Rho Cas9-KO Strategy

Designer: Jinling Wang

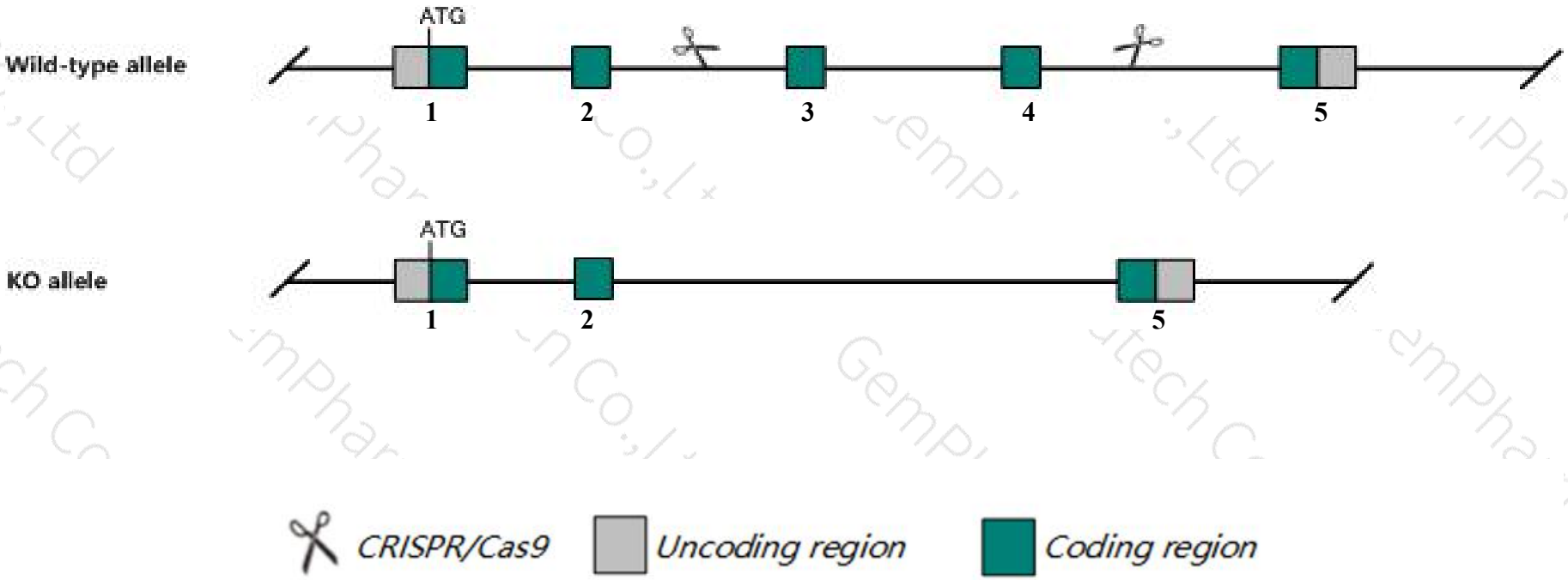
Design Date: 2019-7-17

Project Overview

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

Knockout strategy

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



Technical routes

➢ The *Rho* gene has 7 transcripts. According to the structure of *Rho* gene, exon3-exon4 of *Rho-201* (ENSMUST00000032471.8) transcript is recommended as the knockout region.The region contains 406bp coding sequence. Knock out the region will result in disruption of protein function.

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

Notice

➢ According to the existing MGI data,Targeted null homozygotes fail to develop retinal rod outer segments and lose their photoreceptors while heterozygotes exhibit some disorganization of their photoreceptors and a shortening of the outer segments with age. Some point mutants have only light-induced photoreceptor degeneration.

➢ The *Rho* gene is located on the Chr6. 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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Rho rhodopsin [Mus musculus (house mouse)]

Gene ID: 212541, updated on 5-Mar-2019

Summary

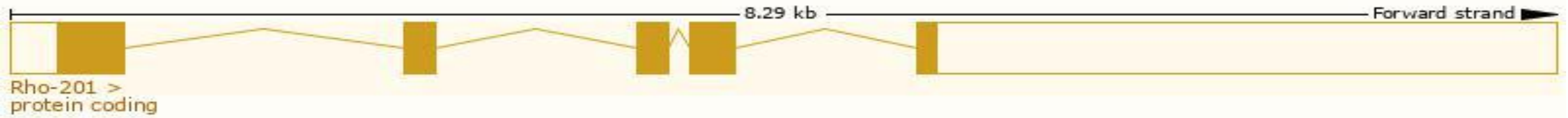
Official Symbol	Rho provided by MGI
Official Full Name	rhodopsin provided byMGI
Primary source	MGI:MGI:97914
See related	Ensembl:ENSMUSG00000030324
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Noerg1, Opn2, Ops, RP4
Expression	Low expression observed in reference datasetSee more
Orthologs	human all

Transcript information（Ensembl）

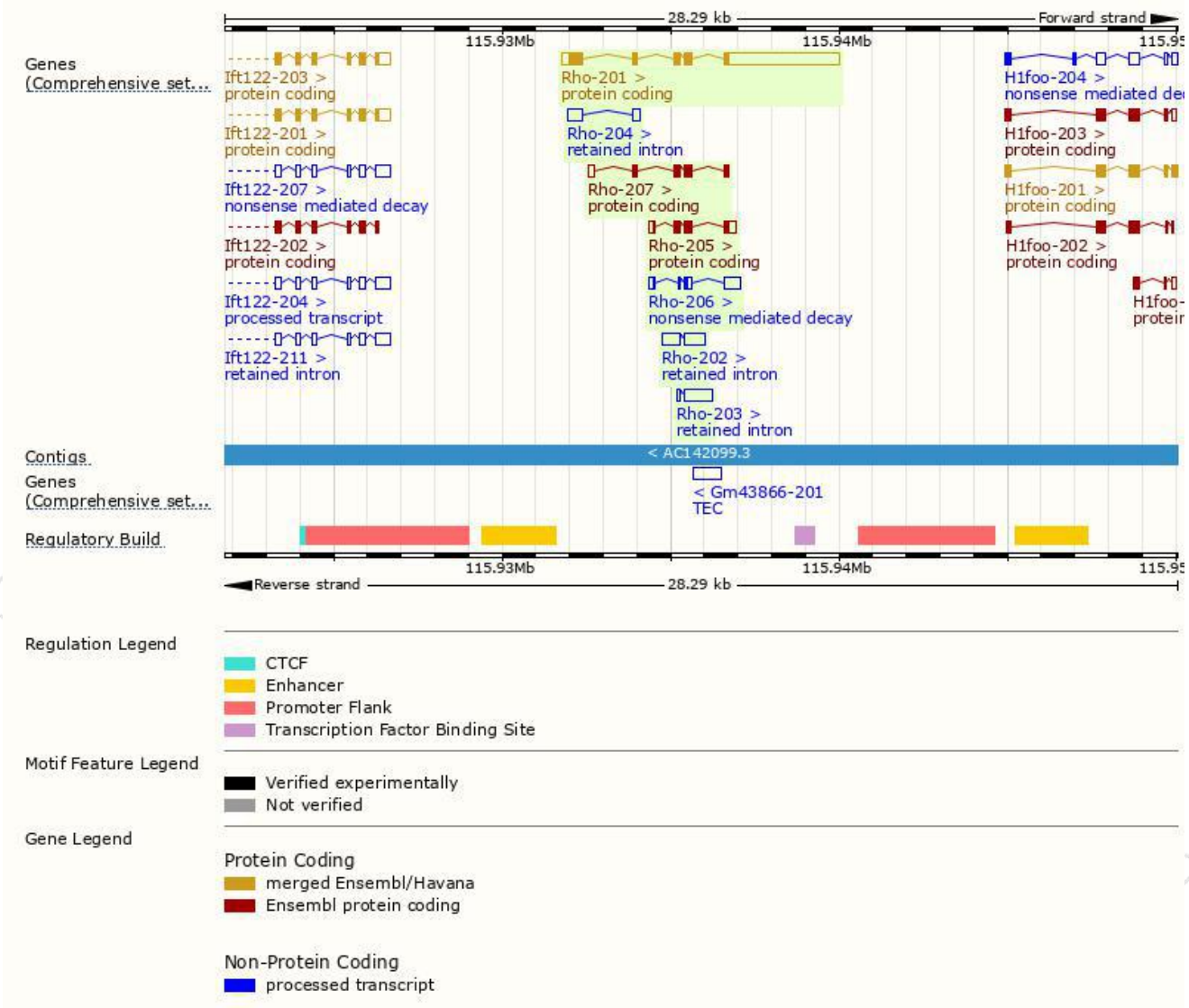
The gene has 7 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Rho-201	ENSMUST00000032471.8	4621	348aa	Protein coding	CCDS20446	P15409	TSL:1 GENCODE basic APPRIS P1
Rho-205	ENSMUST00000203877.1	939	189aa	Protein coding	-	A0A0N4SV48	TSL:2 GENCODE basic
Rho-207	ENSMUST00000204711.2	870	203aa	Protein coding	-	A0A0N4SUP8	CDS 3' incomplete TSL:3
Rho-206	ENSMUST00000204493.1	883	54aa	Nonsense mediated decay	-	A0A0N4SWC6	TSL:3
Rho-202	ENSMUST00000203284.1	1186	No protein	Retained intron	-	-	TSL:2
Rho-203	ENSMUST00000203323.1	911	No protein	Retained intron	-	-	TSL:2
Rho-204	ENSMUST00000203531.1	683	No protein	Retained intron	-	-	TSL:2

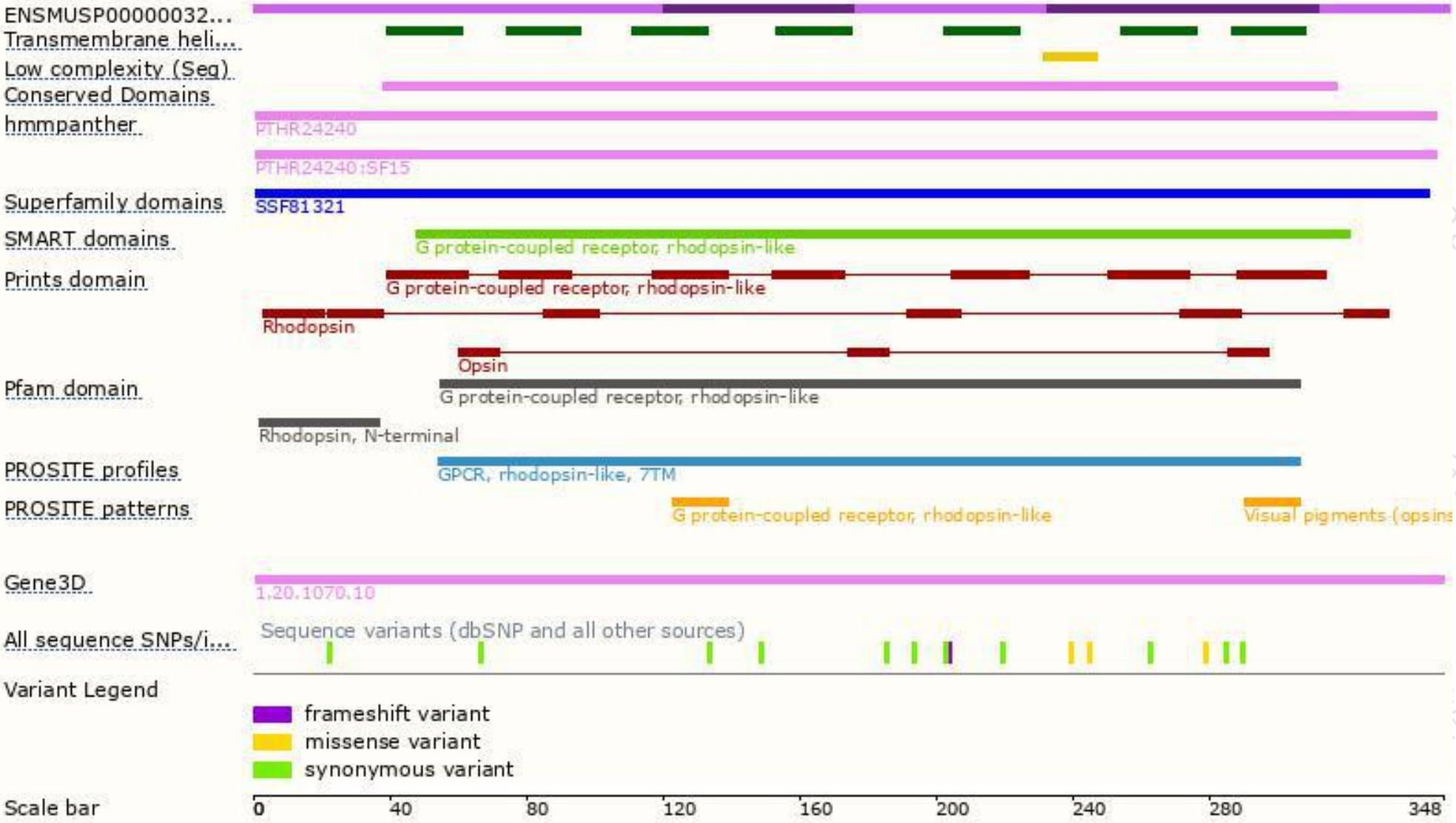
The strategy is based on the design of *Rho-201* transcript,The transcription is shown below



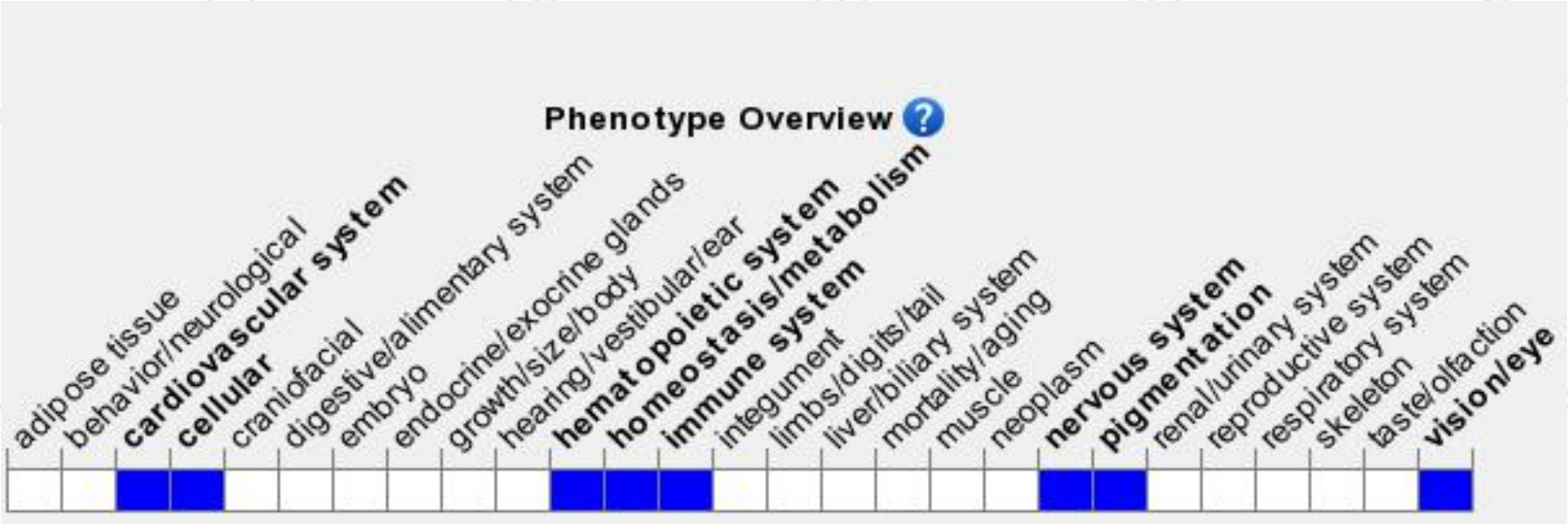
Genomic location distribution



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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