GemPharmatech™

Gdf10 Cas9-CKO Strategy

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Overview

Target Gene Name

- *Gdf10*

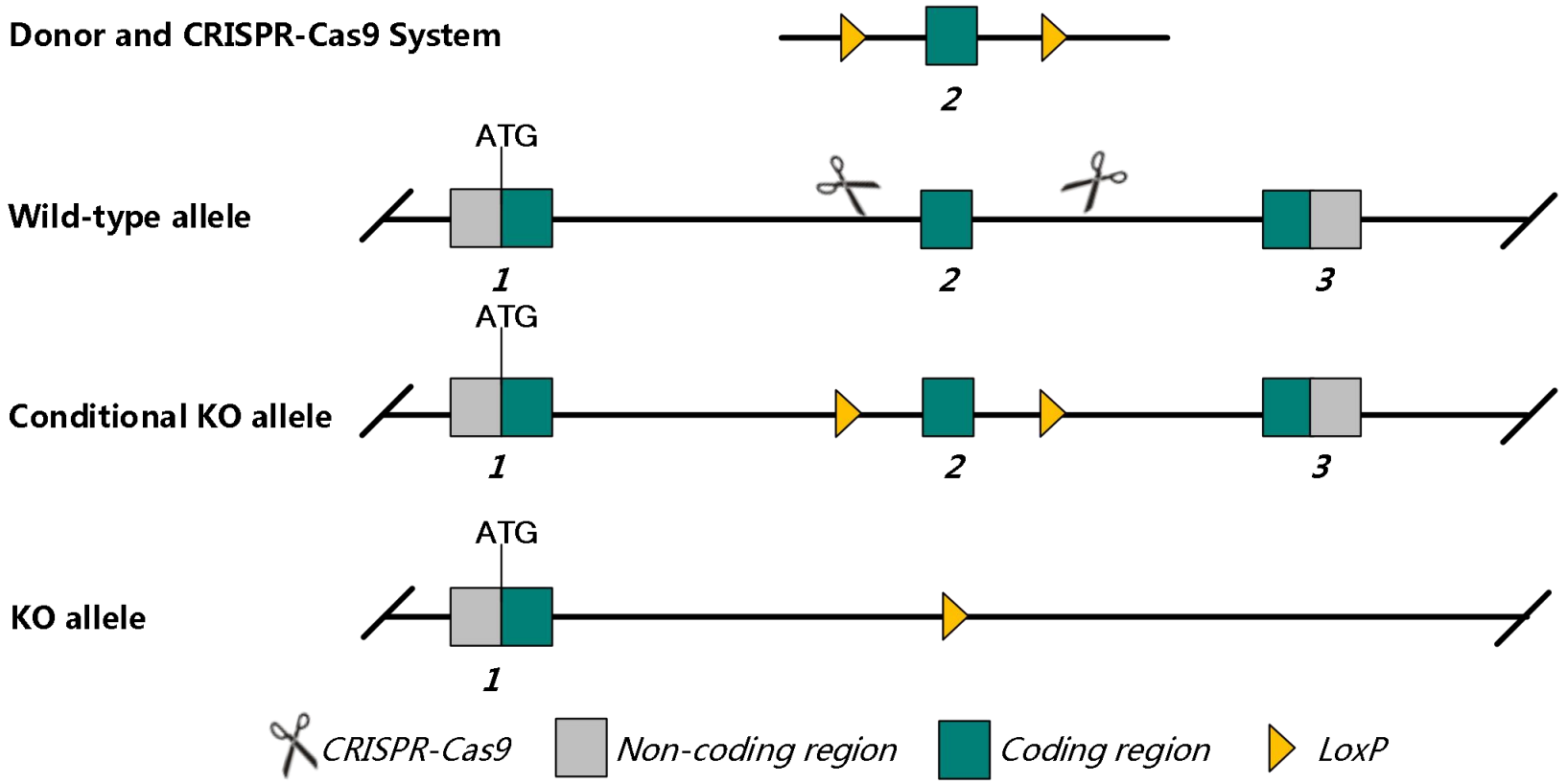
Project Type

- Cas9-CKO

Genetic Background

- C57BL/6JGpt

Strain Strategy



Schematic representation of CRISPR-Cas9 engineering used to edit the *Gdf10* gene.

Technical Information

- The *Gdf10* gene has 1 transcript. According to the structure of *Gdf10* gene, exon2 of *Gdf10-201*(ENSMUST00000168727.3) transcript is recommended as the knockout region. The region contains 932 bp coding sequence. Knocking out the region will result in disruption of protein function.
- In this project we use CRISPR-Cas9 technology to modify *Gdf10* 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 on-target amplicon sequencing. A stable F1-generation mouse strain was obtained by mating positive F0-generation mice with C57BL/6JGpt mice and confirmation of the desired mutant allele was carried out by PCR and on-target amplicon sequencing.
- 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.

Gene Information

Gdf10 growth differentiation factor 10 [Mus musculus (house mouse)]

Gene ID: 14560, updated on 5-Jul-2022

Summary

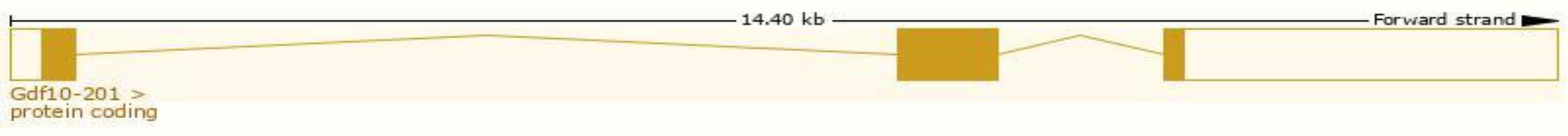
Official Symbol	Gdf10 provided by MGI
Official Full Name	growth differentiation factor 10 provided by MGI
Primary source	MGI:MGI:95684
See related	Ensembl:ENSMUSG00000021943
Gene type	protein coding
RefSeq status	REVIEWED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Bmp3b
Summary	This gene encodes a secreted ligand of the TGF-beta (transforming growth factor-beta) superfamily of proteins. Ligands of this family bind various TGF-beta receptors leading to recruitment and activation of SMAD family transcription factors that regulate gene expression. The encoded preproprotein is proteolytically processed to generate each subunit of the disulfide-linked homodimer. This protein has been shown to promote neural repair after stroke and may act as a tumor suppressor. [provided by RefSeq, Jul 2016]
Expression	Broad expression in adrenal adult (RPKM 52.5), limb E14.5 (RPKM 47.1) and 18 other tissues See more
Orthologs	human all

Transcript Information

The gene has 1 transcript, all transcripts are shown below:

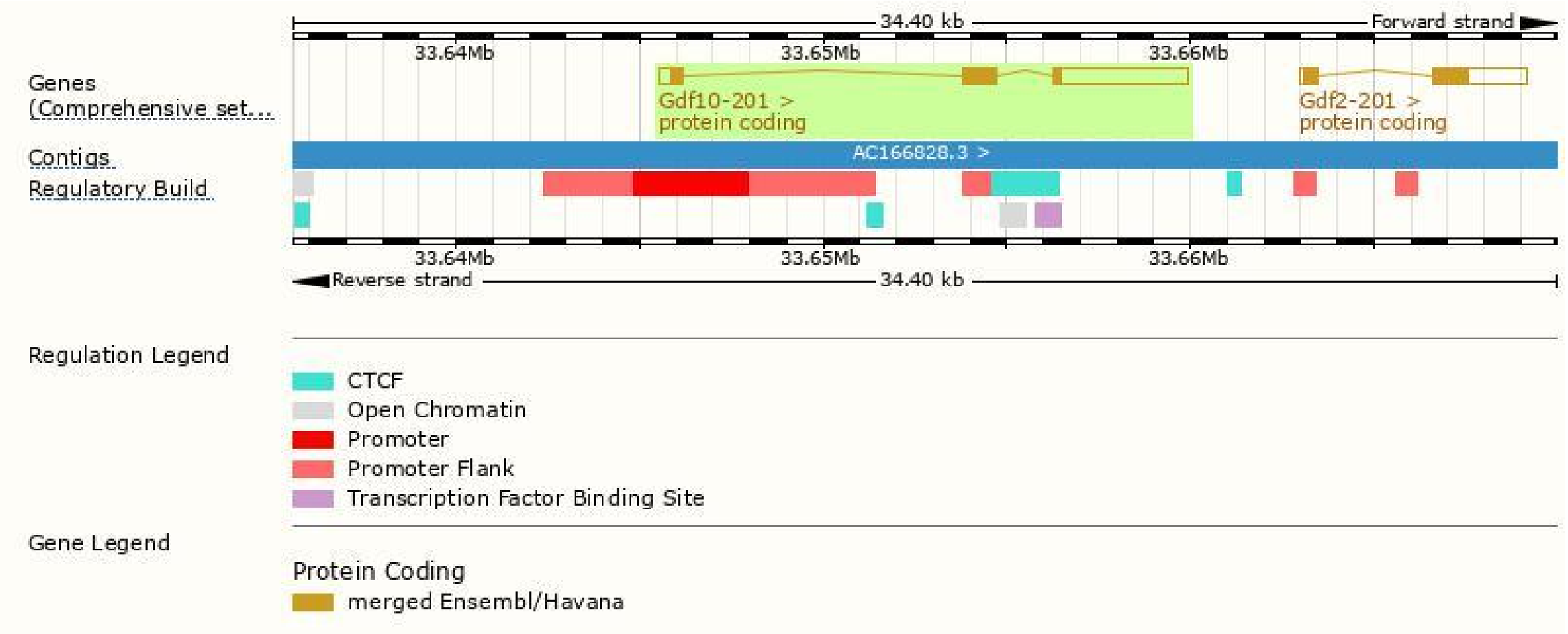
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Gdf10-201	ENSMUST00000168727.3	5210	476aa	Protein coding	CCDS26927		TSL:1 , GENCODE basic , APPRIS P1 ,

The strategy is based on the design of *Gdf10*-201 transcript, the transcription is shown below:



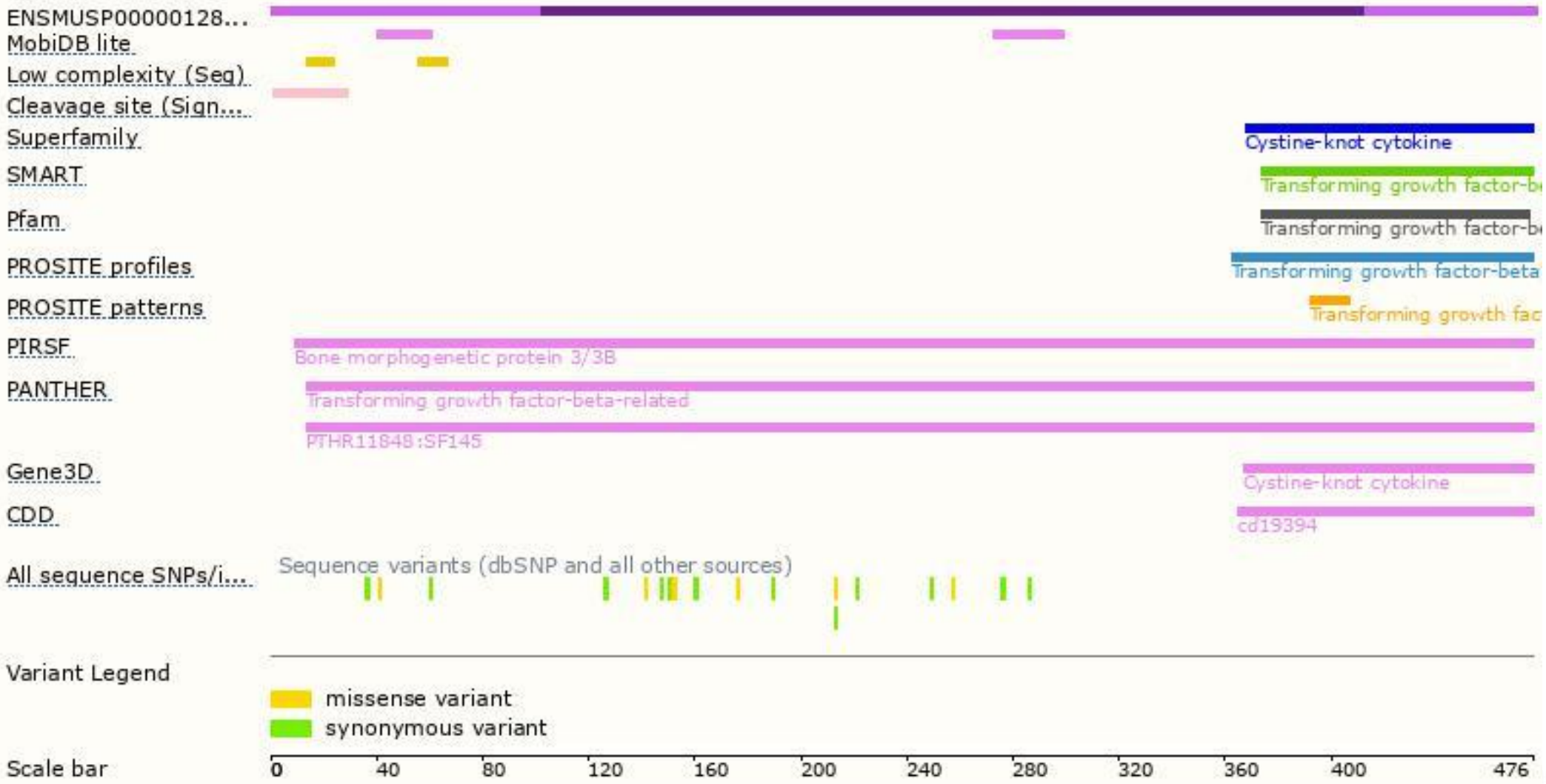
Source: https://www.ensembl.org

Genomic Information



Source: : https://www.ensembl.org

Protein Information



Source: : https://www.ensembl.org

Mouse Phenotype Information (MGI)

- Mice homozygous for disruption of this gene display a normal phenotype.

Source: https://www.informatics.jax.org

Important Information

- Accoding of MGI, mice homozygous for disruption of this gene display a normal phenotype.
- The insertion site was about 7.5 KB from the 5 end of *Gdf2* gene, and this strategy may affect the regulation of the 5 end of *Gdf2* gene.
- *Gdf10* is located on Chr14. If the knockout mice are crossed with other mouse strains to obtain double homozygous mutant offspring, please avoid the situation that the second gene is on the same chromosome.
- This Strategy is designed based on genetic information in existing databases. Due to the complexity of biological processes, all risks of the mutation on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.