

# ***Plxna2 Cas9-KO Strategy***

**Designer:**

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# Project Overview

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**Project Name**

*Plxna2*

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**Project type**

**Cas9-KO**

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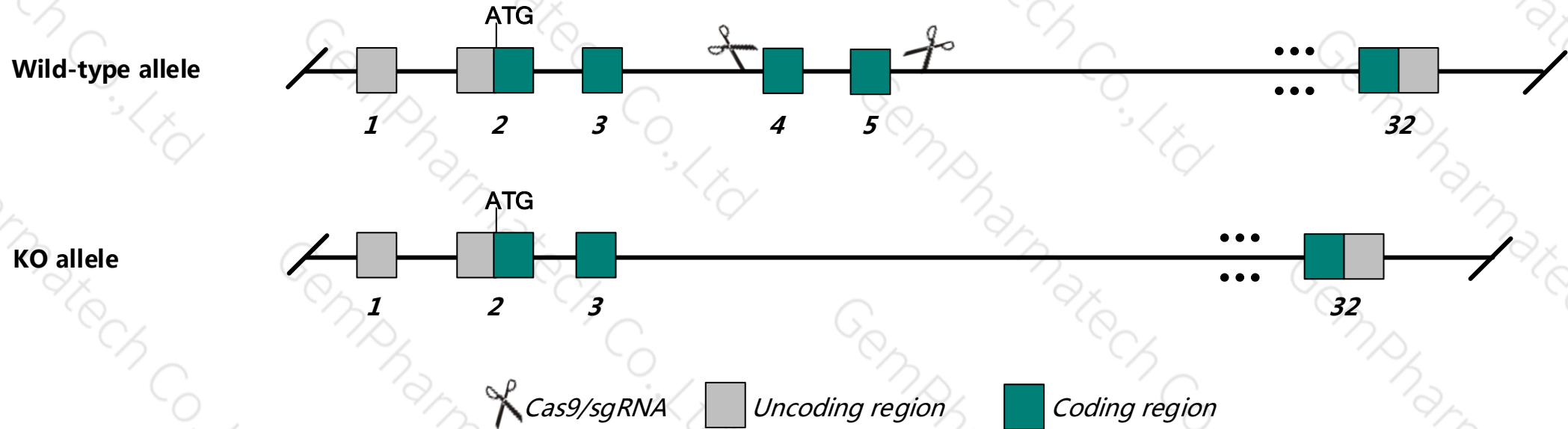
**Strain background**

**C57BL/6JGpt**

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# Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Plxna2* gene. The schematic diagram is as follows:



# Technical routes

- The *Plxna2* gene has 5 transcripts. According to the structure of *Plxna2* gene, exon4-exon5 of *Plxna2*-201 (ENSMUST00000027952.11) transcript is recommended as the knockout region. The region contains 236bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Plxna2* gene. The brief process is as follows: sgRNA was transcribed in vitro. Cas9 and 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.

- According to the existing MGI data , Mice homozygous for a knock-out allele show abnormal granule cell migration in the adult cerebellum and aberrant projection of mossy fibers in hippocampal slices. Mice homozygous for an ENU-induced allele are smaller and show granule cell migration defects and mild ataxia with incomplete penetrance.
- The KO region contains functional region of the *2900035J10Rik* gene. Knockout the region may affect the function of *2900035J10Rik* gene.
- The *Plxna2* gene is located on the Chr1. 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, RNA splicing and protein translation cannot be predicted at the existing technology level.

# Gene information ( NCBI )

## Plxna2 plexin A2 [ *Mus musculus* (house mouse) ]

Gene ID: 18845, updated on 9-Jun-2019

### Summary

Official Symbol	Plxna2 provided by MGI
Official Full Name	plexin A2 provided by MGI
Primary source	MGI:MGI:107684
See related	Ensembl:ENSMUSG00000026640
Gene type	protein coding
RefSeq status	VALIDATED
Organism	<i>Mus musculus</i>
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	OCT; Plxn2; PlexA2; AA589422; AW457381; mKIAA0463; 2810428A13Rik
Expression	Broad expression in CNS E14 (RPKM 20.1), whole brain E14.5 (RPKM 19.4) and 25 other tissues <a href="#">See more</a>
Orthologs	<a href="#">human</a> <a href="#">all</a>

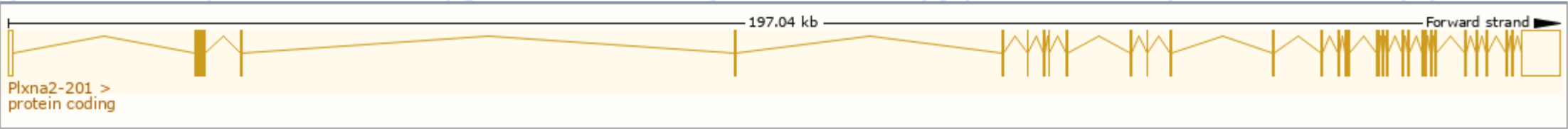
# Transcript information ( Ensembl )



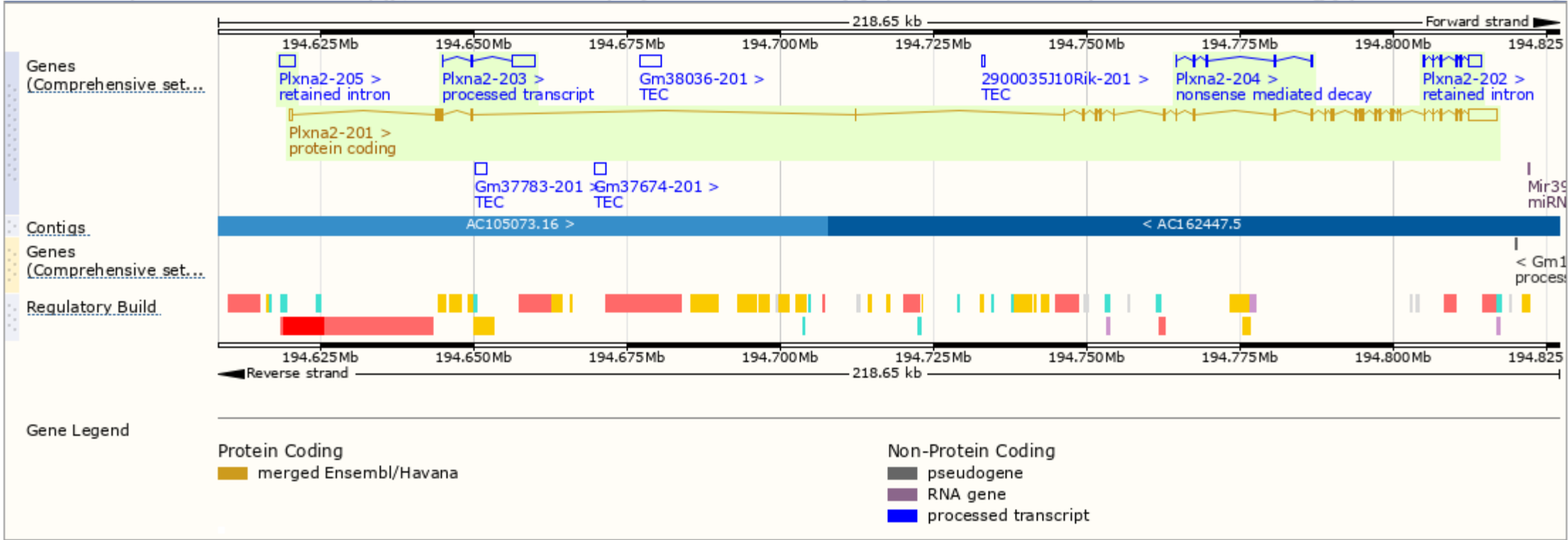
The gene has 5 transcripts, and all transcripts are shown below:

Show/hide columns (1 hidden)							Filter	
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags	
Plxna2-201	<a href="#">ENSMUST00000027952.11</a>	11040	<a href="#">1894aa</a>	Protein coding	<a href="#">CCDS35827</a>	<a href="#">P70207</a>	TSL:1	GENCODE basic APPRIS P1
Plxna2-204	<a href="#">ENSMUST00000135664.1</a>	605	<a href="#">83aa</a>	Nonsense mediated decay	-	<a href="#">F6VSI0</a>	CDS 5' incomplete	TSL:5
Plxna2-203	<a href="#">ENSMUST00000125381.1</a>	3951	No protein	Processed transcript	-	-	TSL:2	
Plxna2-202	<a href="#">ENSMUST00000124785.1</a>	3180	No protein	Retained intron	-	-	TSL:1	
Plxna2-205	<a href="#">ENSMUST00000194398.1</a>	2650	No protein	Retained intron	-	-	TSL:NA	

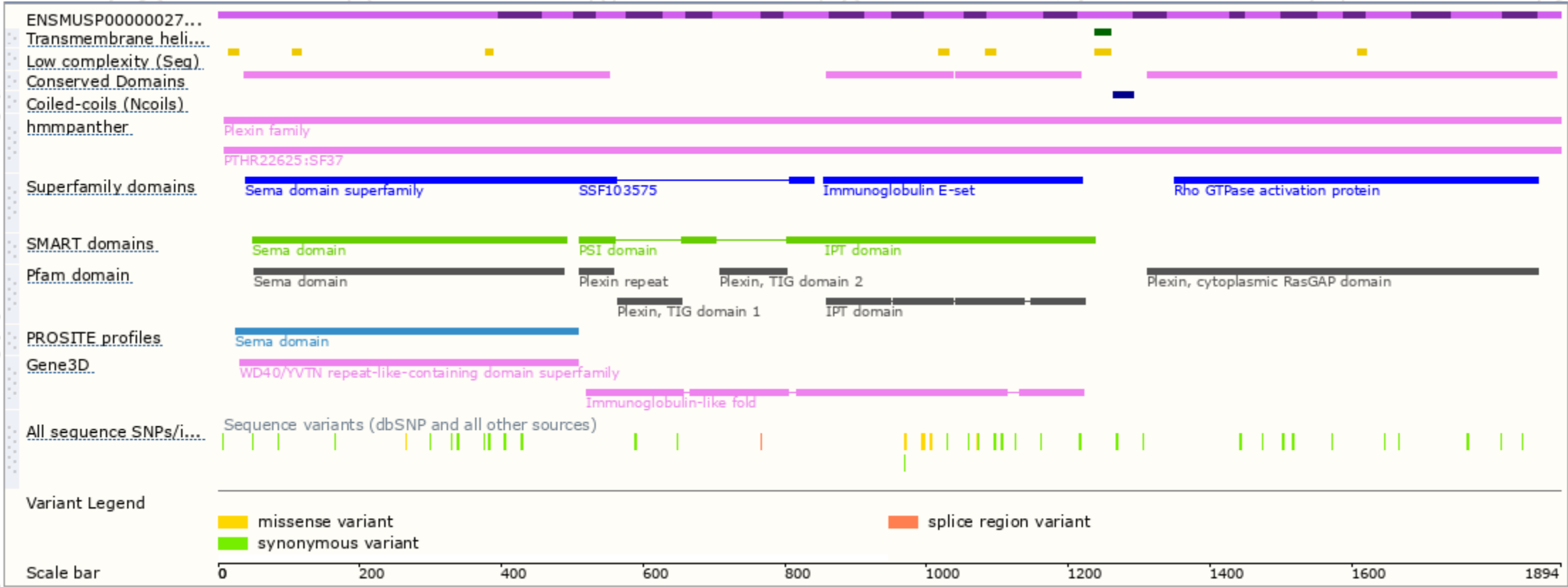
The strategy is based on the design of *Plxna2*-201 transcript, The transcription is shown below



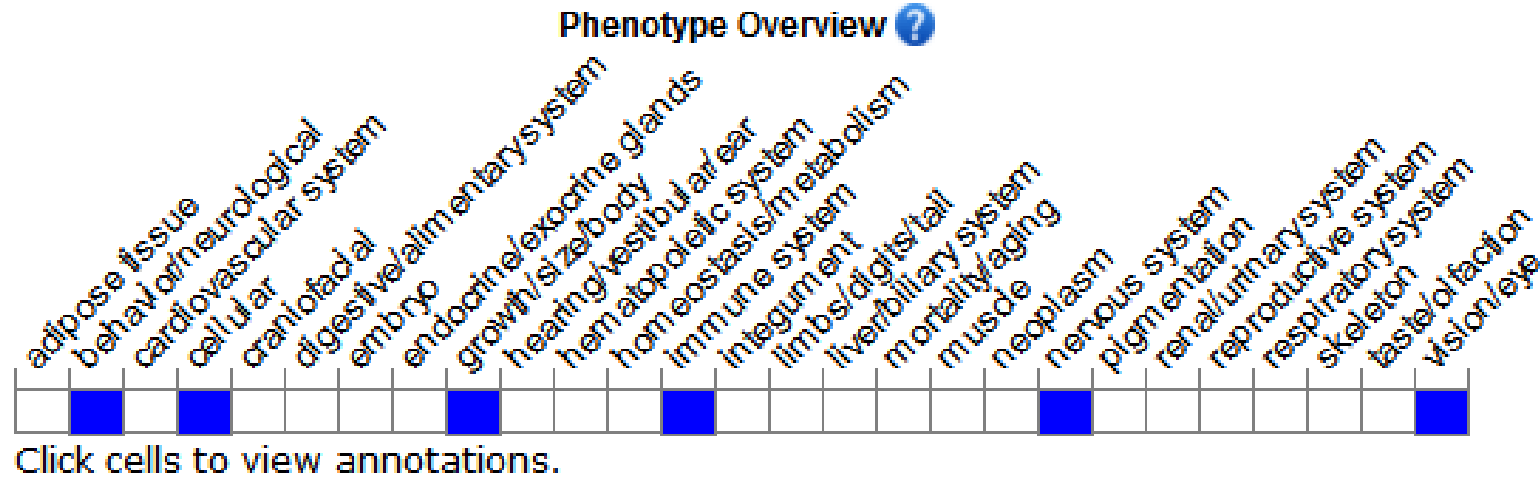
# Genomic location distribution



# 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 show abnormal granule cell migration in the adult cerebellum and aberrant projection of mossy fibers in hippocampal slices. Mice homozygous for an ENU-induced allele are smaller and show granule cell migration defects and mild ataxia with incomplete penetrance.

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