

# ***Ctf1 Cas9-KO Strategy***

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**Reviewer:**

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# Project Overview

**Project Name**

**Ctf1**

**Project type**

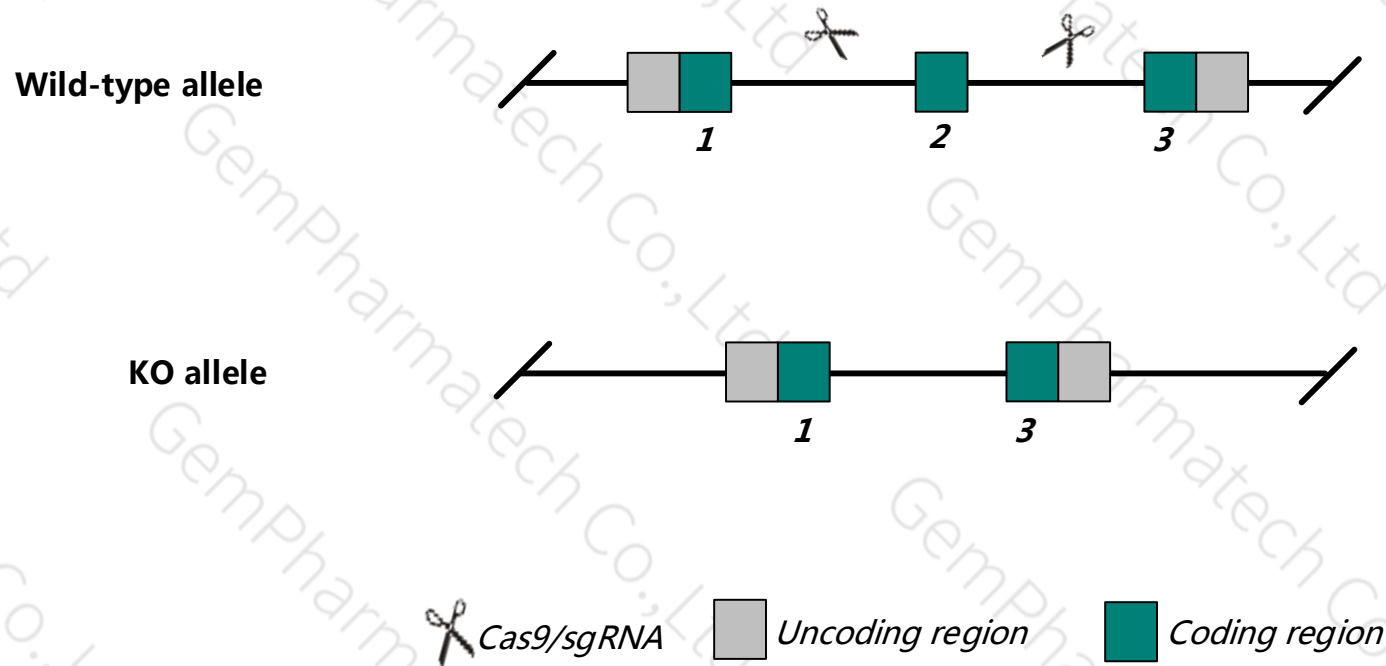
**Cas9-KO**

**Strain background**

**C57BL/6JGpt**

# Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Ctf1* gene. The schematic diagram is as follows:



- The *Ctf1* gene has 5 transcripts. According to the structure of *Ctf1* gene, the exon2 of *Ctf1-201* (ENSMUST00000047393.6) transcript is recommended as the knockout region. The region contains 119bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Ctf1* 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 a significant reduction in grip strength and increased motoneuron cell death in the spinal cord and brainstem nuclei between embryonic day 14 and the first postnatal week.
- The *Ctf1* gene is located on the Chr7. 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 )

## Ctf1 cardiotrophin 1 [ *Mus musculus* (house mouse) ]

Gene ID: 13019, updated on 12-Aug-2019

### Summary

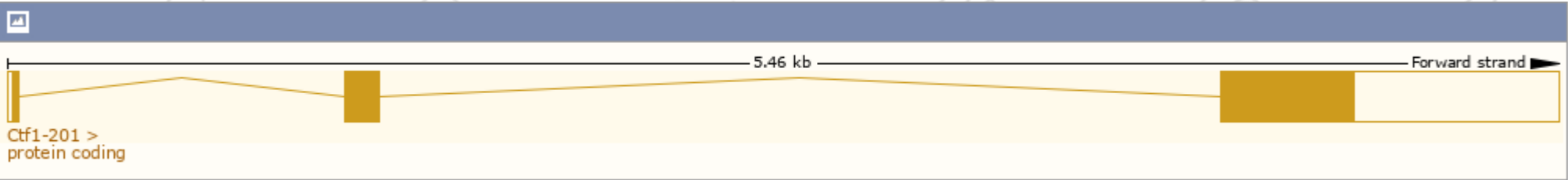
|                    |                                                                                                                                                                           |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Official Symbol    | Ctf1 provided by <a href="#">MGI</a>                                                                                                                                      |
| Official Full Name | cardiotrophin 1 provided by <a href="#">MGI</a>                                                                                                                           |
| Primary source     | <a href="#">MGI:MGI:105115</a>                                                                                                                                            |
| See related        | <a href="#">Ensembl:ENSMUSG000000042340</a>                                                                                                                               |
| Gene type          | protein coding                                                                                                                                                            |
| RefSeq status      | VALIDATED                                                                                                                                                                 |
| Organism           | <a href="#">Mus musculus</a>                                                                                                                                              |
| Lineage            | Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus |
| Also known as      | CT-1                                                                                                                                                                      |
| Expression         | Ubiquitous expression in limb E14.5 (RPKM 16.6), ovary adult (RPKM 10.7) 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             |                         |
| Ctf1-201                     | <a href="#">ENSMUST00000047393.6</a> | 1352 | <a href="#">203aa</a> | Protein coding | <a href="#">CCDS21875</a> | <a href="#">Q541U3</a> <a href="#">Q60753</a> | TSL:1             | GENCODE basic APPRIS P1 |
| Ctf1-204                     | <a href="#">ENSMUST00000206506.1</a> | 784  | <a href="#">196aa</a> | Protein coding | <a href="#">CCDS85423</a> | <a href="#">A0A0U1RNJ2</a>                    | TSL:2             | GENCODE basic           |
| Ctf1-205                     | <a href="#">ENSMUST00000206997.1</a> | 528  | <a href="#">149aa</a> | Protein coding | -                         | <a href="#">A0A0U1RQ09</a>                    | CDS 3' incomplete | TSL:3                   |
| Ctf1-203                     | <a href="#">ENSMUST00000206073.1</a> | 450  | No protein            | lncRNA         | -                         | -                                             | TSL:5             |                         |
| Ctf1-202                     | <a href="#">ENSMUST00000205655.1</a> | 285  | No protein            | lncRNA         | -                         | -                                             | TSL:5             |                         |

The strategy is based on the design of *Ctf1-201* transcript, The transcription is shown below

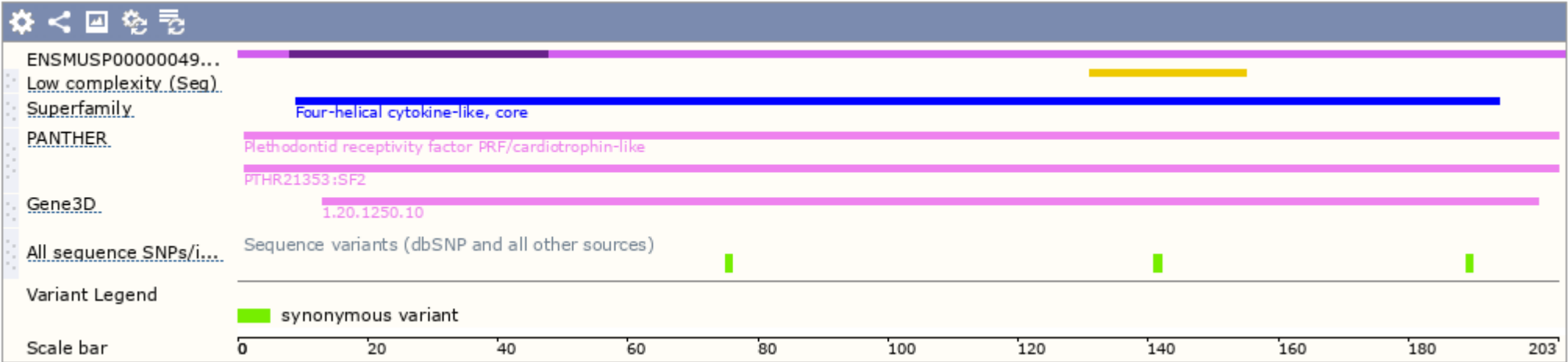




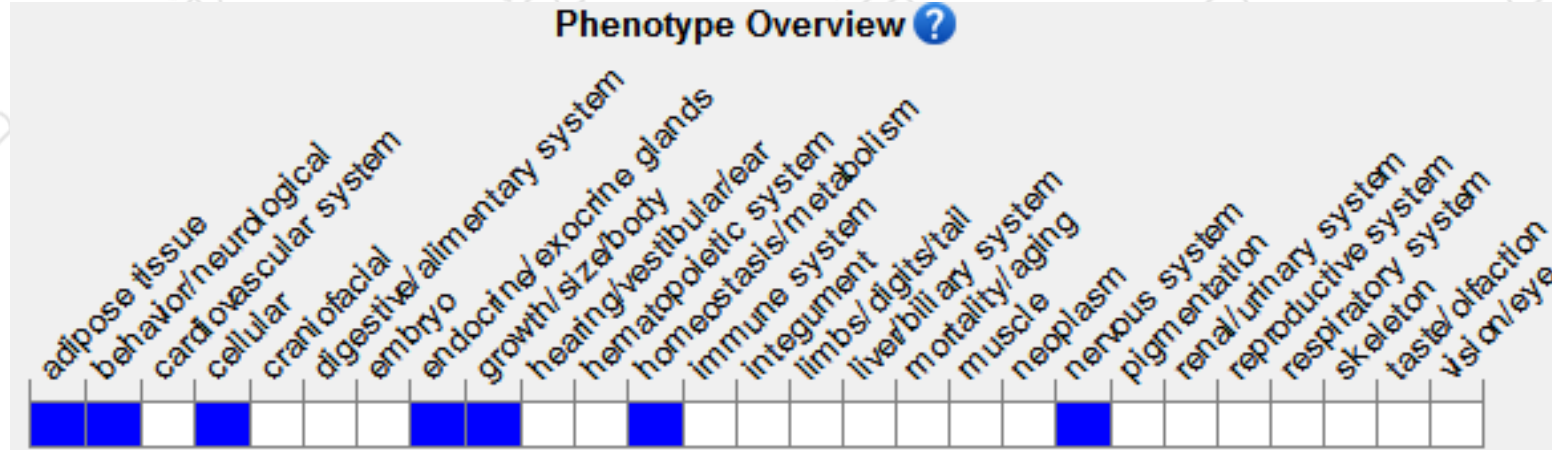
集萃药康  
GemPharmatech



# 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/>) .*

Mice homozygous for a knock-out allele show a significant reduction in grip strength and increased motoneuron cell death in the spinal cord and brainstem nuclei between embryonic day 14 and the first postnatal week.

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