Pax9 Cas9-KO Strategy

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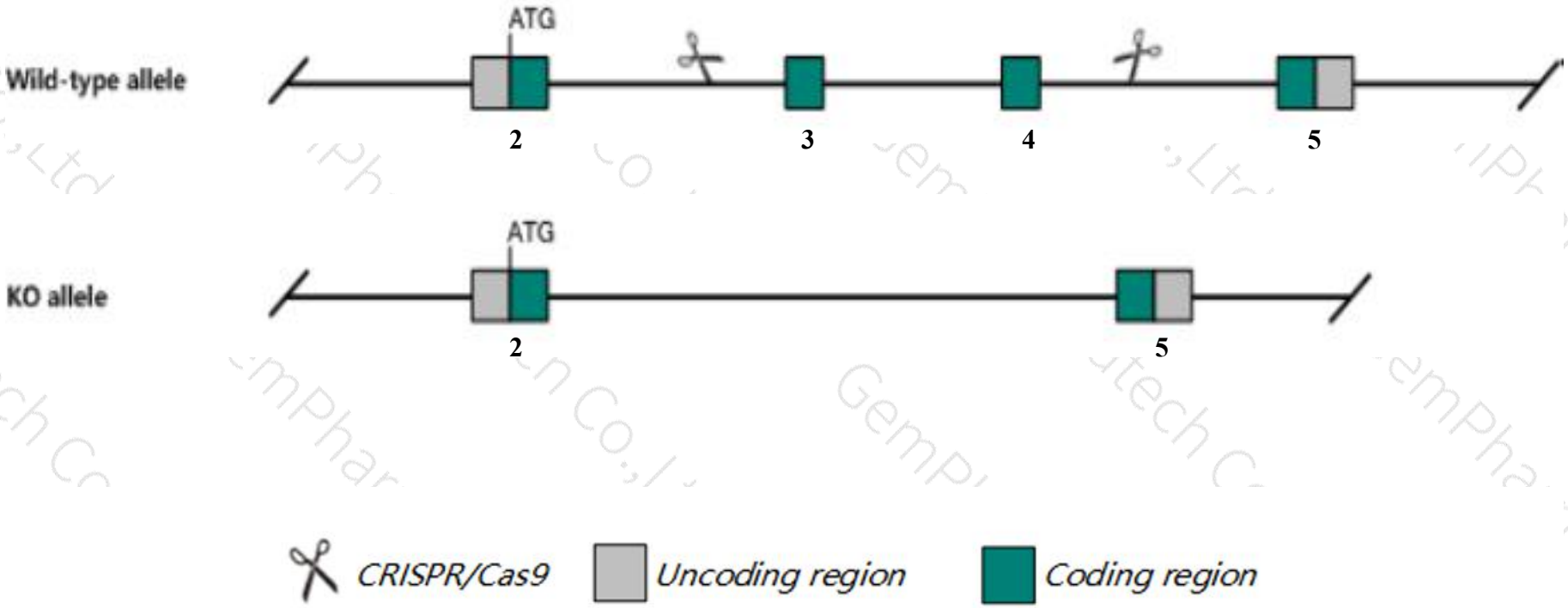
Project Overview

Project Name	***Pax9***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Pax9* gene. The schematic diagram is as follows:



Technical routes

➢ The *Pax9* gene has 3 transcripts. According to the structure of *Pax9* gene, exon3-exon4 of *Pax9-203* (ENSMUST00000153250.8) transcript is recommended as the knockout region.The region contains 770bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Pax9* gene. The brief process is as follows: CRISPR/Cas9 system v

Notice

- According to the existing MGI data,Homozygous inactivation of this gene results in abnormal tooth development and absent teeth and may lead to lack of pharyngeal pouch derivatives, athymia, craniofacial and limb anomalies, a small tympanic ring, various defects of the skeleton and musculature, and neonatal lethality.

- The knockout region is about 3KB from the 5-terminal of Gm15524 gene, which may affect its 5-terminal regulatory function.

- The *Pax9* gene is located on the Chr12. 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）

集萃药康 GemPharmatech

Pax9 paired box 9 [*Mus musculus* (house mouse)]

Gene ID: 18511, updated on 10-Mar-2020

Summary

Official Symbol	Pax9 provided by MGI
Official Full Name	paired box 9 provided by MGI
Primary source	MGI:MGI:97493
See related	Ensembl:ENSMUSG00000001497
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	Pax-9
Summary	This gene is a member of the paired box (PAX) family of transcription factors. Members of this gene family typically contain a paired box domain, an octapeptide, and a paired-type homeodomain. These genes play critical roles during fetal development and cancer growth. Mice lacking this gene exhibit impaired development of organs, musculature and the skeleton, including absent and abnormally developed teeth, and neonatal lethality. Mutations in the human gene are associated with selective tooth agenesis-3. [provided by RefSeq, Sep 2015]
Expression	Biased expression in thymus adult (RPKM 3.2), lung adult (RPKM 2.8) and 5 other tissues See more
Orthologs	human all

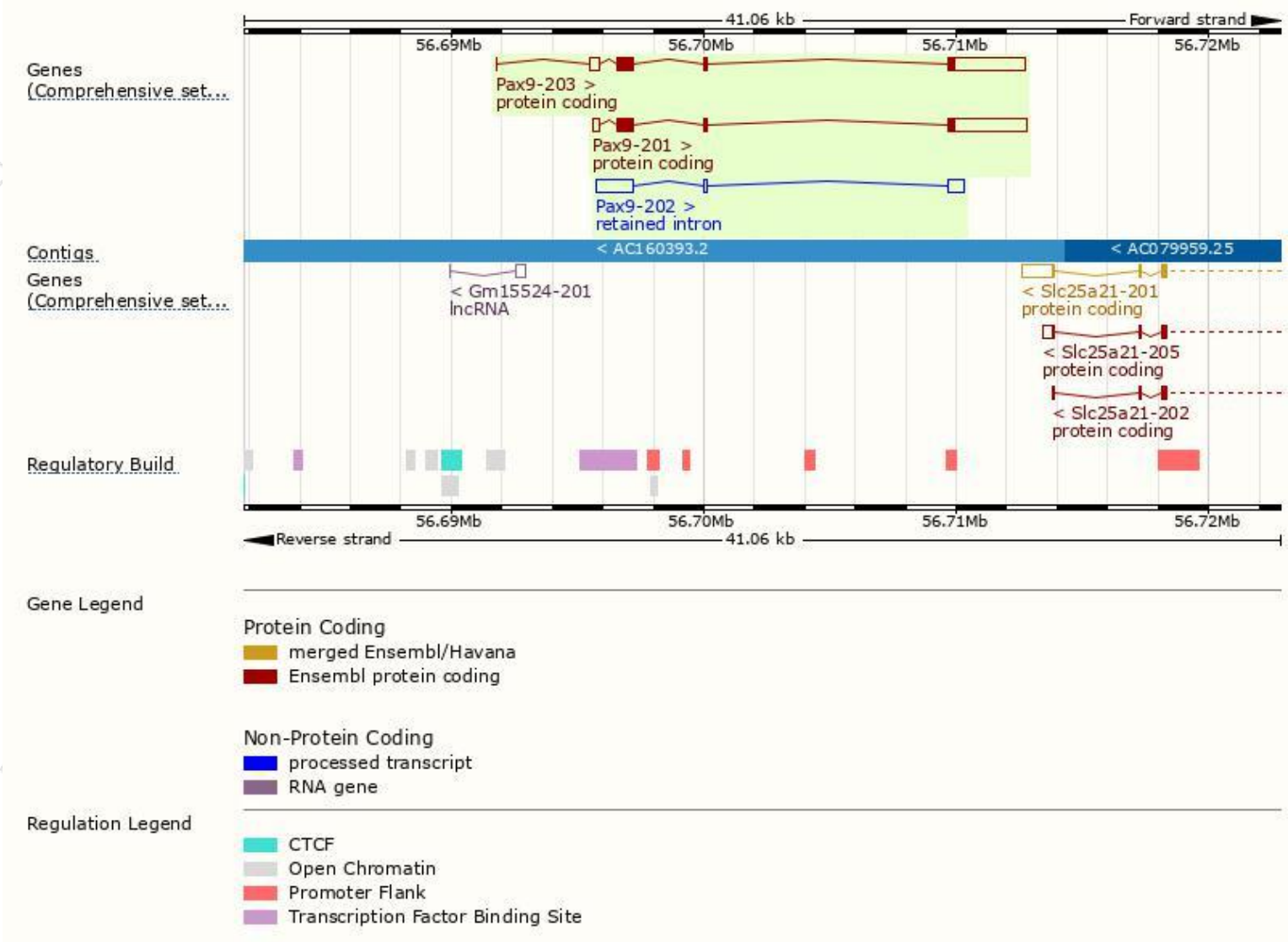
Transcript information（Ensembl）

The gene has 3 transcripts,all transcripts are shown below:

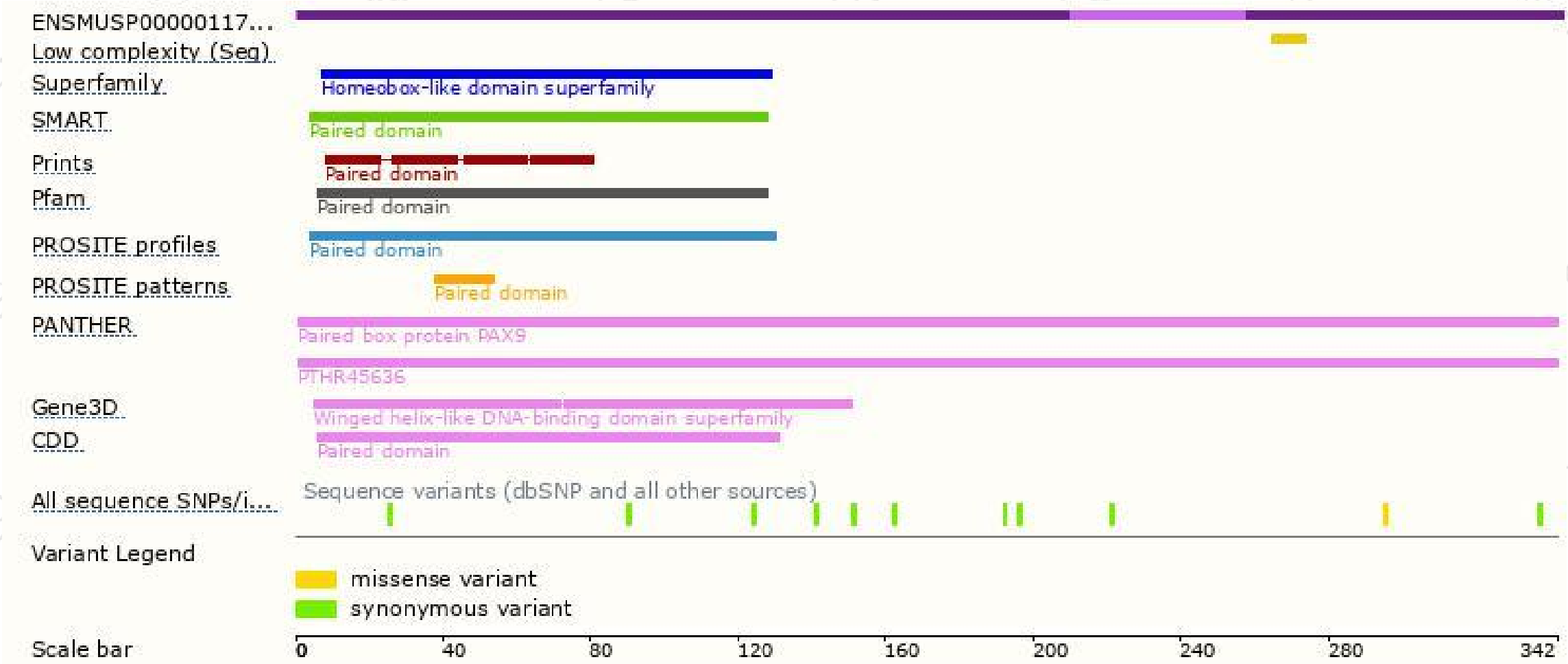
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Pax9-203	ENSMUST00000153250.8	4232	342aa	Protein coding	CCDS25924	P47242 Q3V1K1	TSL:5 GENCODE basic APPRIS P1
Pax9-201	ENSMUST00000001538.9	4166	342aa	Protein coding	CCDS25924	P47242 Q3V1K1	TSL:1 GENCODE basic APPRIS P1
Pax9-202	ENSMUST00000152848.1	2309	No protein	Retained intron	-	-	TSL:1

The strategy is based on the design of *Pax9-203* transcript,The transcription is shown below

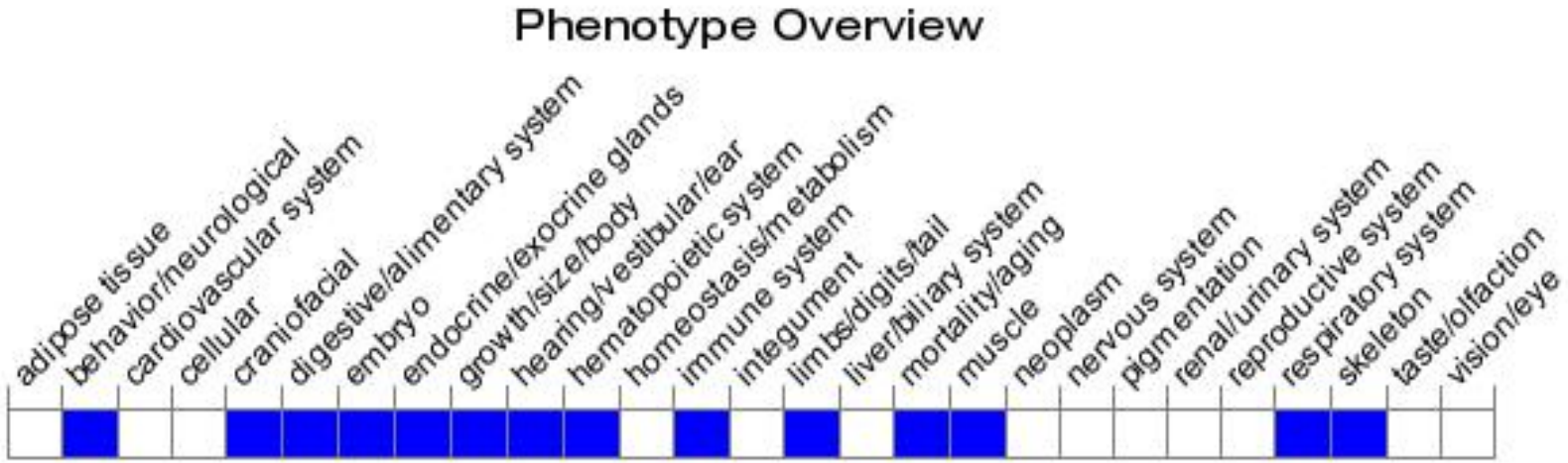
Genomic location distribution



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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