

Mc4r Cas9-CKO Strategy

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Project Overview

Project Name

Mc4r

Project type

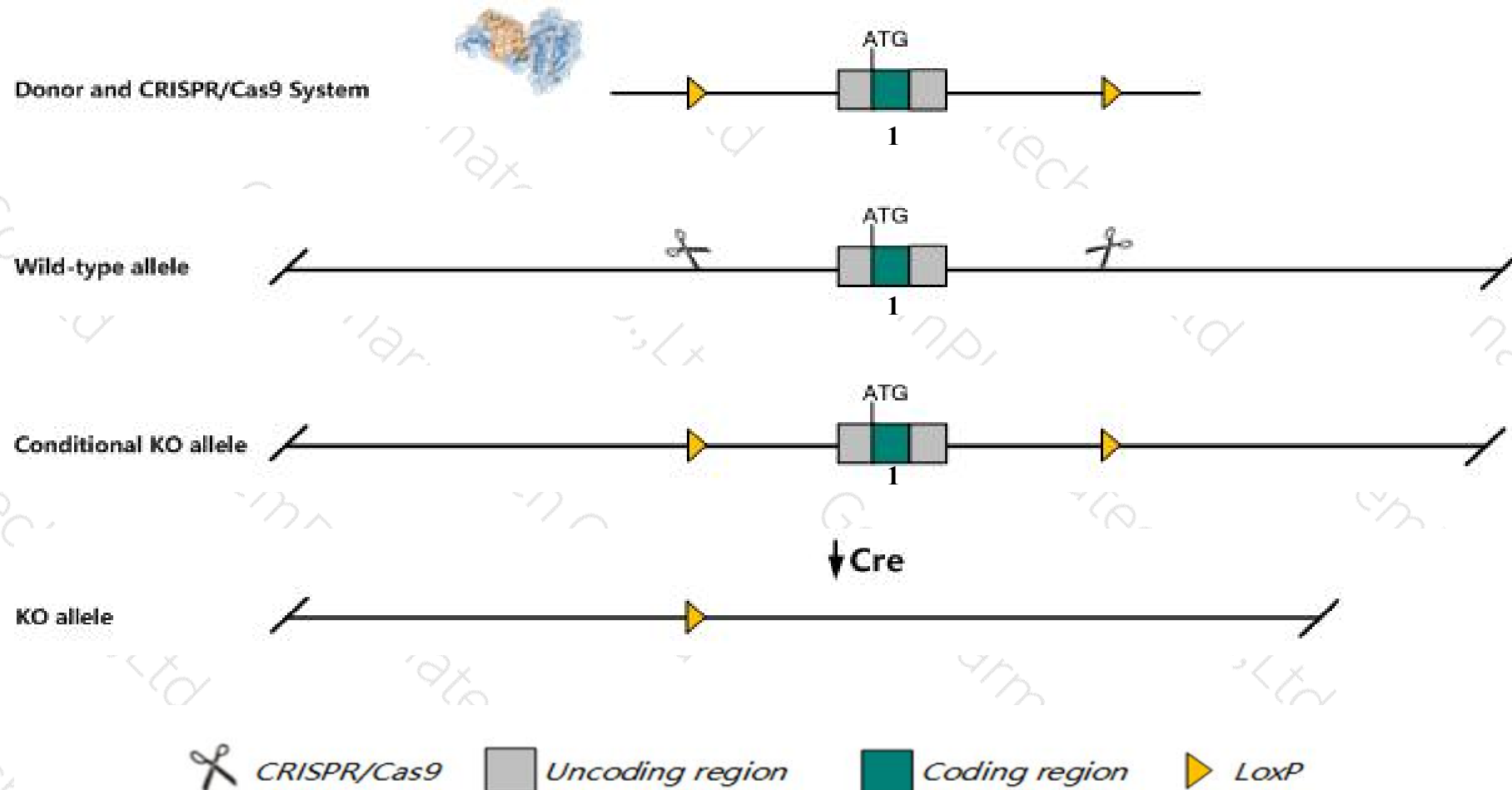
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Mc4r* gene. The schematic diagram is as follows:



Technical routes

- The *Mc4r* gene has 1 transcript. According to the structure of *Mc4r* gene, exon1 of *Mc4r-201* (ENSMUST00000057942.3) 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 *Mc4r* 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, Mutations in this gene result in hyperglycemia and weight gain.
- The *Mc4r* gene is located on the Chr18. 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)

Mc4r melanocortin 4 receptor [Mus musculus (house mouse)]

Gene ID: 17202, updated on 9-Apr-2019

Summary



Official Symbol Mc4r provided by [MGI](#)

Official Full Name melanocortin 4 receptor provided by [MGI](#)

Primary source [MGI:MGI:99457](#)

See related [Ensembl:ENSMUSG00000047259](#)

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 Mc4-r, Pkcp

Summary This gene encodes a member of the melanocortin receptor family. Melanocortin receptors are transmembrane G-protein coupled receptors, which respond to small peptide hormones and exhibit diverse functions and tissue type localization. As part of the central nervous melanocortin system, the encoded protein is competitively bound by either melanocyte stimulating hormone or agouti-related protein to regulate energy homeostasis. Disruption of this gene promotes hyperphagia and obesity, and is associated with increased cholesterol levels and insulin resistance. [provided by RefSeq, Dec 2012]

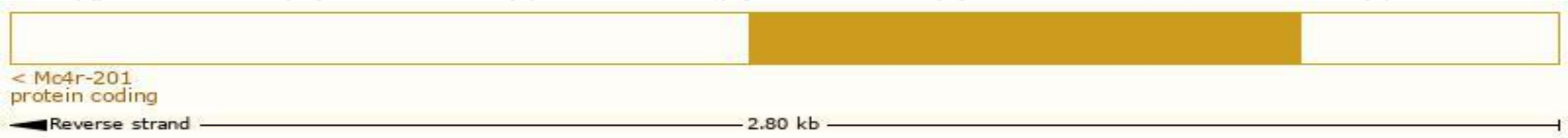
Orthologs [human](#) [all](#)

Transcript information (Ensembl)

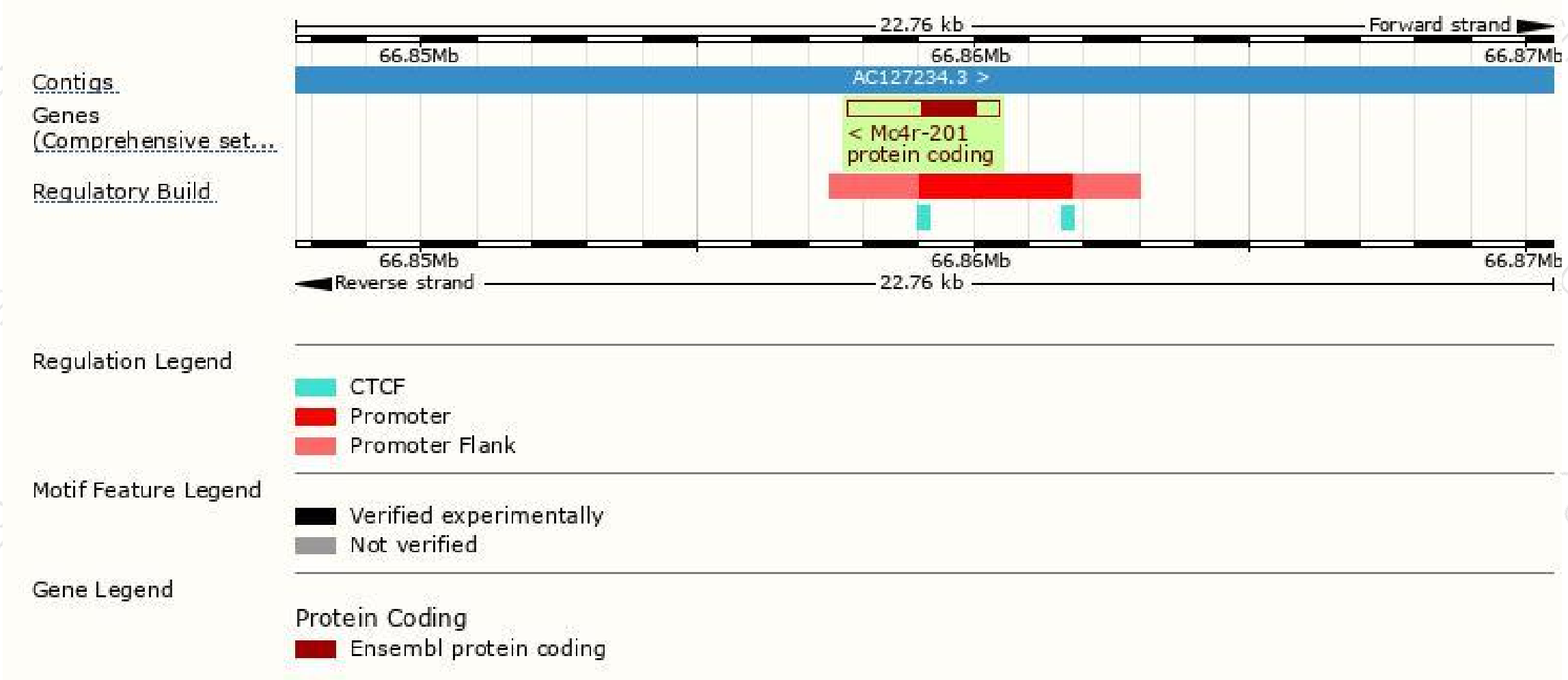
The gene has 1 transcript,and the transcript is shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Mc4r-201	ENSMUST00000057942.3	2803	332aa	Protein coding	CCDS29316	P56450	TSL:NA GENCODE basic APPRIS P1

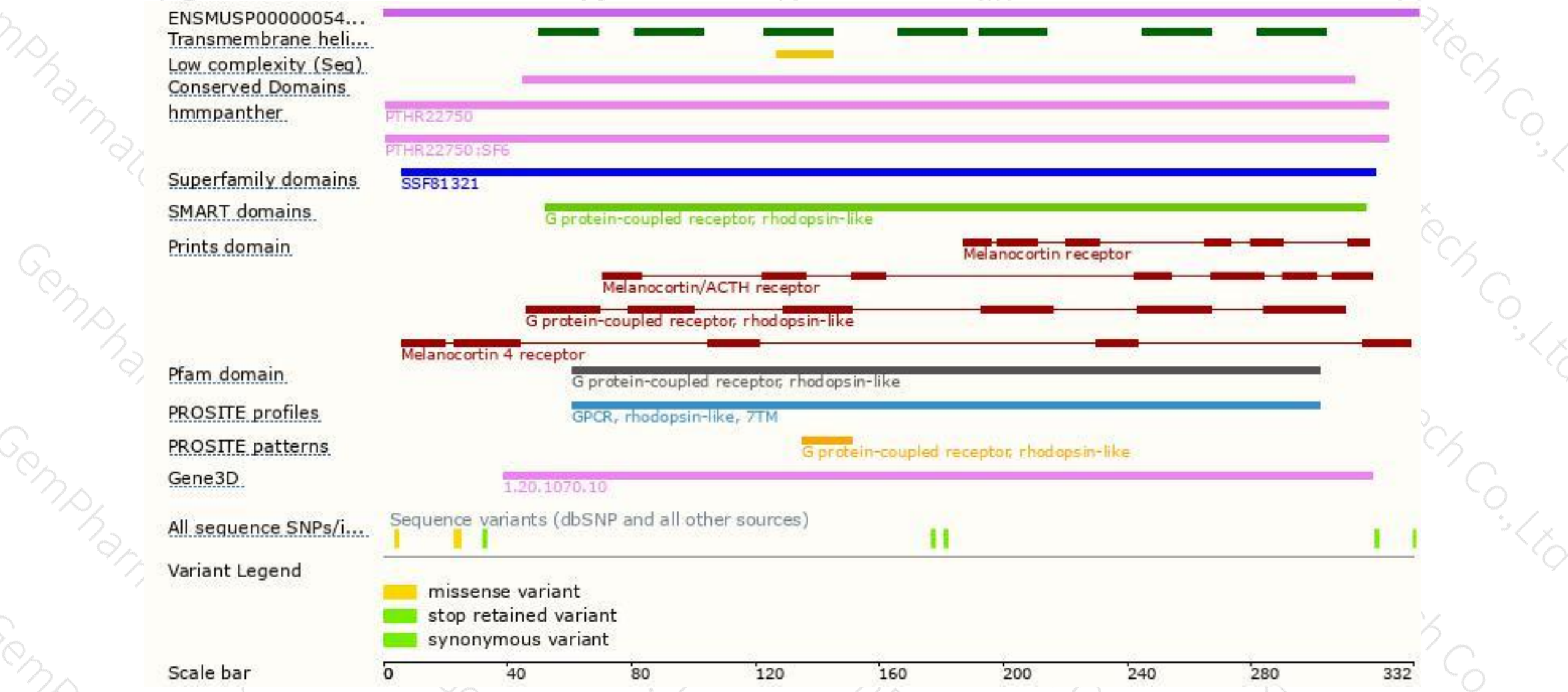
The strategy is based on the design of *Mc4r-201* transcript,The transcription is shown below



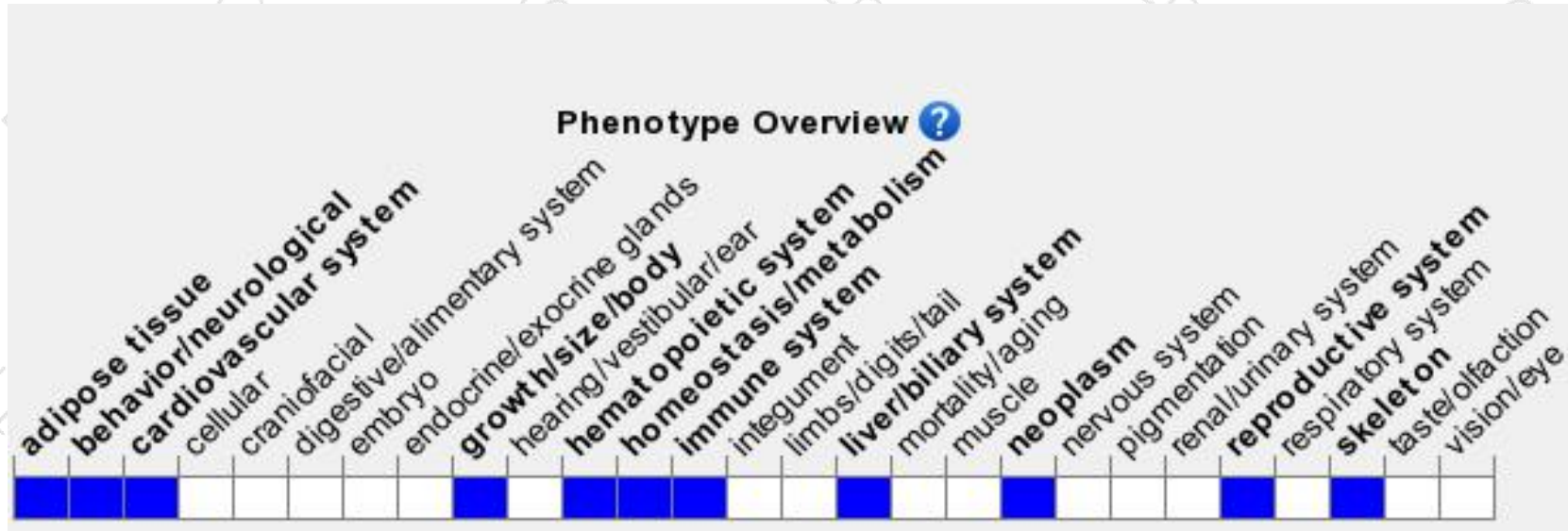
Genomic location distribution



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, Mutations in this gene result in hyperglycemia and weight gain.

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

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