

# *Nrtn* Cas9-CKO Strategy

**Designer:**

**Yang Zeng**

**Reviewer:**

**Ruirui Zhang**

**Design Date:**

**2019-11-25**

# Project Overview

---

**Project Name**

*Nrtn*

---

**Project type**

**Cas9-CKO**

---

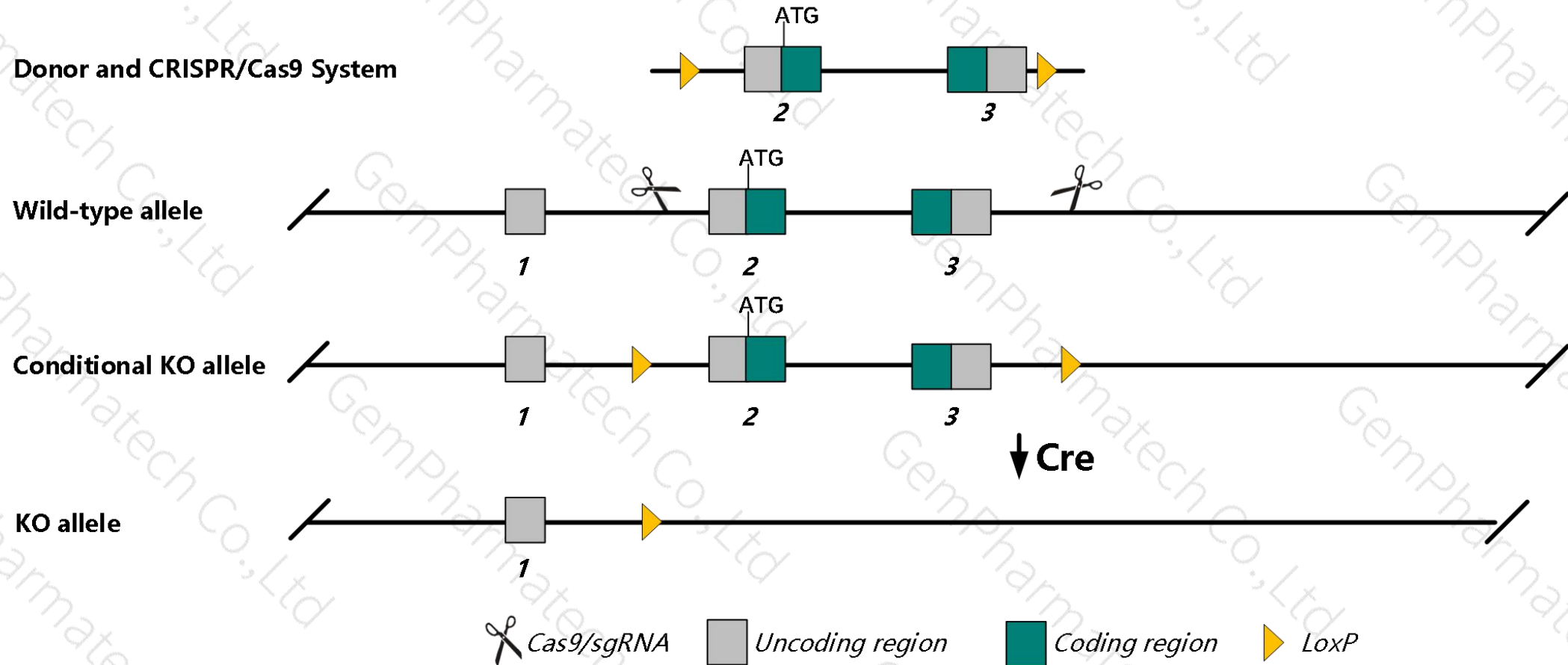
**Strain background**

**C57BL/6JGpt**

---

# Conditional Knockout strategy

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



# Technical routes

- The *Nrtn* gene has 1 transcript. According to the structure of *Nrtn* gene, exon2-exon3 of *Nrtn-201* (ENSMUST00000044752.5) transcript is recommended as the knockout region. The region contains all of coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Nrtn* 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 disruptions of this gene have drooping, thickened eyelids which are a manifestation of abnormalities in the parasympathetic system.
- The *Nrtn* 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)

## Nrtn neurturin [ *Mus musculus* (house mouse) ]

Gene ID: 18188, updated on 12-Aug-2019

### Summary

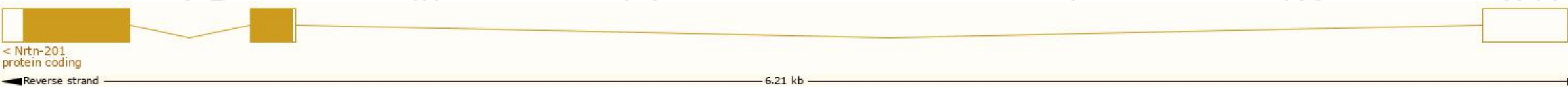
<b>Official Symbol</b>	Nrtn provided by <a href="#">MGI</a>
<b>Official Full Name</b>	neurturin provided by <a href="#">MGI</a>
<b>Primary source</b>	<a href="#">MGI:MGI:108417</a>
<b>See related</b>	<a href="#">Ensembl:ENSMUSG00000039481</a>
<b>Gene type</b>	protein coding
<b>RefSeq status</b>	REVIEWED
<b>Organism</b>	<a href="#">Mus musculus</a>
<b>Lineage</b>	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
<b>Also known as</b>	NTN
<b>Summary</b>	This gene encodes a secreted ligand of the TGF-beta (transforming growth factor-beta) superfamily of proteins. The encoded preproprotein is proteolytically processed to generate the mature protein. This protein signals through the RET receptor tyrosine kinase and a GPI-linked coreceptor, and promotes survival of neuronal populations. Homozygous knockout mice for this gene exhibit defects in the development of the retina and enteric nervous system, and reduced cholinergic innervation of the heart and lacrimal glands. [provided by RefSeq, Aug 2016]
<b>Expression</b>	Broad expression in ovary adult (RPKM 87.5), stomach adult (RPKM 66.3) and 15 other tissues <a href="#">See more</a>
<b>Orthologs</b>	<a href="#">human</a> <a href="#">all</a>

# Transcript information (Ensembl)

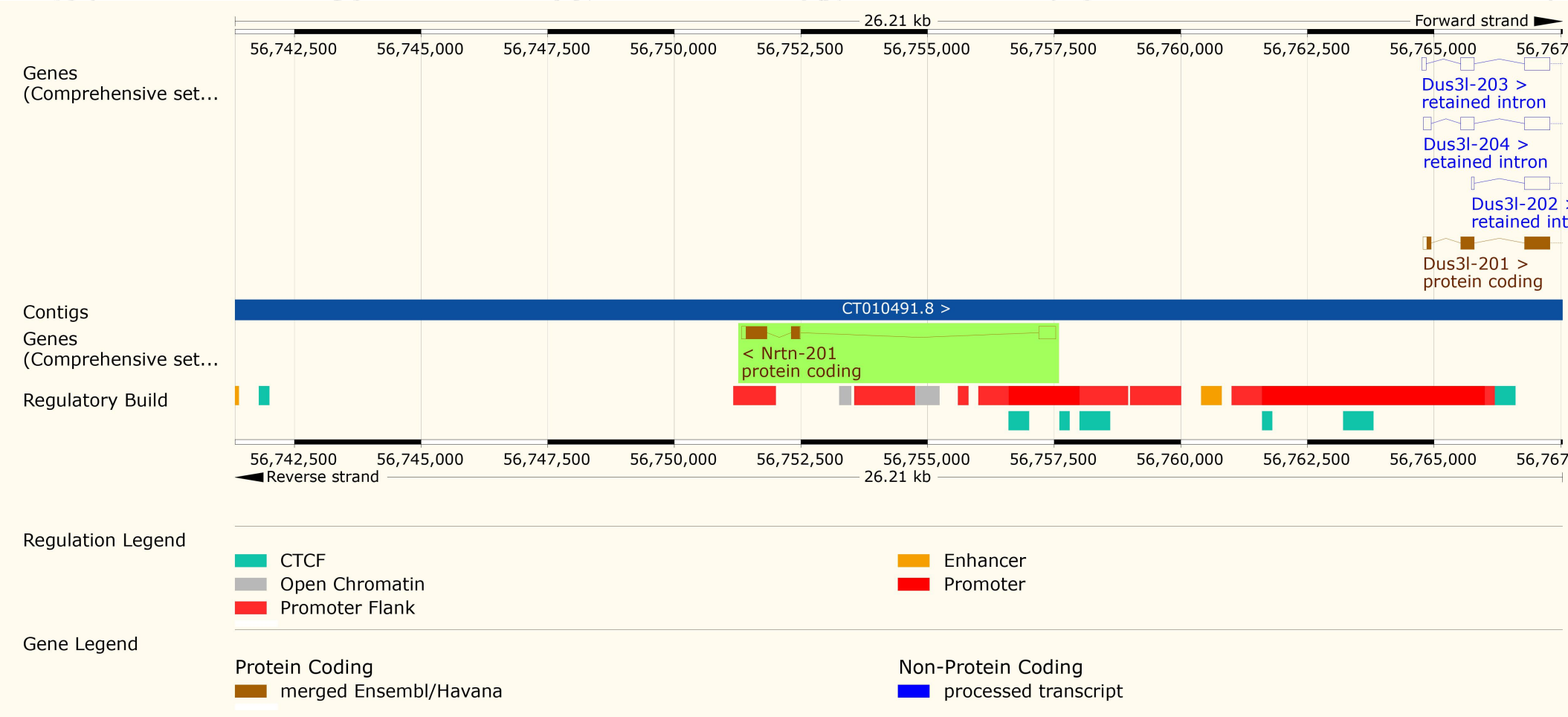
The gene has 1 transcript, and the transcript is shown below:

Name	Transcript ID	bp	Protein	Translation ID	Biotype	CCDS	UniProt	Flags
Nrtn-201	<a href="#">ENSMUST00000044752.5</a>	1023	<a href="#">195aa</a>	<a href="#">ENSMUSP00000046512.5</a>	Protein coding	<a href="#">CCDS28913</a>	<a href="#">P97463</a>	TSL:1 Gencode basic APPRIS P1

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

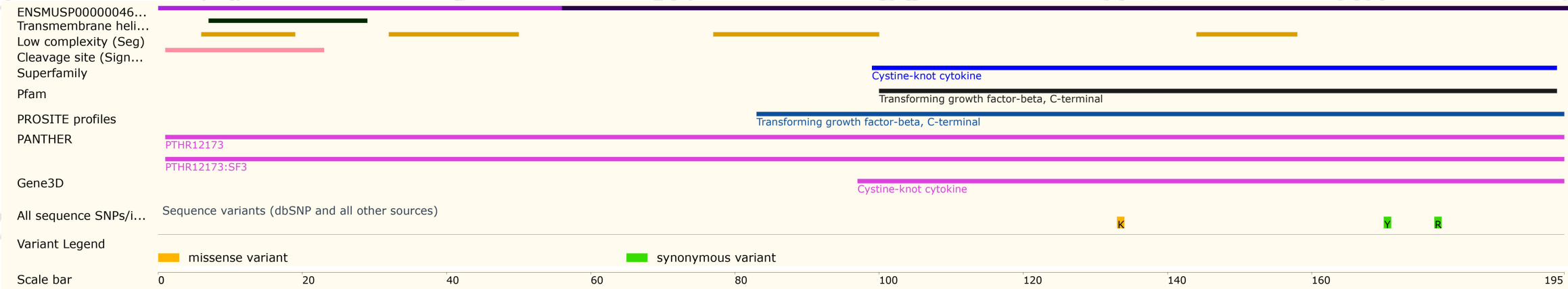


# Genomic location distribution



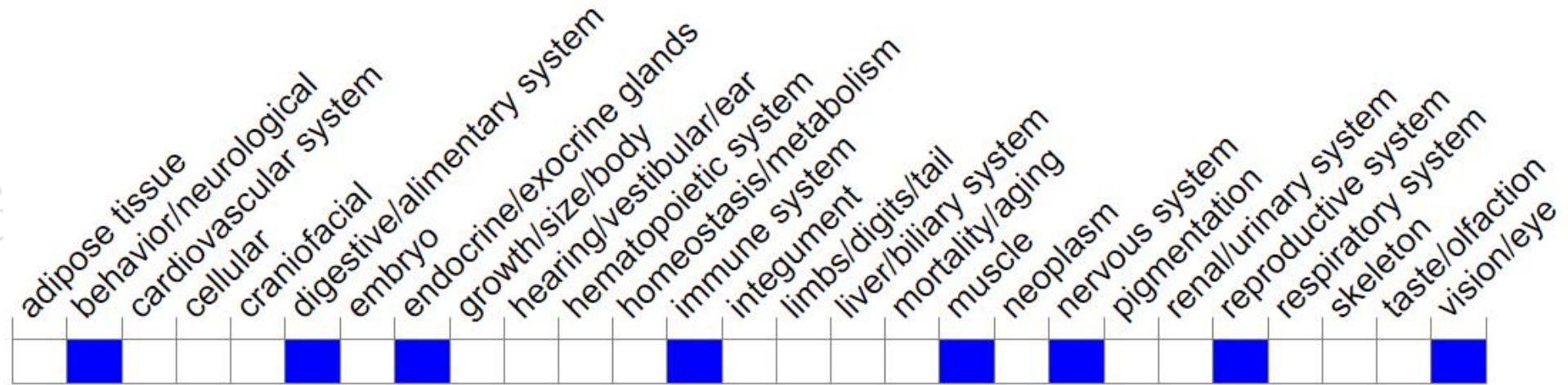


# Protein domain



# Mouse phenotype description(MGI)

## Phenotype Overview ?



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 disruptions of this gene have drooping, thickened eyelids which are a manifestation of abnormalities in the parasympathetic system.

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

Tel: 400-9660890

