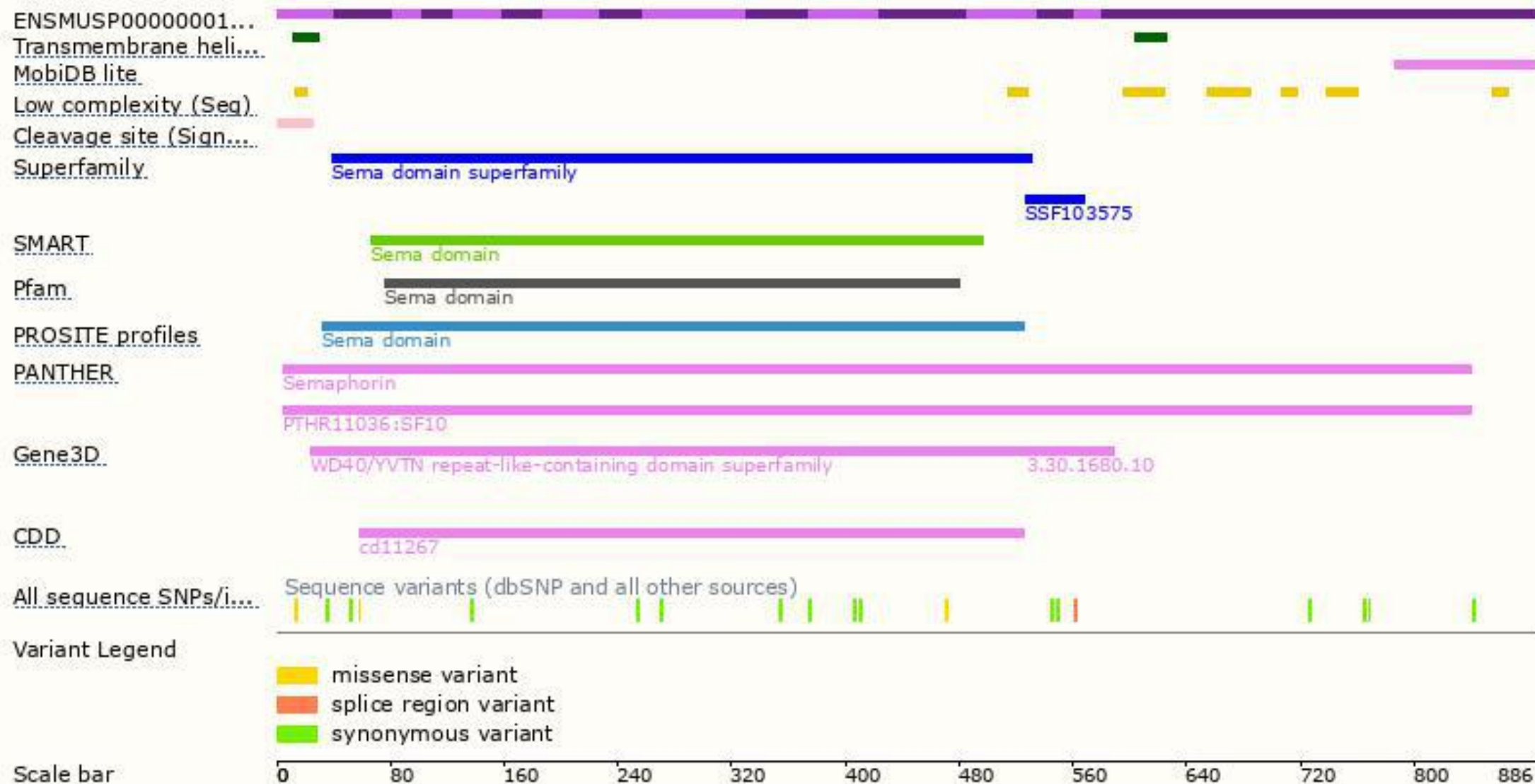
The strategy is based on the design of *Sema6b-201* transcript,The transcription is shown below



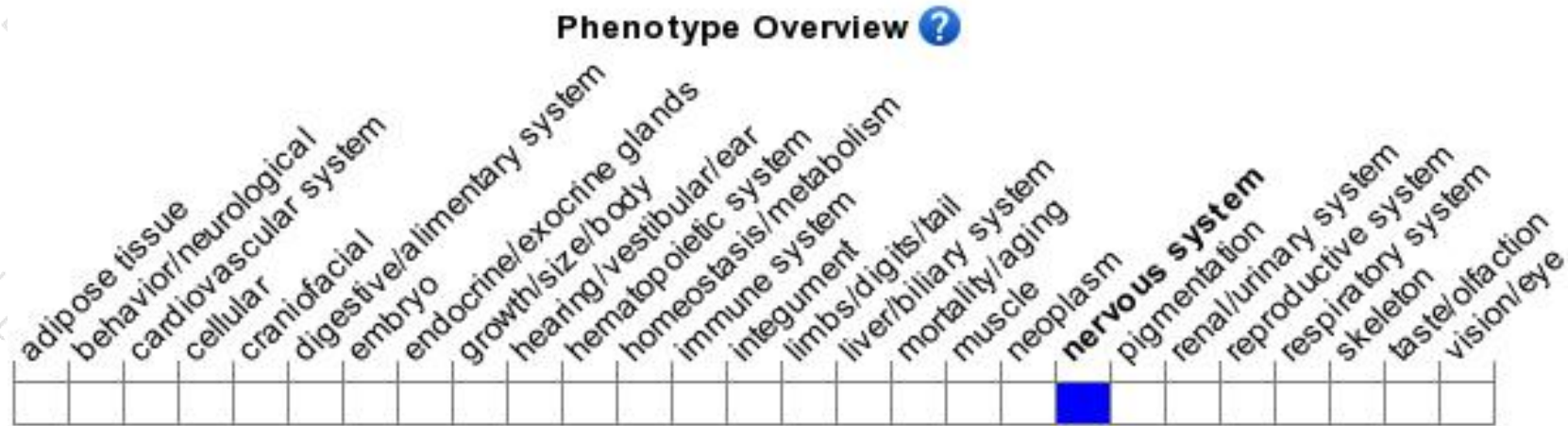
Genomic location distribution



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 abnormal mossy fiber and mossy cell axon projections, thickened suprapyramidal bundles, and elongated infrapyramidal bundles.

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

Tel: 400-9660890

