

# ***Riox1 Cas9-CKO Strategy***

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**Reviewer:**

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# Project Overview

**Project Name**

***Riox1***

**Project type**

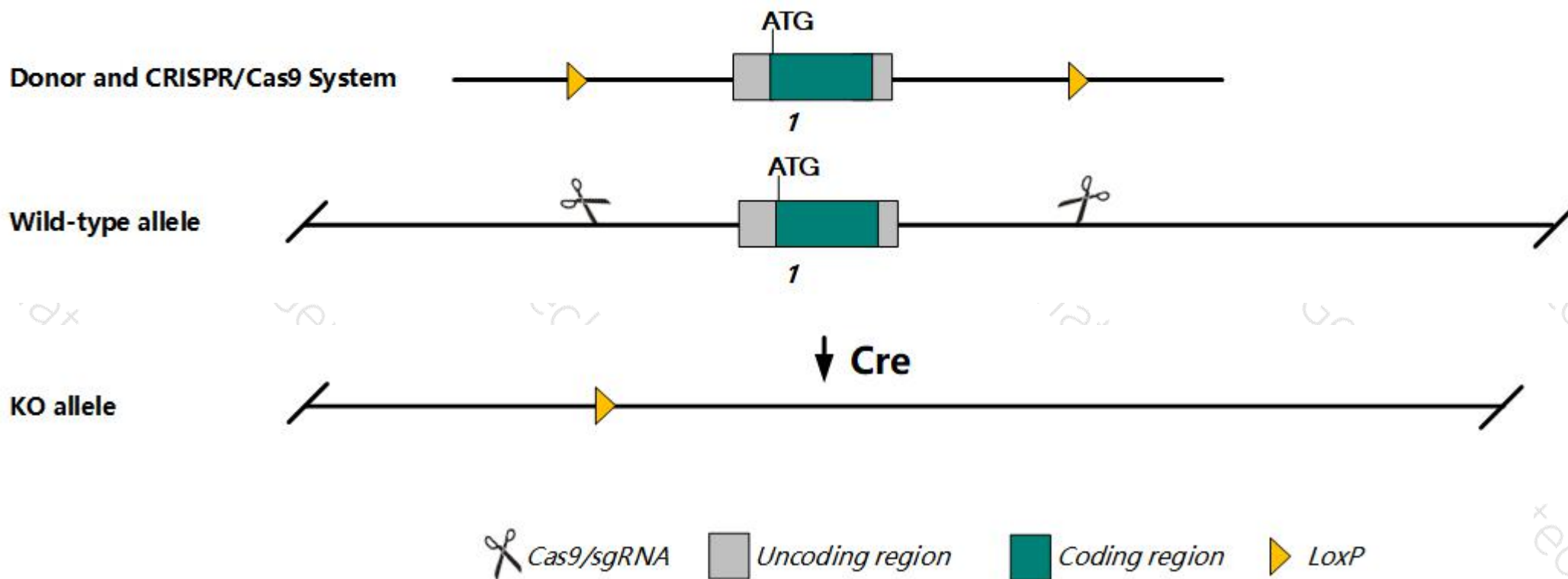
**Cas9-CKO**

**Strain background**

**C57BL/6JGpt**

# Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Riox1* gene. The schematic diagram is as follows:



# Technical routes

- The *Riox1* gene has 1 transcript. According to the structure of *Riox1* gene, exon1 of *Riox1*-201 ([ENSMUST00000053744.8](#)) transcript is recommended as the knockout region. The region contains all of coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Riox1* gene. The brief process is as follows: gRNA was transcribed in vitro, donor was constructed. Cas9, gRNA 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 or cell types.

- According to the existing MGI data , Mice homozygous for a knock-out allele activated in mesenchyme exhibit increased body length and weight, increased ossification with increased bone mass, bone mineral density, and volume, increased osteoblasts; and decrease osteoclasts.
- The *Riox1* 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

# Gene information ( NCBI )

## Riox1 ribosomal oxygenase 1 [ *Mus musculus* (house mouse) ]

Gene ID: 71952, updated on 12-Aug-2019

### Summary

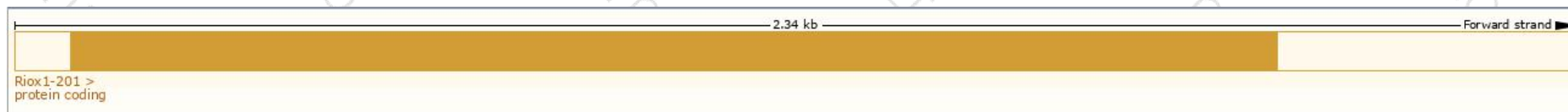
Official Symbol	Riox1 provided by <a href="#">MGI</a>
Official Full Name	ribosomal oxygenase 1 provided by <a href="#">MGI</a>
Primary source	<a href="#">MGI:MGI:1919202</a>
See related	<a href="#">Ensembl:ENSMUSG00000046791</a>
Gene type	protein coding
RefSeq status	VALIDATED
Organism	<a href="#">Mus musculus</a>
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	NO66; MAPJD; 2410016O06Rik
Orthologs	<a href="#">human</a> <a href="#">all</a>

# Transcript information ( Ensembl )

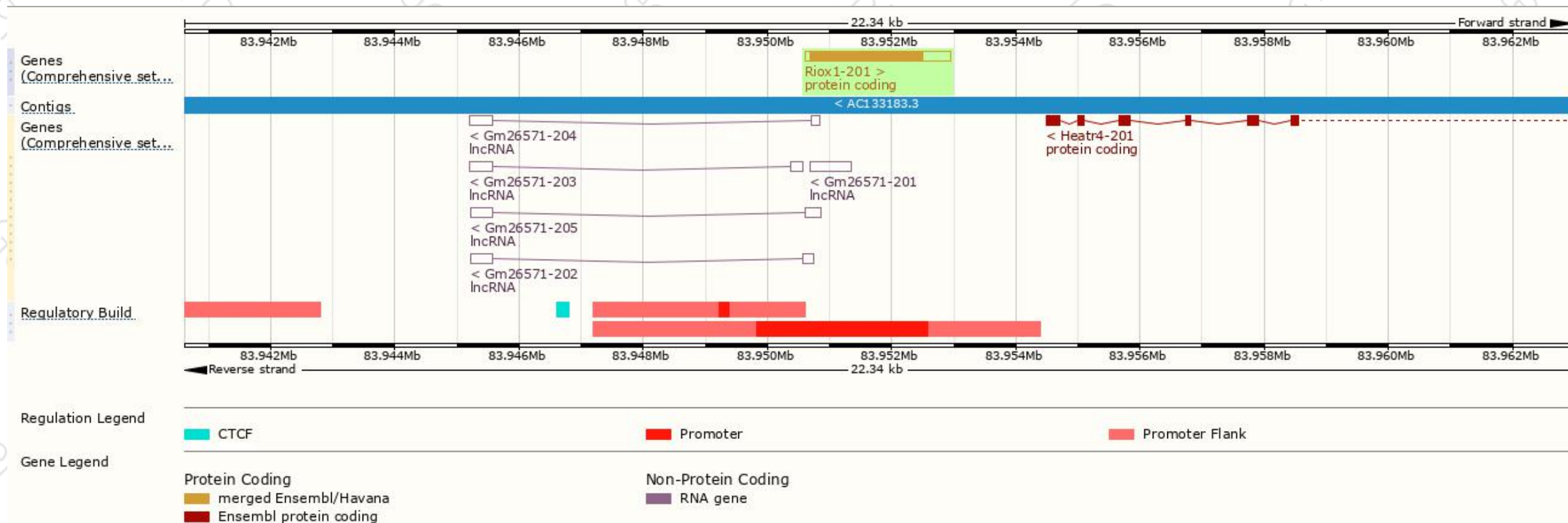
The gene has 1 transcript and all transcript is shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Riox1-201	<a href="#">ENSMUST00000053744.8</a>	2344	<a href="#">603aa</a>	Protein coding	<a href="#">CCDS26033</a>	<a href="#">Q9JF3</a>	TSL:NA Gencode basic APPRIS P1

The strategy is based on the design of *Riox1*-201 transcript, The transcription is shown below

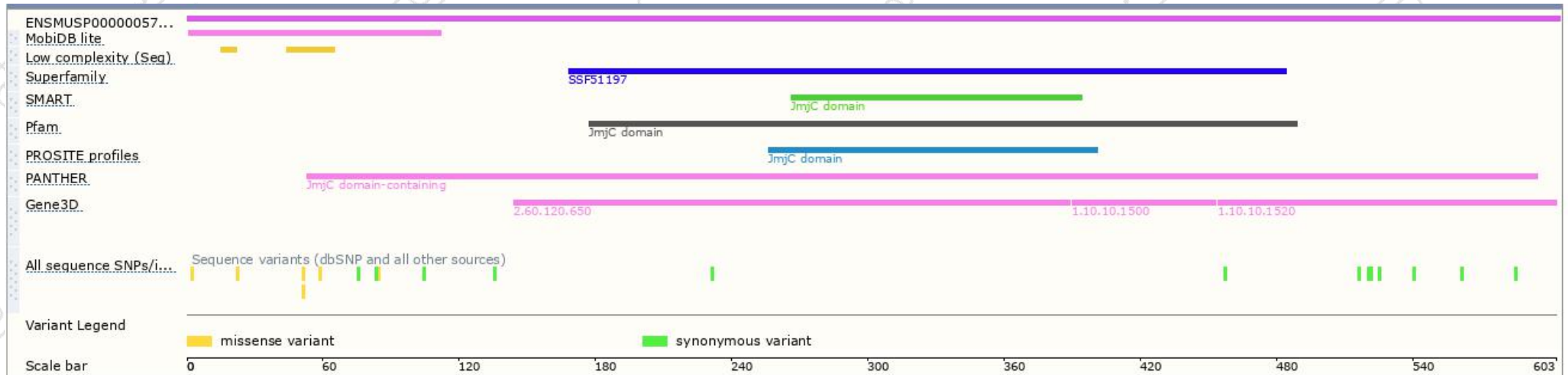


# Genomic location distribution





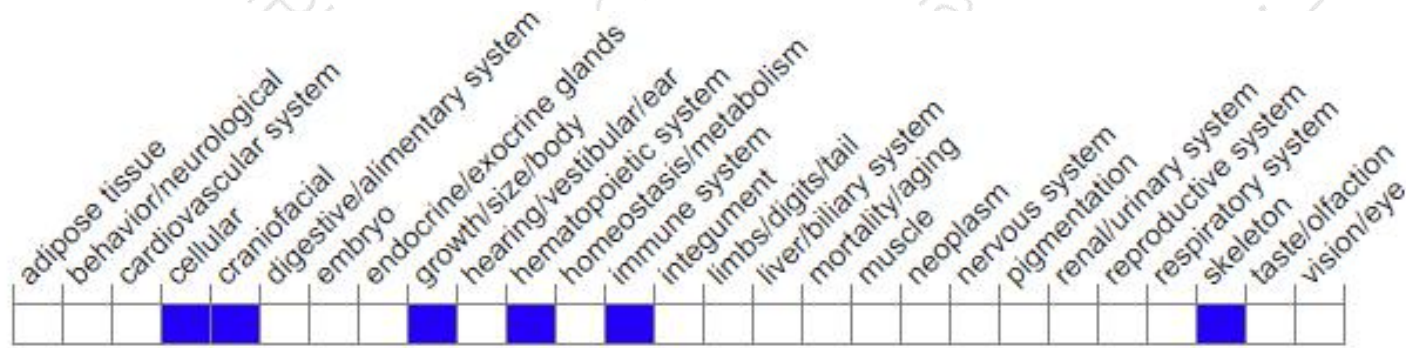
# Protein domain



### Statistics

Ave. residue weight: 112.034 g/mol  
Charge: 13.5  
Isoelectric point: 8.7788  
Molecular weight: 67,556.73 g/mol  
Number of residues: 603 aa

# Mouse phenotype description(MGI)



*Phenotypes affected by the gene are marked in blue. Data quoted from MGI database(<http://www.informatics.jax.org/>) .*

Mice homozygous for a knock-out allele activated in mesenchyme exhibit increased body length and weight, increased ossification with increased bone mass, bone mineral density, and volume, increased osteoblasts; and decrease osteoclasts.

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