Kcng2 Cas9-CKO Strategy

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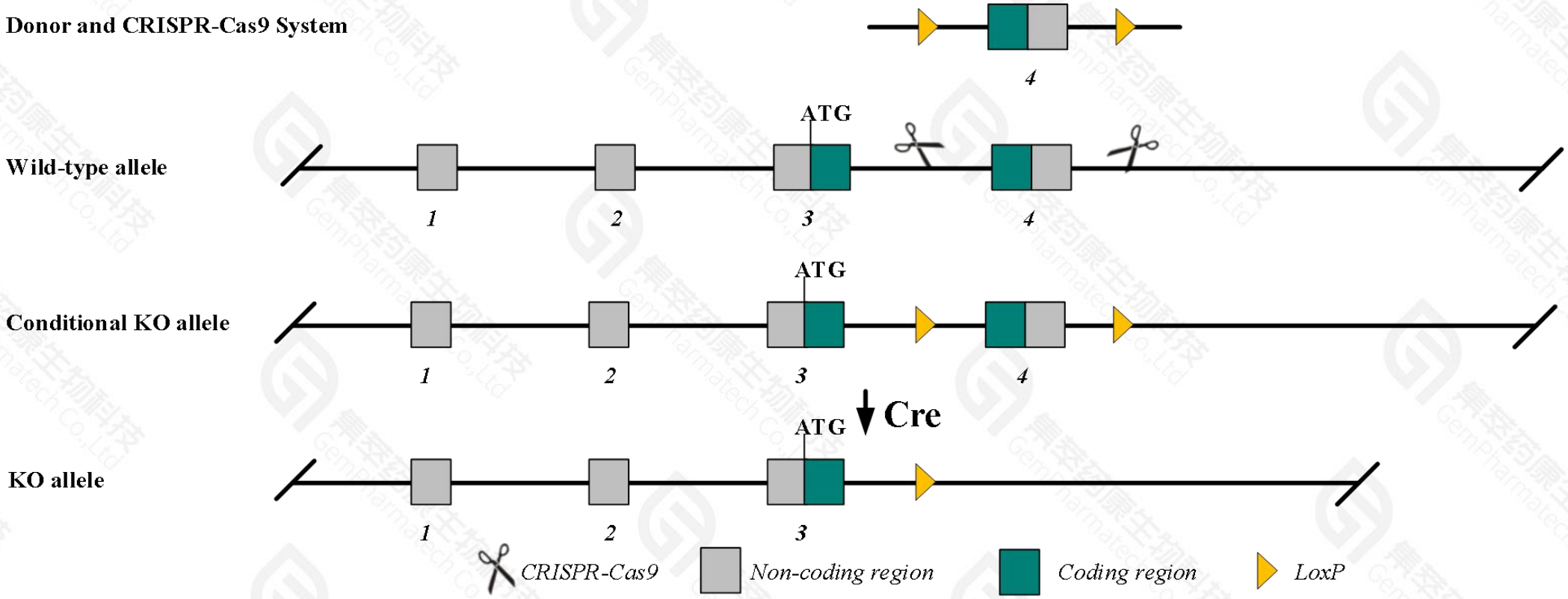
Design Date: 2022-8-15

Project Overview

Project Name	***Kcng2***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR-Cas9 technology to edit the *Kcng2* gene. The schematic diagram is as follows:



Technical routes

➢ The *Kcng2* gene has 3 transcripts. According to the structure of *Kcng2* gene, exon4 of *Kcng2-201*(ENSMUST00000077962.8) transcript is recommended as the knockout region.The region contains part 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 *Kcng2* 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.

Notice

➢ The KO region is close to *Slc66a2* gene.Knockout the region may affect the function of *Slc66a2* gene.

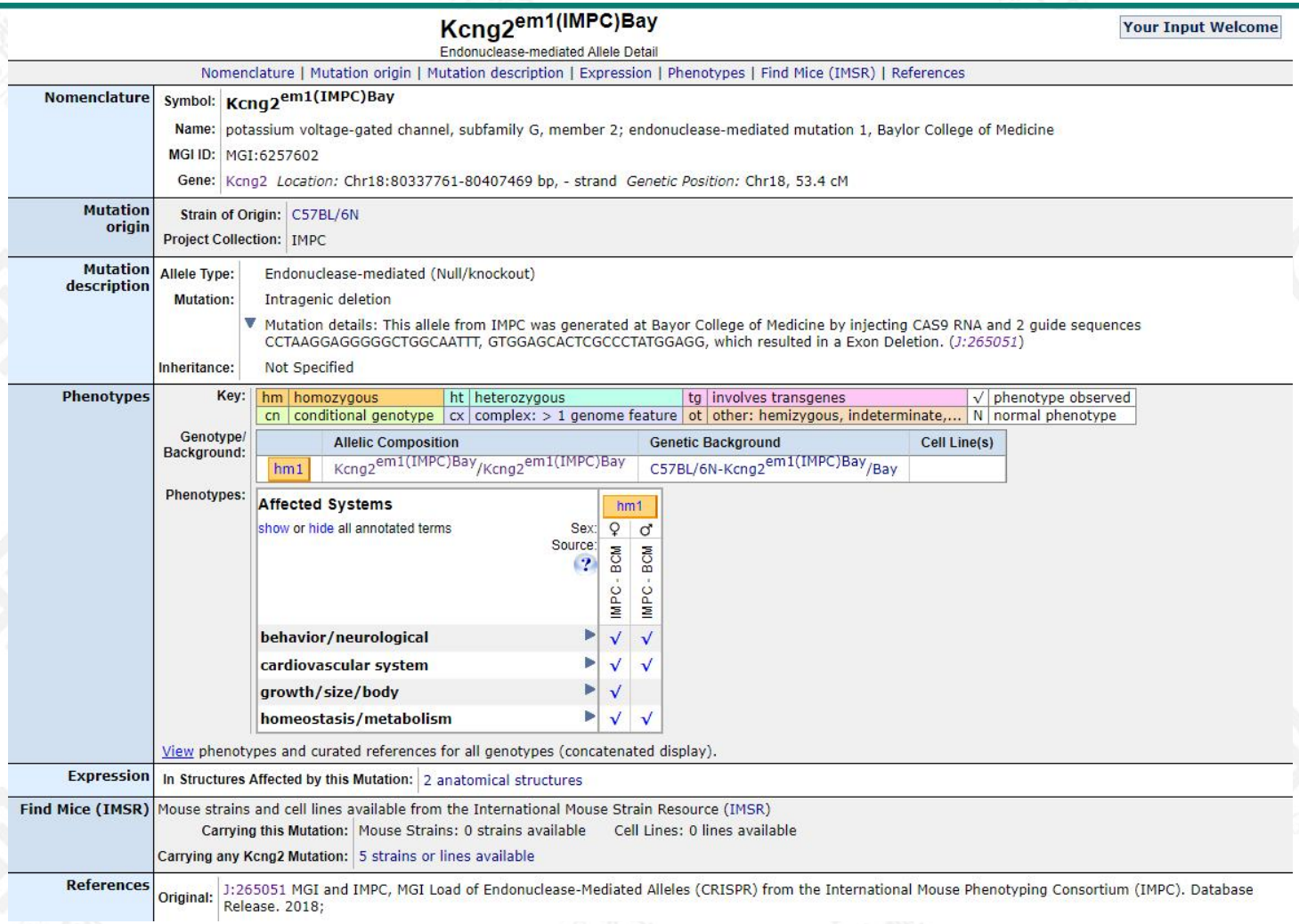
➢ The effect of *Kcng2-202* and *Kcng2-203* is unknown.

➢ The N-terminal of *Kcng2* gene will remain several amino acids, it may remain the partial function of *Kcng2* gene.

➢ The *Kcng2* 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.

Existing model information(MGI)



Kcng2$^{em1(IMPC)Bay}$

Endonuclease-mediated Allele Detail

Your Input Welcome

Nomenclature | Mutation origin | Mutation description | Expression | Phenotypes | Find Mice (IMSR) | References

Nomenclature

Symbol: Kcng2$^{em1(IMPC)Bay}$

Name: potassium voltage-gated channel, subfamily G, member 2; endonuclease-mediated mutation 1, Baylor College of Medicine

MGI ID: MGI:6257602

Gene: Kcng2 *Location:* Chr18:80337761-80407469 bp, - strand *Genetic Position:* Chr18, 53.4 cM

Mutation origin

Strain of Origin: C57BL/6N

Project Collection: IMPC

Mutation description

Allele Type: Endonuclease-mediated (Null/knockout)

Mutation: Intragenic deletion

Mutation details: This allele from IMPC was generated at Bayor College of Medicine by injecting CAS9 RNA and 2 guide sequences CCTAAGGAGGGGGCTGGCAATTT, GTGGAGCACTCGCCCTATGGAGG, which resulted in a Exon Deletion. (*J:265051*)

Inheritance: Not Specified

Phenotypes

Key:

hm	homozygous	ht	heterozygous	tg	involves transgenes	√	phenotype observed
cn	conditional genotype	cx	complex: > 1 genome feature	ot	other: hemizygous, indeterminate,...	N	normal phenotype

Genotype/ Background:

	Allelic Composition	Genetic Background	Cell Line(s)
hm1	Kcng2$^{em1(IMPC)Bay}$/Kcng2$^{em1(IMPC)Bay}$	C57BL/6N-Kcng2$^{em1(IMPC)Bay}$/Bay	

Phenotypes:

Affected Systems (show or hide all annotated terms)	hm1 ♀ IMPC - BCM	hm1 ♂ IMPC - BCM
behavior/neurological	√	√
cardiovascular system	√	√
growth/size/body	√	
homeostasis/metabolism	√	√

View phenotypes and curated references for all genotypes (concatenated display).

Expression

In Structures Affected by this Mutation: 2 anatomical structures

Find Mice (IMSR)

Mouse strains and cell lines available from the International Mouse Strain Resource (IMSR)

Carrying this Mutation: Mouse Strains: 0 strains available Cell Lines: 0 lines available

Carrying any Kcng2 Mutation: 5 strains or lines available

References

Original: J:265051 MGI and IMPC, MGI Load of Endonuclease-Mediated Alleles (CRISPR) from the International Mouse Phenotyping Consortium (IMPC). Database Release. 2018;

http://www.informatics.jax.org/allele/MGI:6257602

Gene information（NCBI）

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Kcng2 potassium voltage-gated channel, subfamily G, member 2 [*Mus musculus* (house mouse)]

Download Datasets

Gene ID: 240444, updated on 13-Aug-2022

Summary

Official Symbol	Kcng2 provided by MGI
Official Full Name	potassium voltage-gated channel, subfamily G, member 2 provided by MGI
Primary source	MGI:MGI:3694646
See related	Ensembl:ENSMUSG00000059852 AllianceGenome:MGI:3694646
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
Summary	Predicted to enable voltage-gated potassium channel activity. Predicted to be involved in potassium ion transmembrane transport. Predicted to be part of voltage-gated potassium channel complex. Predicted to be integral component of membrane. Orthologous to human KCNG2 (potassium voltage-gated channel modifier subfamily G member 2). [provided by Alliance of Genome Resources, Apr 2022]
Expression	Biased expression in heart adult (RPKM 41.8) and thymus adult (RPKM 2.3) See more
Orthologs	human all

NEW Try the new Gene table

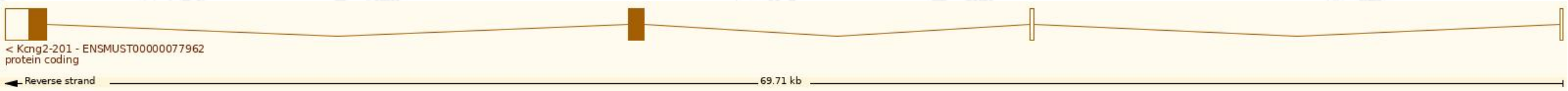
Try the new Transcript table

Transcript information（Ensembl）

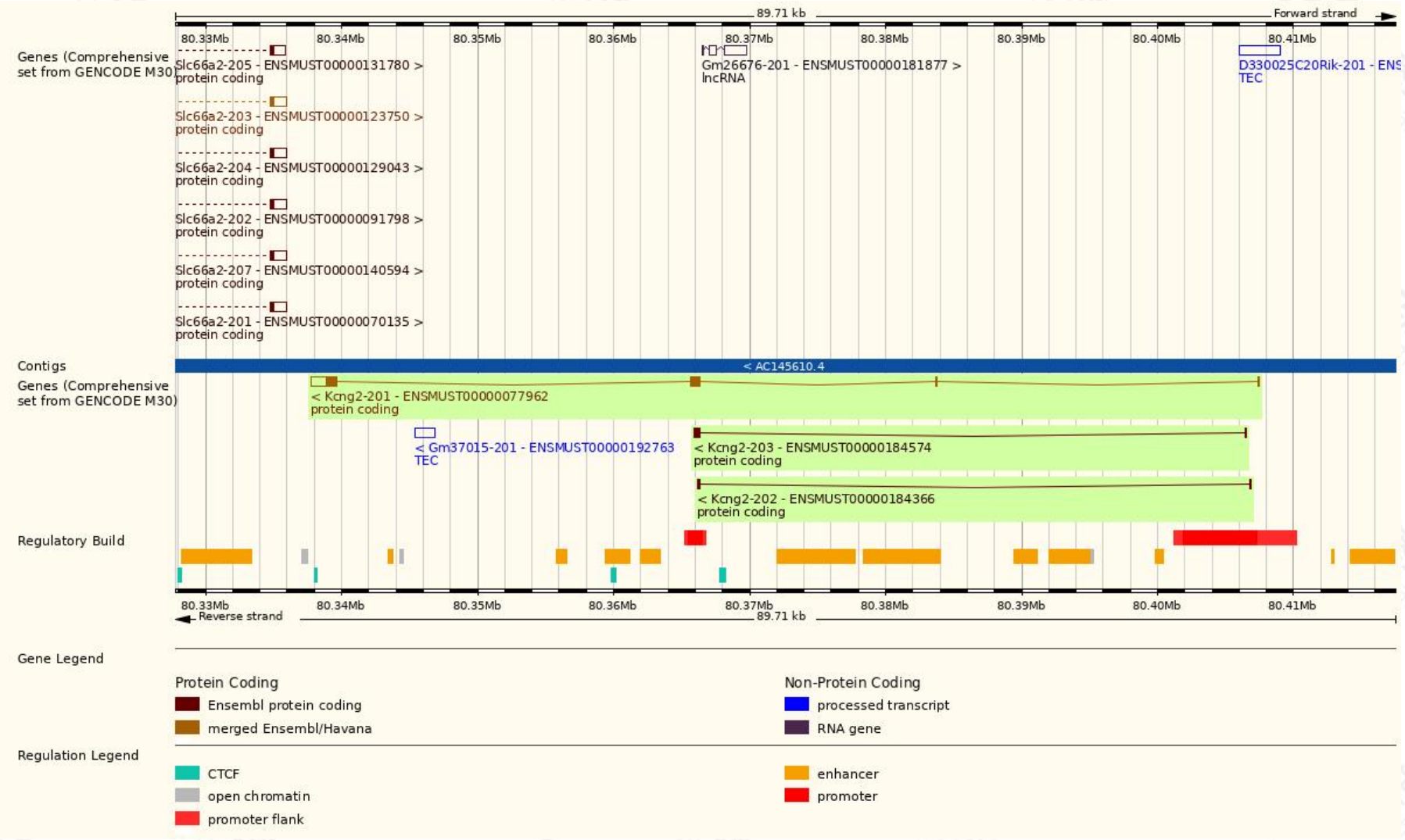
The gene has 3 transcripts,and the transcript is shown below:

Transcript ID	Name	bp	Protein	Biotype	CCDS	UniProt Match	Flags
ENSMUST00000077962.8	Kcng2-201	2813	480aa	Protein coding	CCDS57127	F7A6P6	Ensembl Canonical GENCODE basic APPRIS P1 TSL:5
ENSMUST00000184366.2	Kcng2-202	279	64aa	Protein coding		V9GX03	TSL:5 CDS 3' incomplete
ENSMUST00000184574.2	Kcng2-203	616	152aa	Protein coding		V9GXB3	TSL:3 CDS 3' incomplete

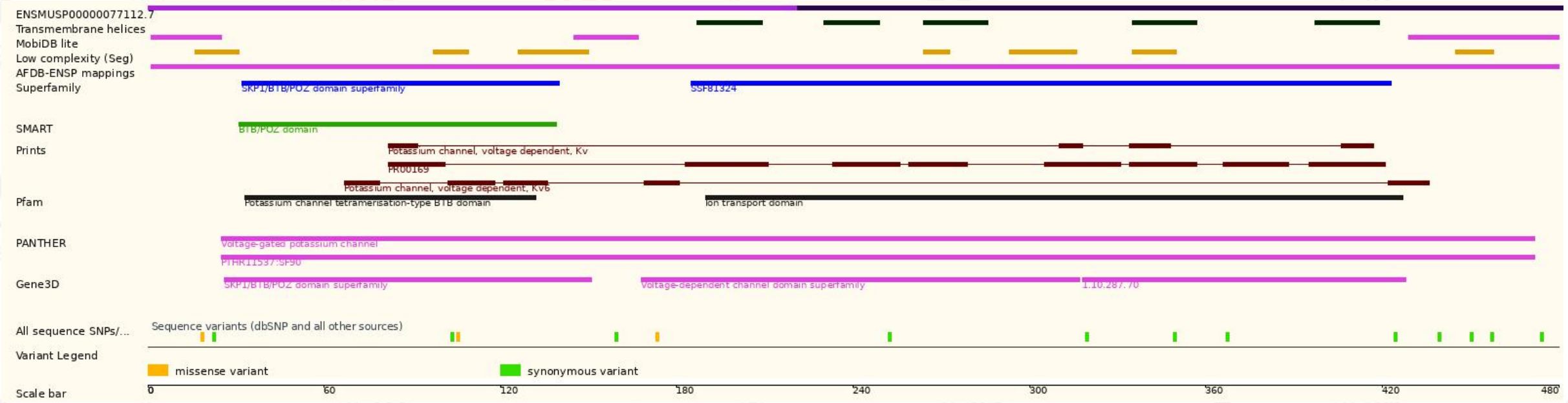
The strategy is based on the design of *Kcng2-201* transcript,the transcription is shown below:



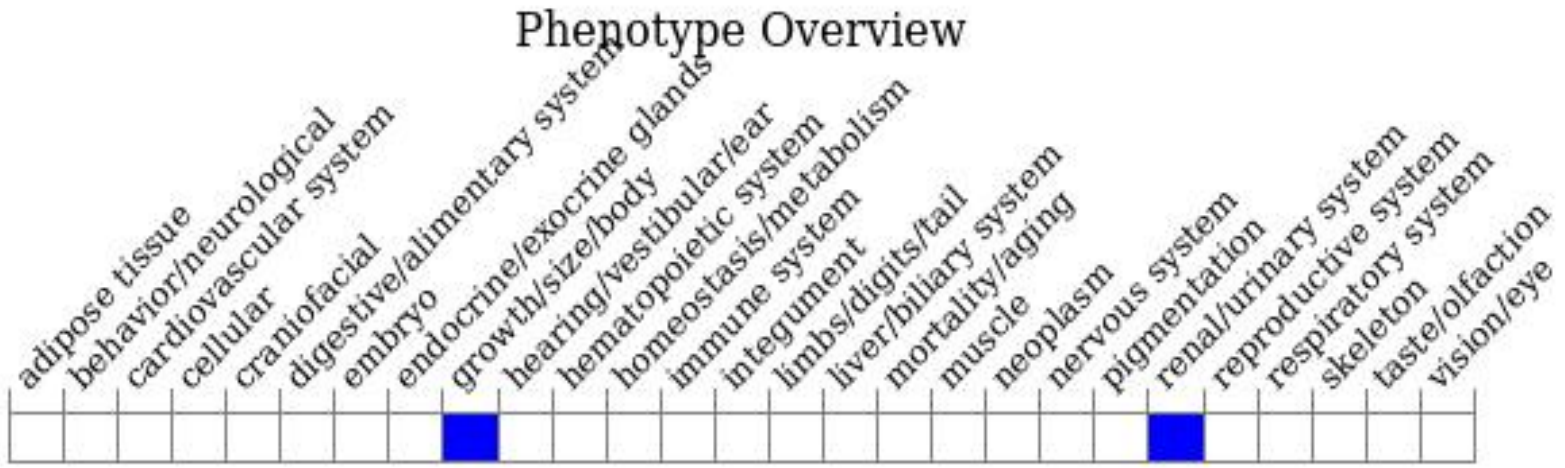
Genomic location distribution



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/).

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