

Gdf6 Cas9-CKO Strategy

Designer:

JiaYu

Reviewer:

Xiaojing Li

Design Date:

2020-1-20

Project Overview

Project Name

Gdf6

Project type

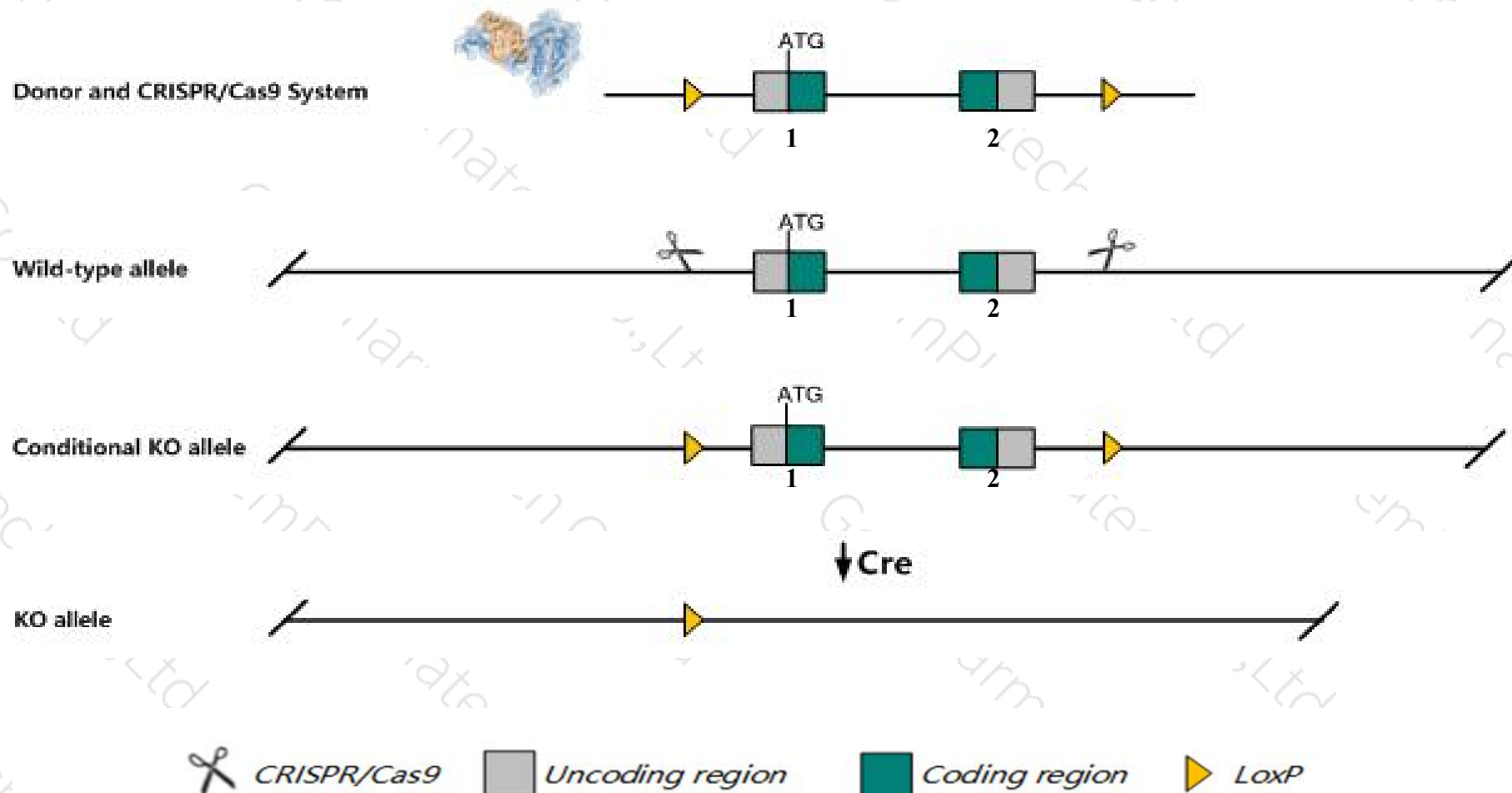
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Gdf6* gene. The schematic diagram is as follows:



Technical routes

- The *Gdf6* gene has 1 transcript. According to the structure of *Gdf6* gene, exon1-exon2 of *Gdf6-201* (ENSMUST00000057613.2) transcript is recommended as the knockout region. The region contains all of the coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Gdf6* 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, Homozygous null mice show multiple joint and skeletal patterning defects affecting the extremities, inner ear, and skull.
- The *Gdf6* gene is located on the Chr4. 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)

Gdf6 growth differentiation factor 6 [Mus musculus (house mouse)]

Gene ID: 242316, updated on 31-Jan-2019

Summary



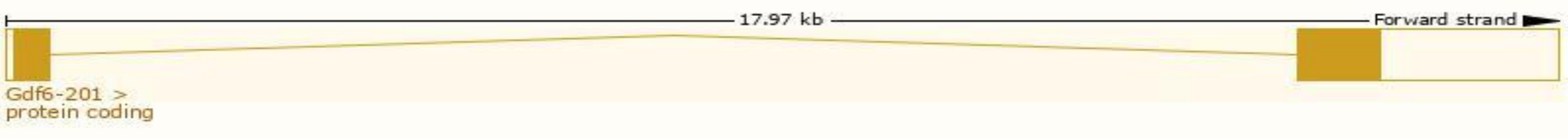
Official Symbol	Gdf6 provided by MGI
Official Full Name	growth differentiation factor 6 provided by MGI
Primary source	MGI:MGI:95689
See related	Ensembl:ENSMUSG000000051279
Gene type	protein coding
RefSeq status	REVIEWED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	BMP-13, BMP13, GDF16
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 is required for normal formation of some bones and joints in the limbs, skull, and axial skeleton. Mice lacking a functional copy of this gene exhibit joint and skeletal defects. [provided by RefSeq, Sep 2016]
Expression	Biased expression in spleen adult (RPKM 5.5), limb E14.5 (RPKM 1.7) and 5 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

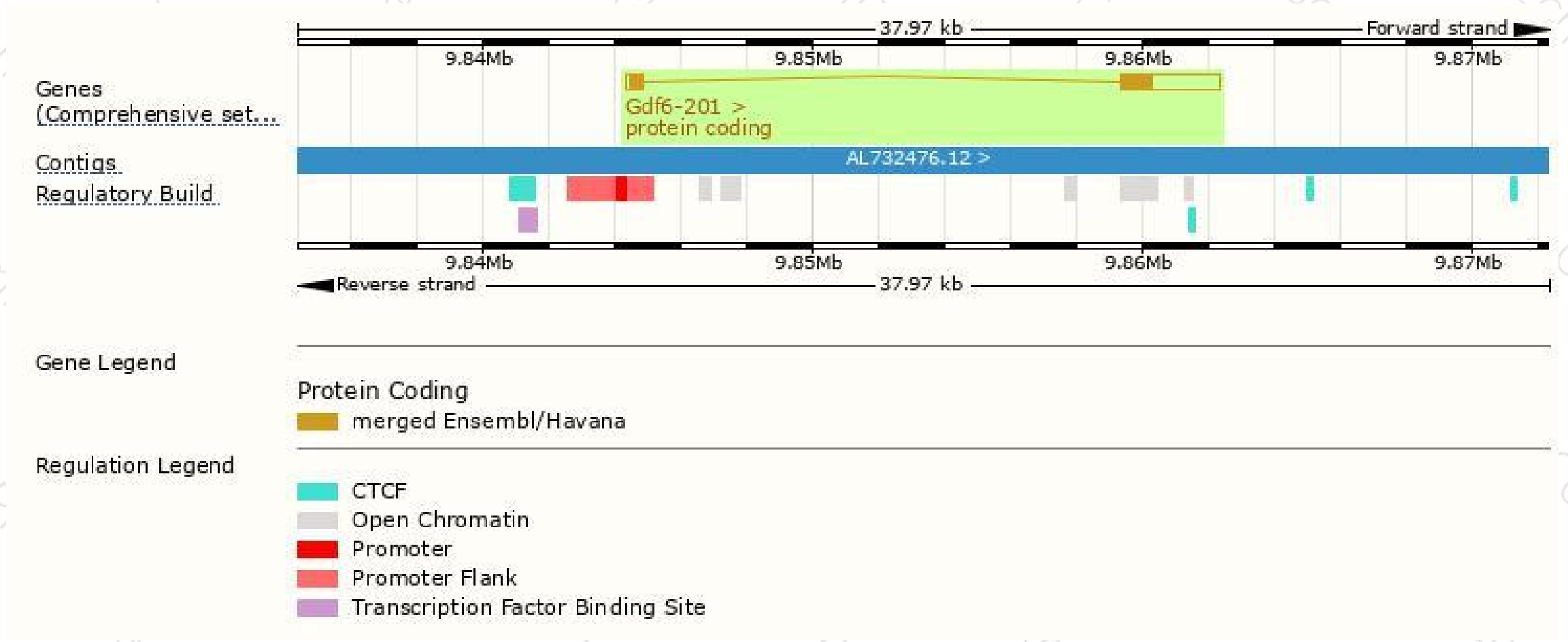
The gene has 1 transcript, and the transcript is shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Gdf6-201	ENSMUST00000057613.2	3532	454aa	Protein coding	CCDS17960	A2AII0 P43028	TSL:1 GENCODE basic APPRIS P1

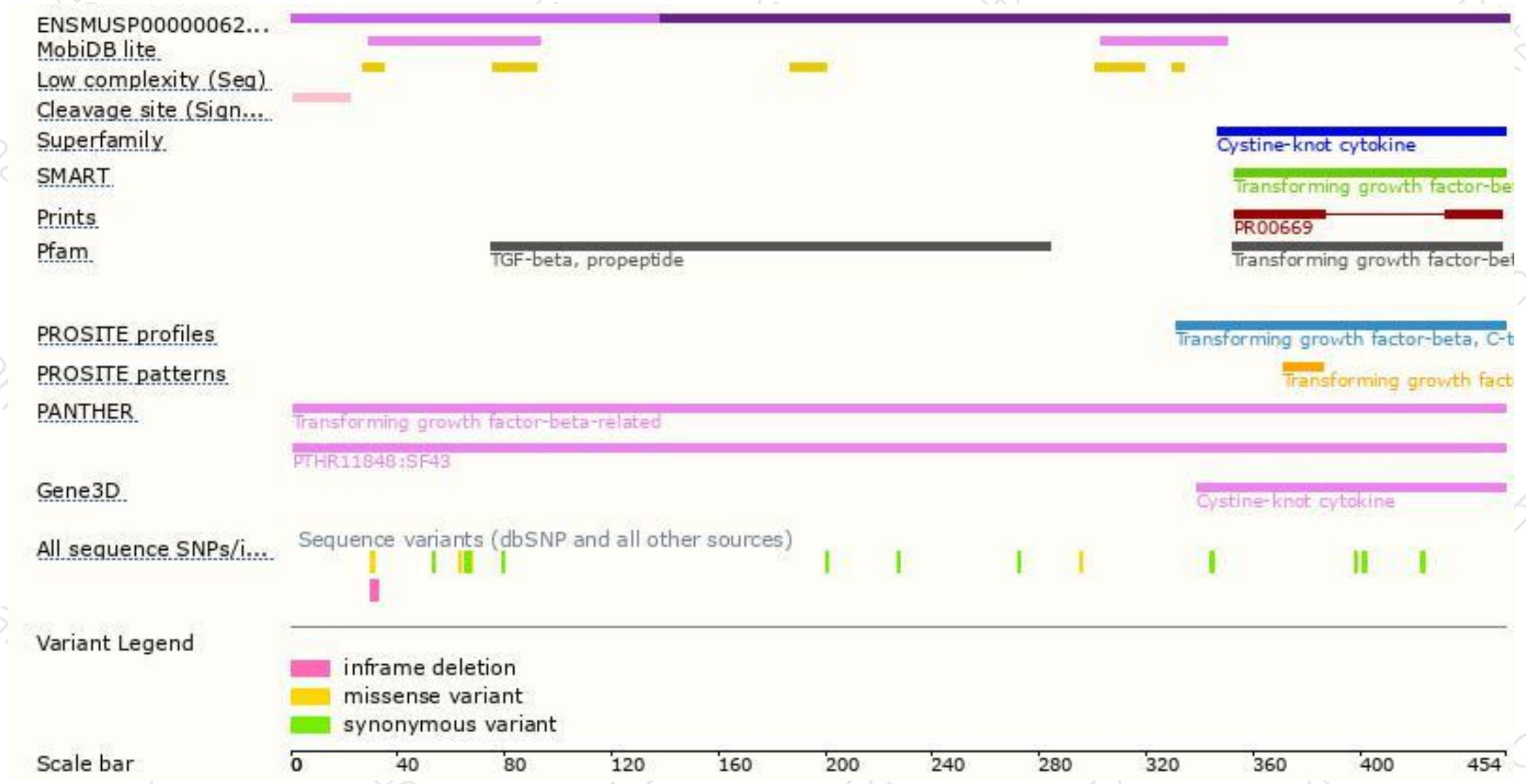
The strategy is based on the design of *Gdf6-201* transcript, The transcription is shown below



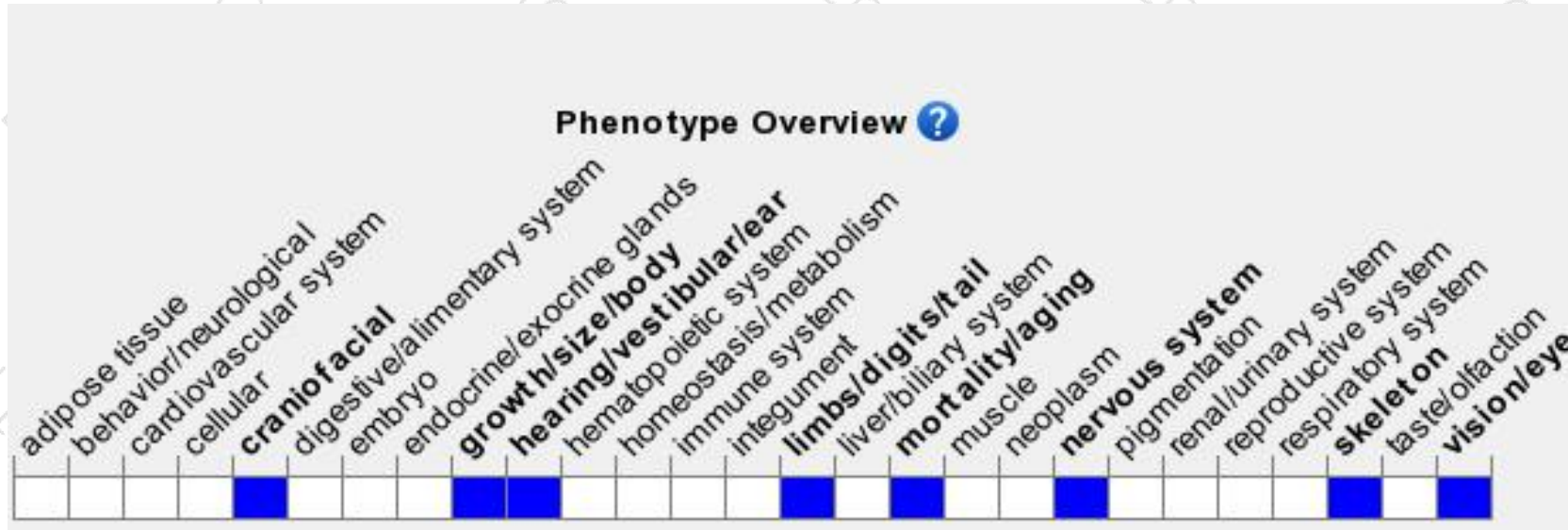
Genomic location distribution



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, Homozygous null mice show multiple joint and skeletal patterning defects affecting the extremities, inner ear, and skull.

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

Tel: 400-9660890

