Slc10a7 Cas9-CKO Strategy

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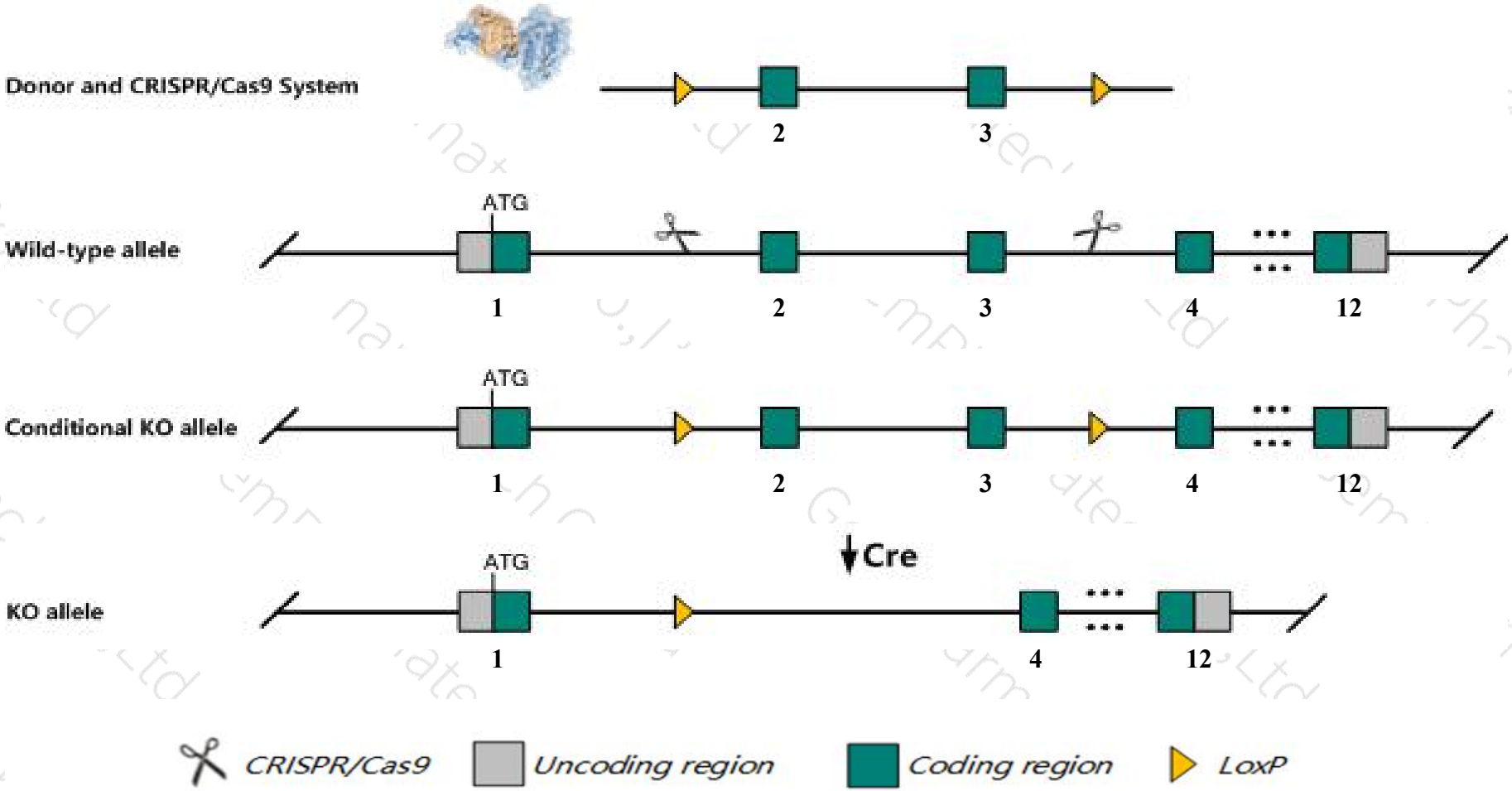
Project Overview

Project Name	***Slc10a7***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Slc10a7* gene. The schematic diagram is as follows:



Technical routes

➢ The *Slc10a7* gene has 11 transcripts. According to the structure of *Slc10a7* gene, exon2-exon3 of *Slc10a7-201*(ENSMUST00000034111.9) transcript is recommended as the knockout region.The region contains 220bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Slc10a7* 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

➢ According to the existing MGI data,mice homozygous for a knock-out allele exhibit postnatal growth retardation and skeletal dysplasia with craniofacial anomalies, shortened long bones, brachypodia, growth plate disorganization, and tooth enamel defects.

➢ The *Slc10a7* gene is located on the Chr8. 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）

Slc10a7 solute carrier family 10 (sodium/bile acid cotransporter family), member 7 [Mus musculus (house mouse)]

Gene ID: 76775, updated on 20-Mar-2020

Summary

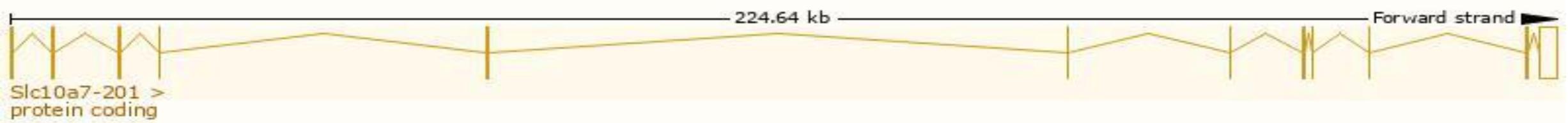
Official Symbol	Slc10a7 provided by MGI
Official Full Name	solute carrier family 10 (sodium/bile acid cotransporter family), member 7 provided by MGI
Primary source	MGI:MGI:1924025
See related	Ensembl:ENSMUSG00000031684
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	2410193C02Rik, P7
Expression	Ubiquitous expression in limb E14.5 (RPKM 4.4), genital fat pad adult (RPKM 3.0) and 28 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

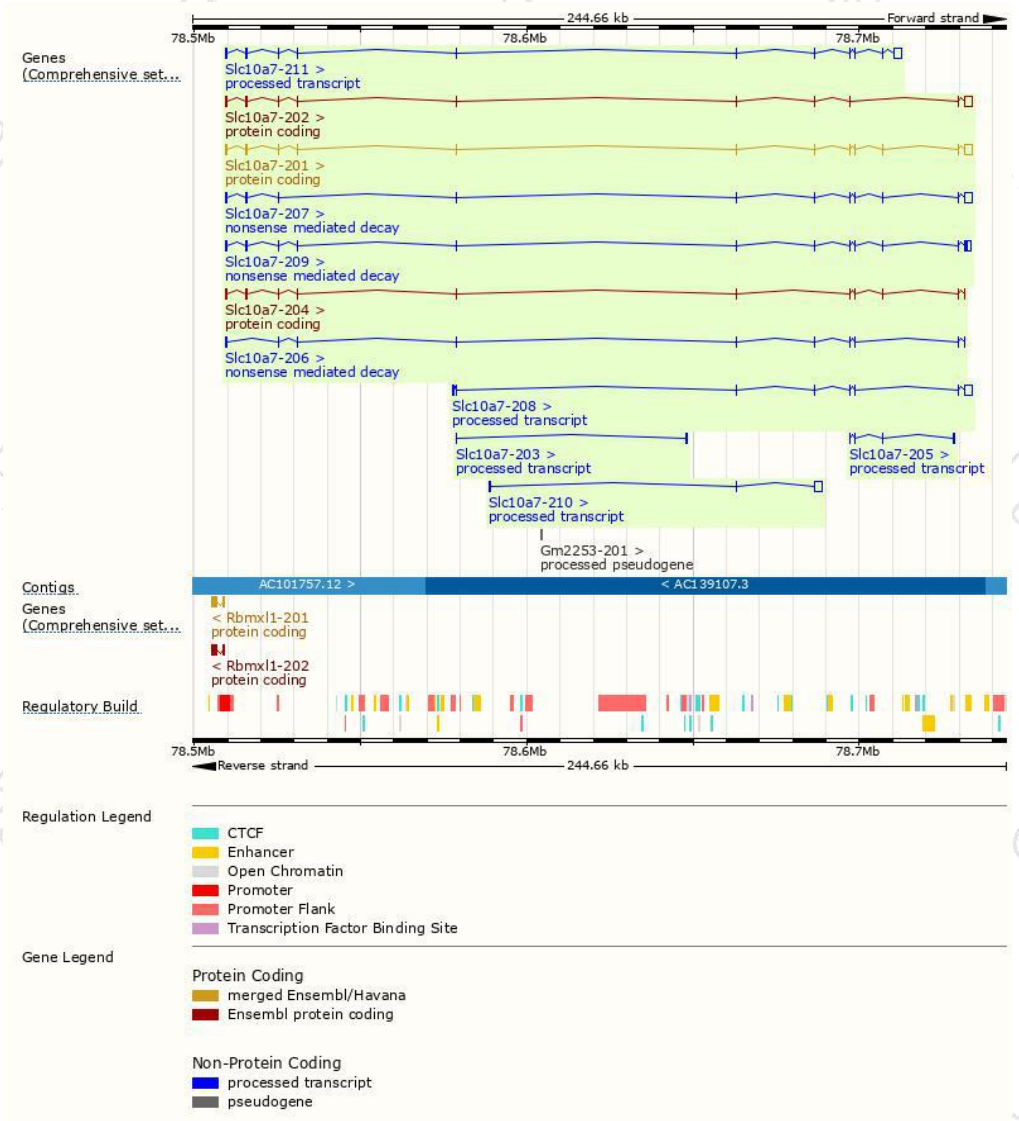
The gene has 11 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Slc10a7-201	ENSMUST00000034111.9	3595	340aa	Protein coding	CCDS40395	Q5PT53	TSL:1 GENCODE basic APPRIS P1
Slc10a7-202	ENSMUST00000209490.1	3485	298aa	Protein coding	CCDS85567	Q5PT53	TSL:1 GENCODE basic
Slc10a7-204	ENSMUST00000209992.1	939	312aa	Protein coding	CCDS85568	Q5PT53	TSL:1 GENCODE basic
Slc10a7-207	ENSMUST00000210630.1	3494	123aa	Nonsense mediated decay	-	A0A1B0GR66	TSL:1
Slc10a7-209	ENSMUST00000211286.1	2752	340aa	Nonsense mediated decay	-	Q5PT53	TSL:1
Slc10a7-206	ENSMUST00000210515.1	866	103aa	Nonsense mediated decay	-	Q5PT52	TSL:1
Slc10a7-211	ENSMUST00000211332.1	3517	No protein	Processed transcript	-	-	TSL:1
Slc10a7-208	ENSMUST00000210703.1	3315	No protein	Processed transcript	-	-	TSL:1
Slc10a7-210	ENSMUST00000211315.1	2628	No protein	Processed transcript	-	-	TSL:1
Slc10a7-205	ENSMUST00000210132.1	680	No protein	Processed transcript	-	-	TSL:5
Slc10a7-203	ENSMUST00000209643.1	121	No protein	Processed transcript	-	-	TSL:5

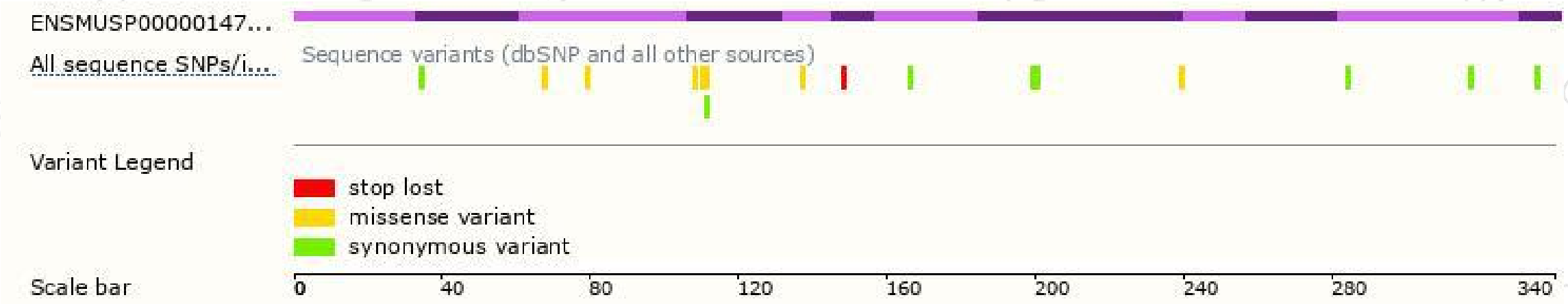
The strategy is based on the design of *Slc10a7-201* transcript,the transcription is shown below:



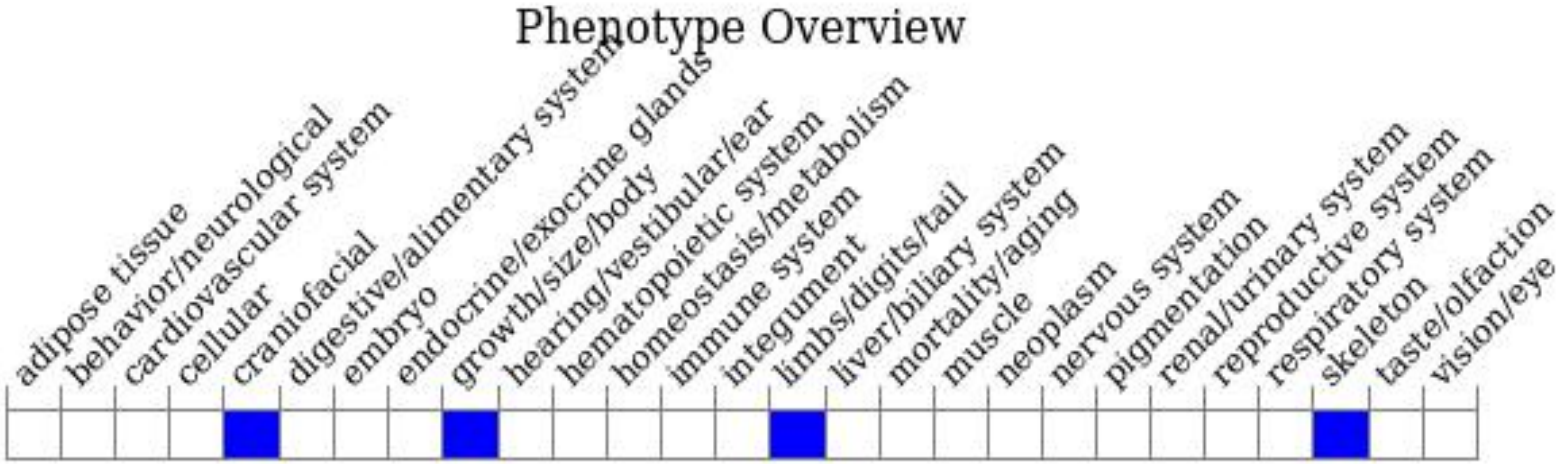
Genomic location distribution



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 a knock-out allele exhibit postnatal growth retardation and skeletal dysplasia with craniofacial anomalies, shortened long bones, brachypodia, growth plate disorganization, and tooth enamel defects.

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

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