Slc11a2 Cas9-KO Strategy

Designer: Huan Wang

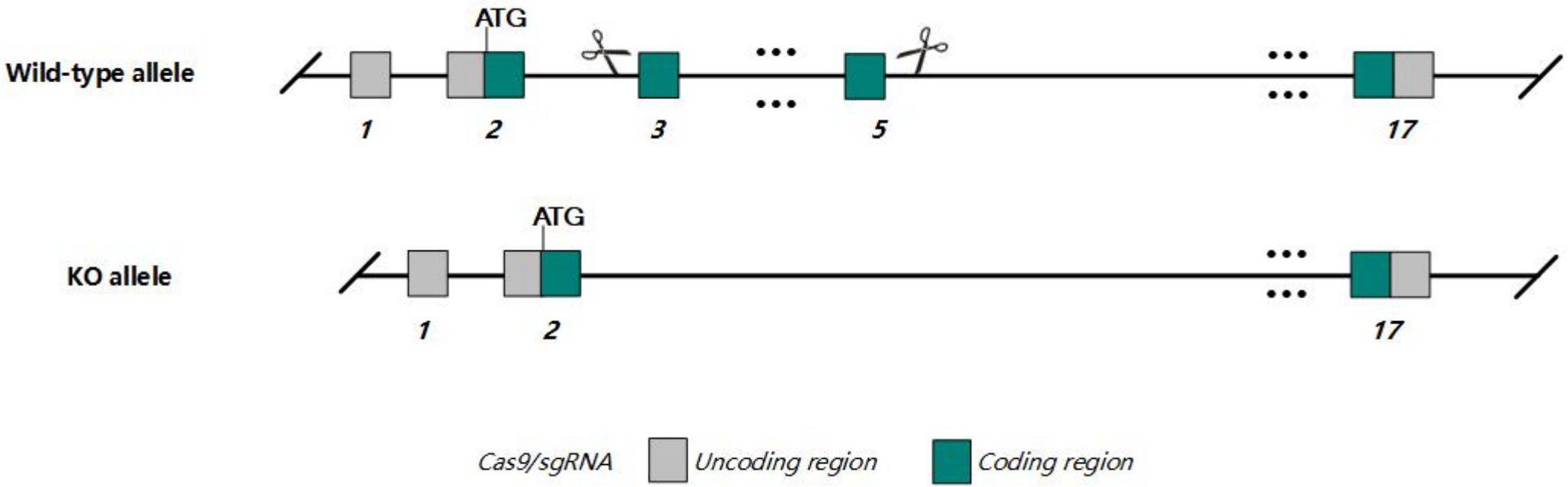
Design Date: 2019-7-25

Project Overview

Project Name	***Slc11a2***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Slc11a2* gene. The schematic diagram is as follows:



Technical routes

➢ The *Slc11a2* gene has 8 transcripts. According to the structure of *Slc11a2* gene, exon3-exon5 of *Slc11a2-201* (ENSMUST00000023774.11) transcript is recommended as the knockout region.The region contains 395bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Slc11a2* gene. The brief process is as follows: gRNA was transcribed in vitro.Cas9 and gRNA 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.

Notice

- According to the existing MGI data,Homozygotes for a spontaneous mutation exhibit microcytic, hypochromic anemia associated with impaired intestinal iron absorption and erythroblast iron uptake. Mutants have reduced viability and fertility.

- The *Slc11a2* 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 gene knockout on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

Gene information（NCBI）

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Slc11a2 solute carrier family 11 (proton-coupled divalent metal ion transporters), member 2 [Mus musculus (house mouse)]

Gene ID: 18174, updated on 2-Apr-2019

Summary

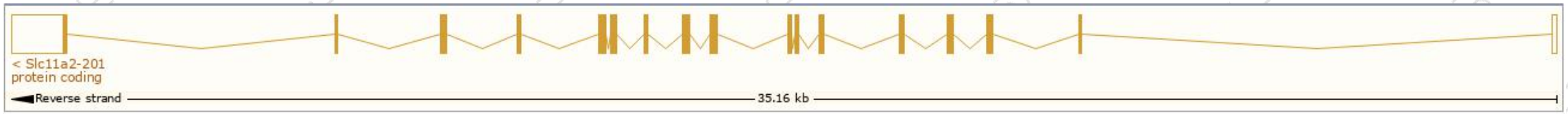
Official Symbol	Slc11a2 provided by MGI
Official Full Name	solute carrier family 11 (proton-coupled divalent metal ion transporters), member 2 provided by MGI
Primary source	MGI:MGI:1345279
See related	Ensembl:ENSMUSG00000023030
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	DCT1, DMT1, Nramp2, mk, van
Expression	Ubiquitous expression in duodenum adult (RPKM 20.4), kidney adult (RPKM 16.6) and 28 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

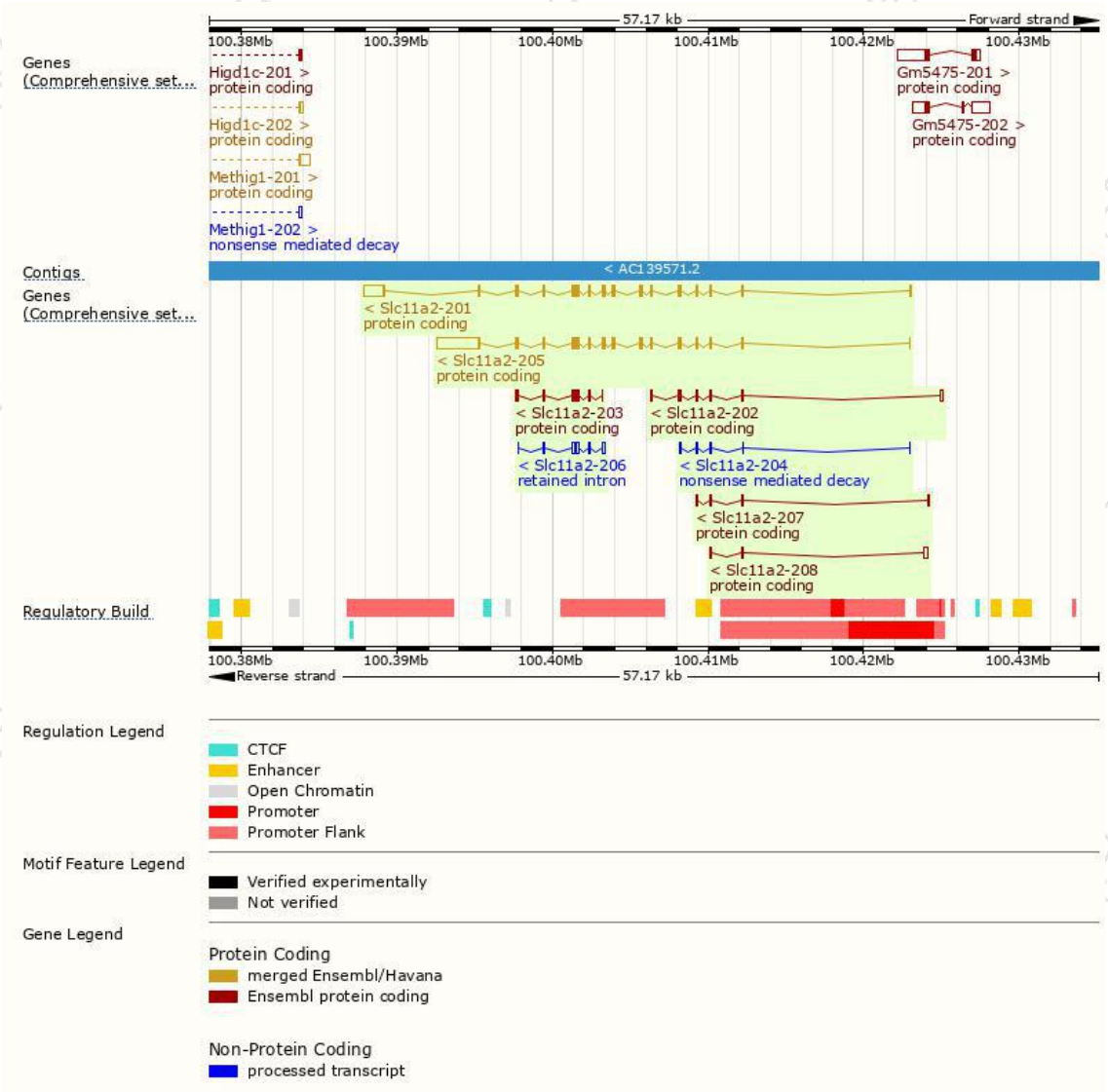
The gene has 8 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Slc11a2-205	ENSMUST00000138843.7	4415	561aa	Protein coding	CCDS49733	P49282	TSL:1 GENCODE basic APPRIS ALT2
Slc11a2-201	ENSMUST00000023774.11	3025	568aa	Protein coding	CCDS37211	P49282	TSL:1 GENCODE basic APPRIS P3
Slc11a2-203	ENSMUST00000124324.1	718	220aa	Protein coding	-	F6ZM31	CDS 5' incomplete TSL:2
Slc11a2-202	ENSMUST00000123461.7	709	170aa	Protein coding	-	D3Z314	CDS 3' incomplete TSL:3
Slc11a2-207	ENSMUST00000154331.1	389	110aa	Protein coding	-	D3Z0R6	CDS 3' incomplete TSL:1
Slc11a2-208	ENSMUST00000154676.1	387	50aa	Protein coding	-	D3YXP3	CDS 3' incomplete TSL:5
Slc11a2-204	ENSMUST00000136168.1	393	68aa	Nonsense mediated decay	-	D6RGP0	TSL:3
Slc11a2-206	ENSMUST00000140535.1	709	No protein	Retained intron	-	-	TSL:2

The strategy is based on the design of *Slc11a2-201* transcript,The transcription is shown below

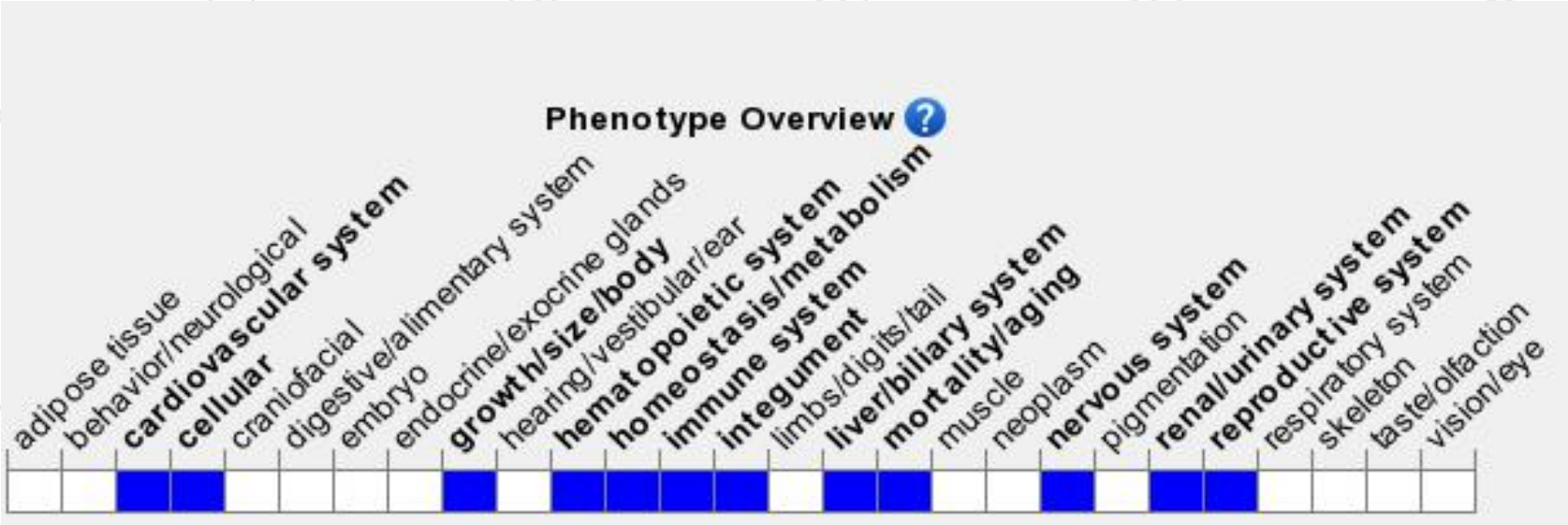


Genomic location distribution



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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