Myo1c Cas9-KO Strategy

Designer: Daohua Xu
Reviewer: Huimin Su

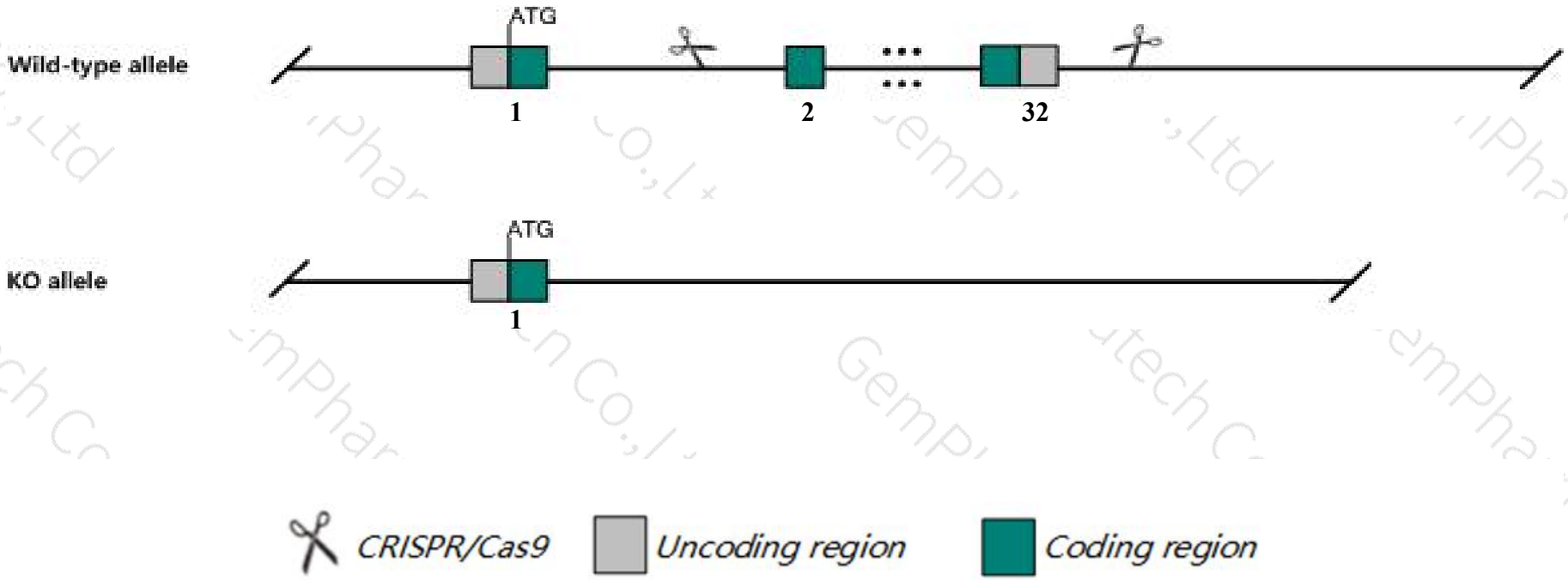
Design Date: 2020-1-19

Project Overview

Project Name	***Myo1c***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Myo1c* gene. The schematic diagram is as follows:



Technical routes

➢ The *Myo1c* gene has 10 transcripts. According to the structure of *Myo1c* gene, exon2-exon32 of *Myo1c-204* (ENSMUST00000108431.2) transcript is recommended as the knockout region.The region contains most 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 *Myo1c* gene. The brief process is as follows: CRISPR/Cas9 system

Notice

- According to the existing MGI data,Mice homozygous for a knock-in (Y61G) mutation that sensitizes to N6-modified ADP analogs display altered fast adaption in vestibular hair cells. Mice homozygous for a nuclear isoform-specifc knock-out allele exhibit minor changes in bone marrow density and red blood cells.

- The *Myo1c* gene is located on the Chr11. 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 the gene knockout on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

Gene information（NCBI）

集萃药康 GemPharmatech

Myo1c myosin IC [Mus musculus (house mouse)]

Gene ID: 17913, updated on 3-Feb-2019

Summary

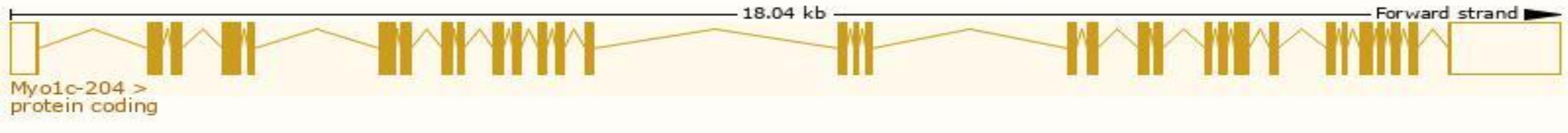
Official Symbol	Myo1c provided by MGI
Official Full Name	myosin IC provided by MGI
Primary source	MGI:MGI:106612
See related	Ensembl:ENSMUSG00000017774
Gene type	protein coding
RefSeq status	REVIEWED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	C80397, MMIb, MYO1E, NMI, mm1beta, myr2
Summary	This gene encodes a member of the unconventional myosin protein family, which are actin-based molecular motors. The protein is found in the cytoplasm, and one isoform with a unique N-terminus is also found in the nucleus. The protein functions in intracellular vesicle transport to the plasma membrane. The nuclear isoform associates with RNA polymerase I and II and functions in transcription initiation. Multiple transcript variants encoding different isoforms have been found for this gene. [provided by RefSeq, Jul 2008]
Expression	Ubiquitous expression in lung adult (RPKM 70.4), subcutaneous fat pad adult (RPKM 51.1) and 24 other tissuesSee more
Orthologs	human all

Transcript information（Ensembl）

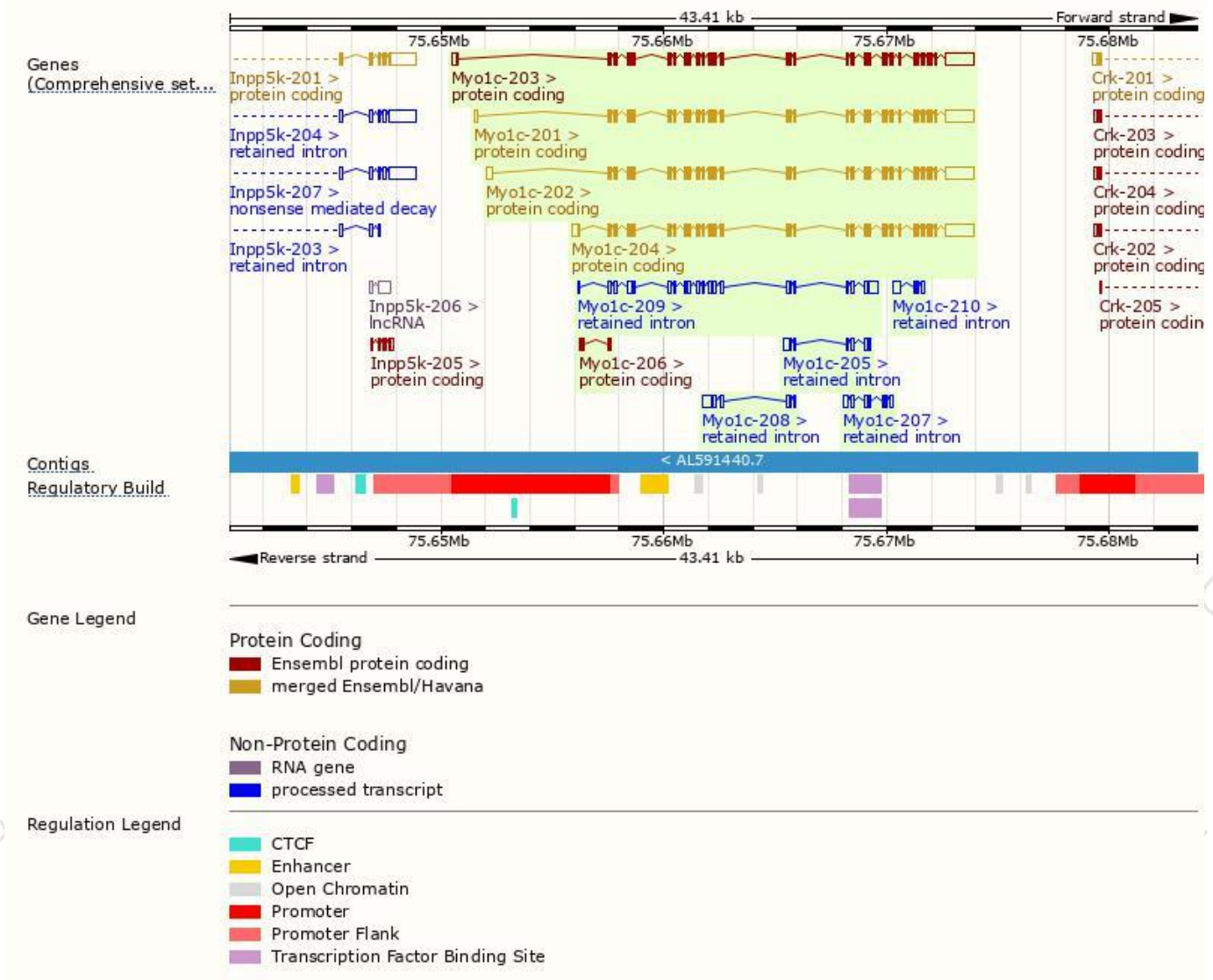
The gene has 10 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Myo1c-204	ENSMUST00000108431.2	4718	1044aa	Protein coding	CCDS36228	Q9WTI7	TSL:1 GENCODE basic APPRIS ALT1
Myo1c-202	ENSMUST00000102504.9	4659	1028aa	Protein coding	CCDS25054	Q9WTI7	TSL:1 GENCODE basic APPRIS P3
Myo1c-201	ENSMUST00000069057.12	4547	1028aa	Protein coding	CCDS25054	Q9WTI7	TSL:1 GENCODE basic APPRIS P3
Myo1c-203	ENSMUST00000102505.9	4652	1063aa	Protein coding	-	Q9WTI7	TSL:5 GENCODE basic APPRIS ALT1
Myo1c-206	ENSMUST00000136935.1	351	80aa	Protein coding	-	Q5ND45	CDS 3' incomplete TSL:2
Myo1c-209	ENSMUST00000151174.7	2503	No protein	Retained intron	-	-	TSL:1
Myo1c-208	ENSMUST00000148659.7	783	No protein	Retained intron	-	-	TSL:5
Myo1c-207	ENSMUST00000146419.1	780	No protein	Retained intron	-	-	TSL:3
Myo1c-205	ENSMUST00000123064.7	732	No protein	Retained intron	-	-	TSL:5
Myo1c-210	ENSMUST00000155027.1	642	No protein	Retained intron	-	-	TSL:3

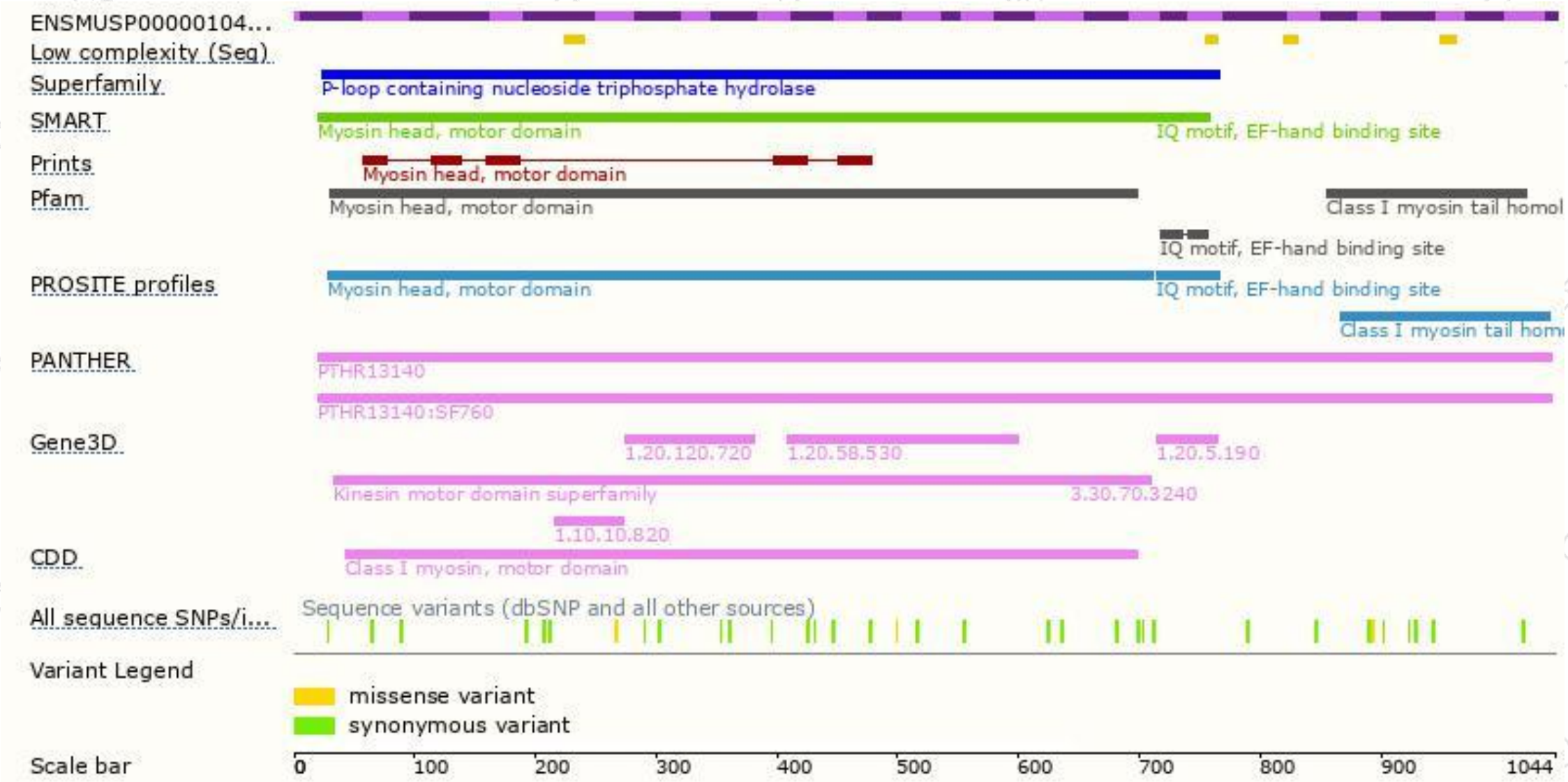
The strategy is based on the design of *Myo1c-204* transcript,The transcription is shown below



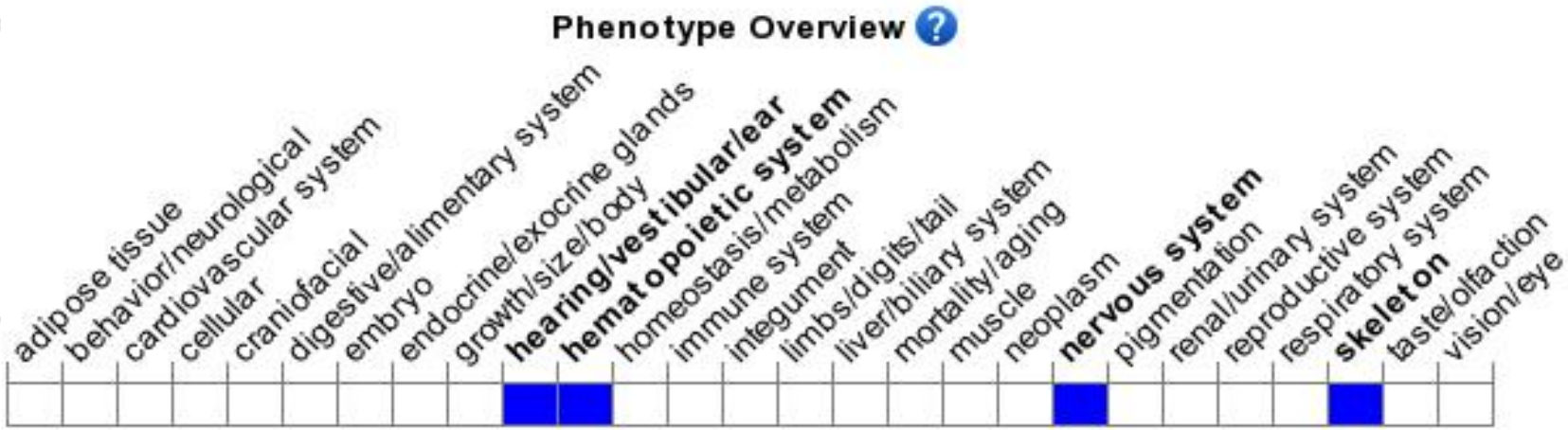
Genomic location distribution



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-in (Y61G) mutation that sensitizes to N6-modified ADP analogs display altered fast adaption in vestibular hair cells. Mice homozygous for a nuclear isoform-specifc knock-out allele exhibit minor changes in bone marrow density and red blood cells.

集萃药康
GemPharmatech

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

Tel: 400-9660890

集萃药康生物科技
GemPharmatech Co.,Ltd