

Grasp Cas9-CKO Strategy

Designer:

Ruirui Zhang

Reviewer:

Huimin Su

Design Date:

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Project Overview

Project Name

Grasp

Project type

Cas9-CKO

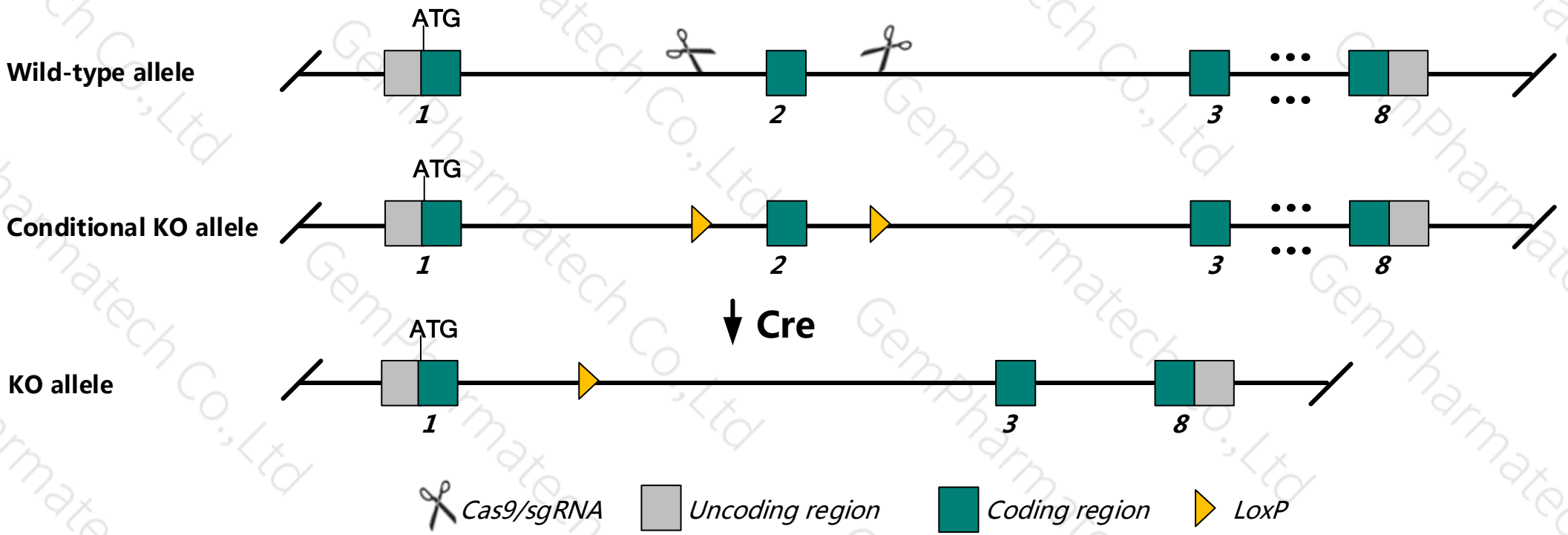
Strain background

C57BL/6JGpt

Conditional Knockout strategy

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

Donor and CRISPR/Cas9 System



- The *Grasp* gene has 1 transcript. According to the structure of *Grasp* gene, exon2 of *Grasp*-201 (ENSMUST00000000543.5) transcript is recommended as the knockout region. The region contains 50bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Grasp* gene. The brief process is as follows: sgRNA was transcribed in vitro, donor vector was constructed. Cas9, sgRNA 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 was knocked out after mating with mice expressing Cre recombinase, resulting in the loss of function of the target gene in specific tissues or cell types.

- According to the existing MGI data , mice homozygous for targeted null mutations develop and behave normally under ordinary conditions but display a marked reduction in sensitivity to acute morphine responses and impaired adaptive responses to morphine and cocaine.
- The KO region contains regulation functional region of the *A330009N23Rik* gene. Knockout the region may affect the function of *A330009N23Rik* gene.
- The *Grasp* gene is located on the Chr15. 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

Gene information (NCBI)

Grasp GRP1 (general receptor for phosphoinositides 1)-associated scaffold protein [*Mus musculus* (house mouse)]

Gene ID: 56149, updated on 12-Aug-2019

Summary

Official Symbol Grasp provided by [MGI](#)

Official Full Name GRP1 (general receptor for phosphoinositides 1)-associated scaffold protein provided by [MGI](#)

Primary source [MGI:MGI:1860303](#)

See related [Ensembl:ENSMUSG00000000531](#)

Gene type protein coding

RefSeq status VALIDATED

Organism [Mus musculus](#)

Lineage Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus

Also known as tamalin

Expression Broad expression in adrenal adult (RPKM 19.3), ovary adult (RPKM 17.4) and 22 other tissues [See more](#)

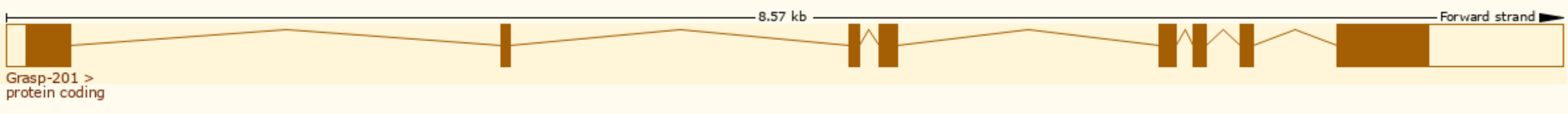
Orthologs [human](#) [all](#)

Transcript information (Ensembl)

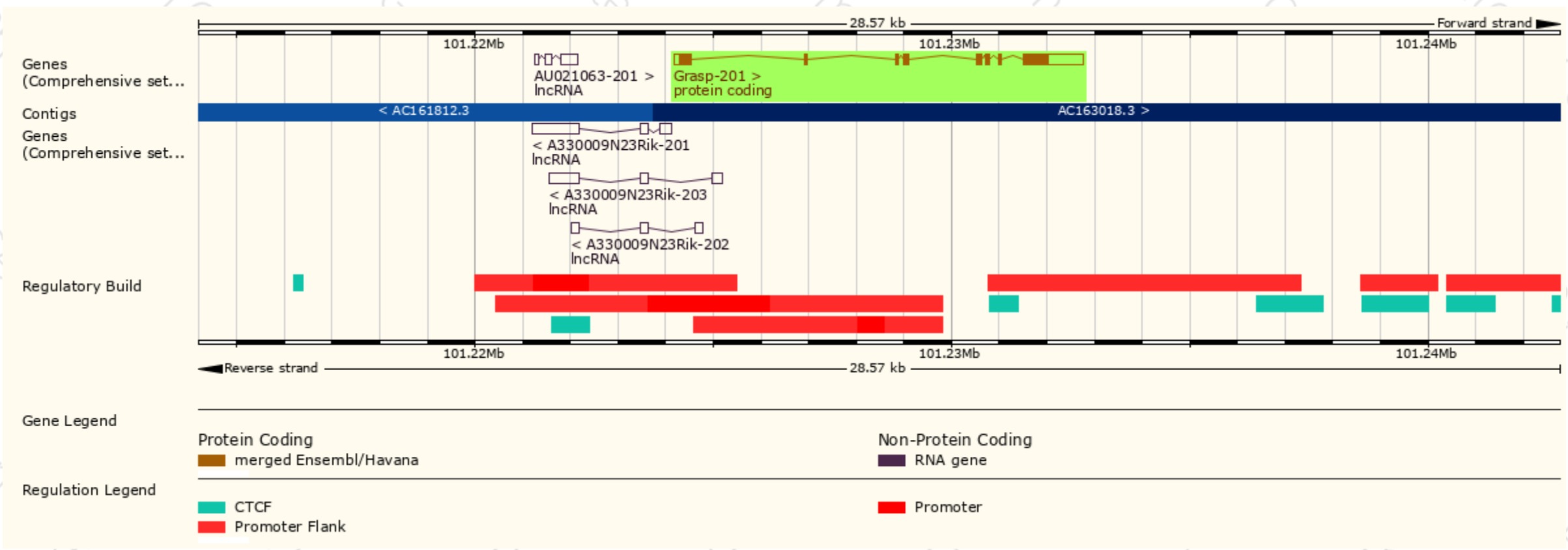
The gene has 1 transcript, and all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Grasp-201	ENSMUST00000000543.5	2033	392aa	Protein coding	CCDS27847	Q9JJA9	TSL:1 GENCODE basic APPRIS P1

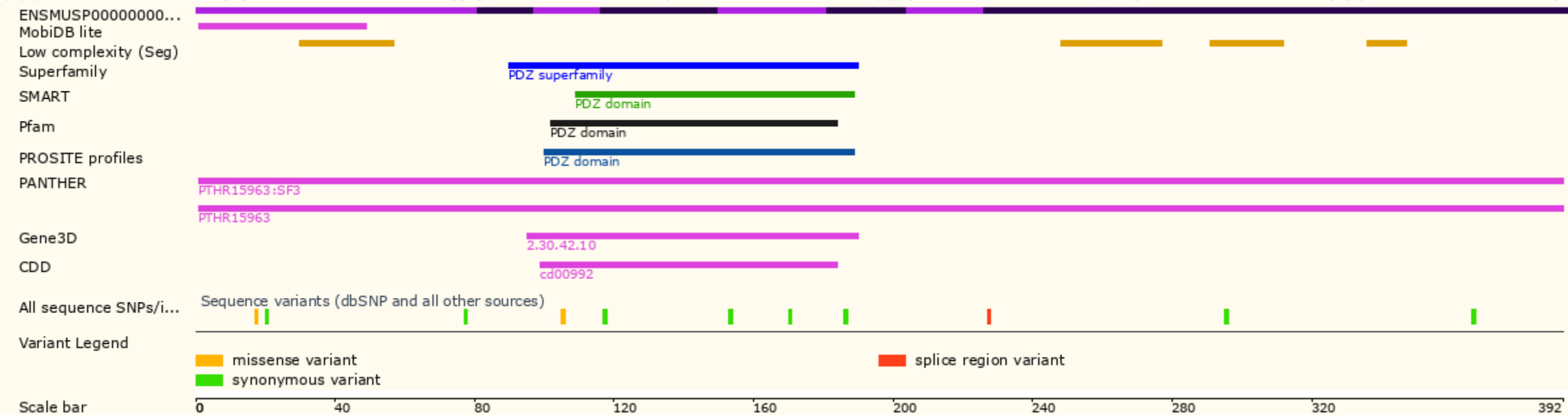
The strategy is based on the design of *Grasp-201* transcript, the transcription is shown below:



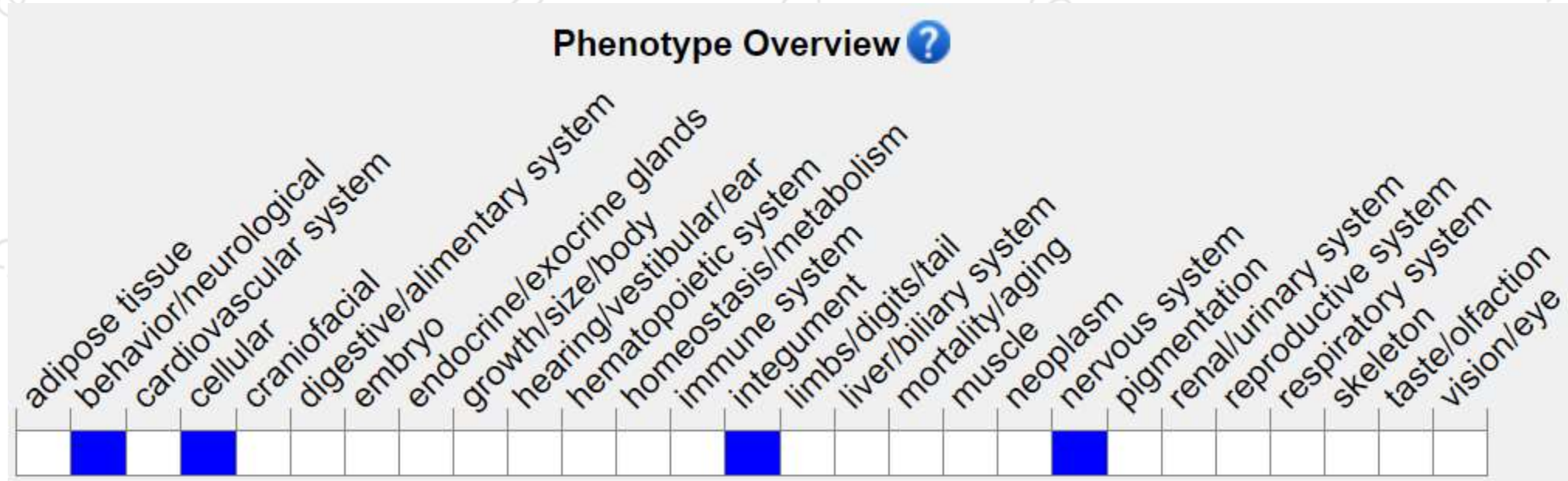
Genomic location distribution



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 , mice homozygous for targeted null mutations develop and behave normally under ordinary conditions but display a marked reduction in sensitivity to acute morphine responses and impaired adaptive responses to morphine and cocaine.

If you have any questions, you are welcome to inquire.
Tel: 025-5864 1534

