Nup50 Cas9-KO Strategy

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Reviewer: Xiaojing Li

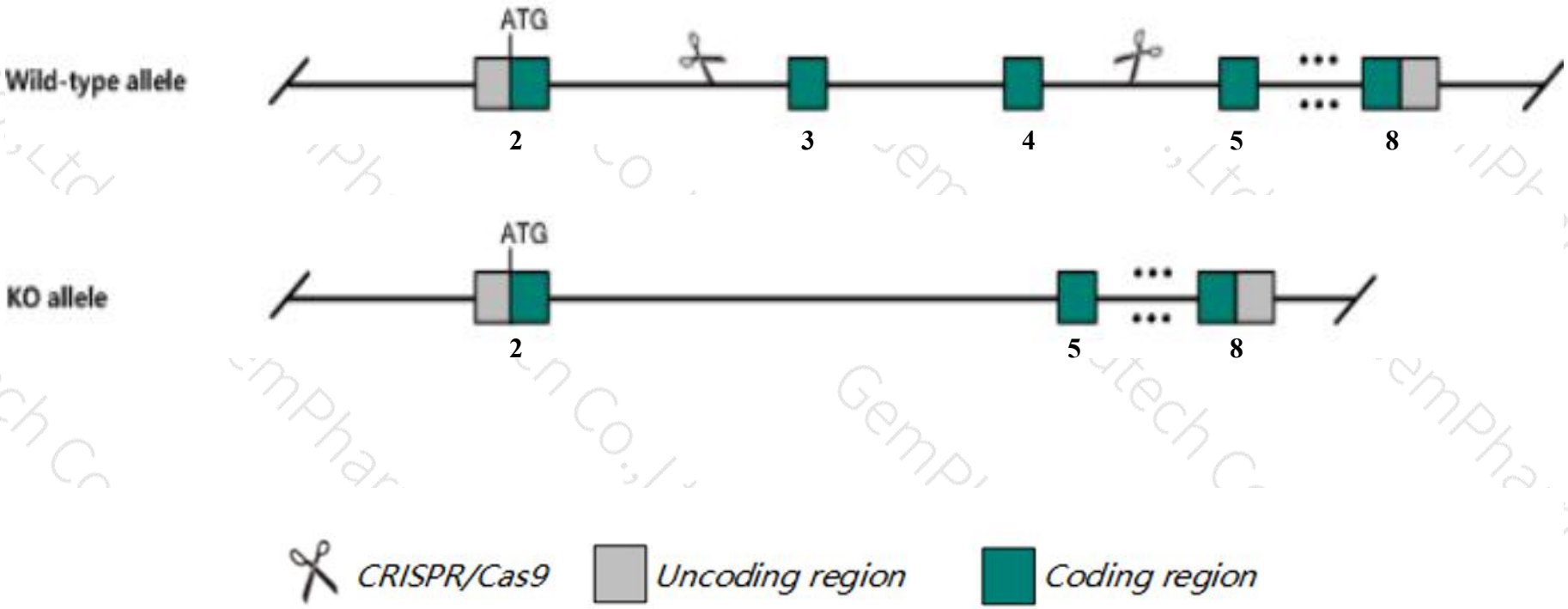
Design Date: 2020-7-23

Project Overview

Project Name	***Nup50***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Nup50* gene. The schematic diagram is as follows:



Technical routes

➢ The *Nup50* gene has 2 transcripts. According to the structure of *Nup50* gene, exon3-exon4 of *Nup50-201*(ENSMUST00000165443.3) transcript is recommended as the knockout region.The region contains 268bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Nup50* gene. The brief process is as follows: CRISPR/Cas9 system 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,mice homozygous for a targeted null mutation die perinatally, displaying neural tube defects, exencephaly, and intrauterine growth retardation.

➢ The *Nup50* 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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Nup50 nucleoporin 50 [Mus musculus (house mouse)]

Gene ID: 18141, updated on 13-Mar-2020

Summary

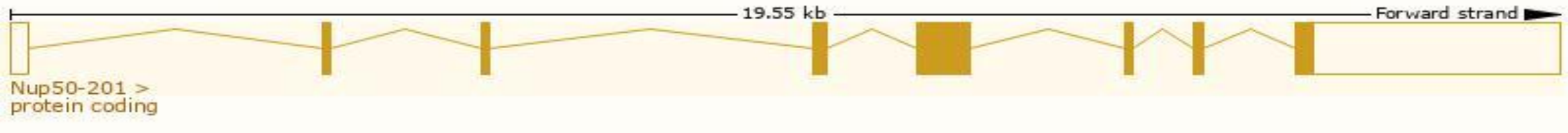
Official Symbol	Nup50 provided by MGI
Official Full Name	nucleoporin 50 provided byMGI
Primary source	MGI:MGI:1351502
See related	Ensembl:ENSMUSG00000016619
Gene type	protein coding
RefSeq status	PROVISIONAL
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	1700030K07Rik, AI413123, Npap60
Expression	Ubiquitous expression in CNS E11.5 (RPKM 13.0), placenta adult (RPKM 9.6) and 28 other tissuesSee more
Orthologs	human all

Transcript information（Ensembl）

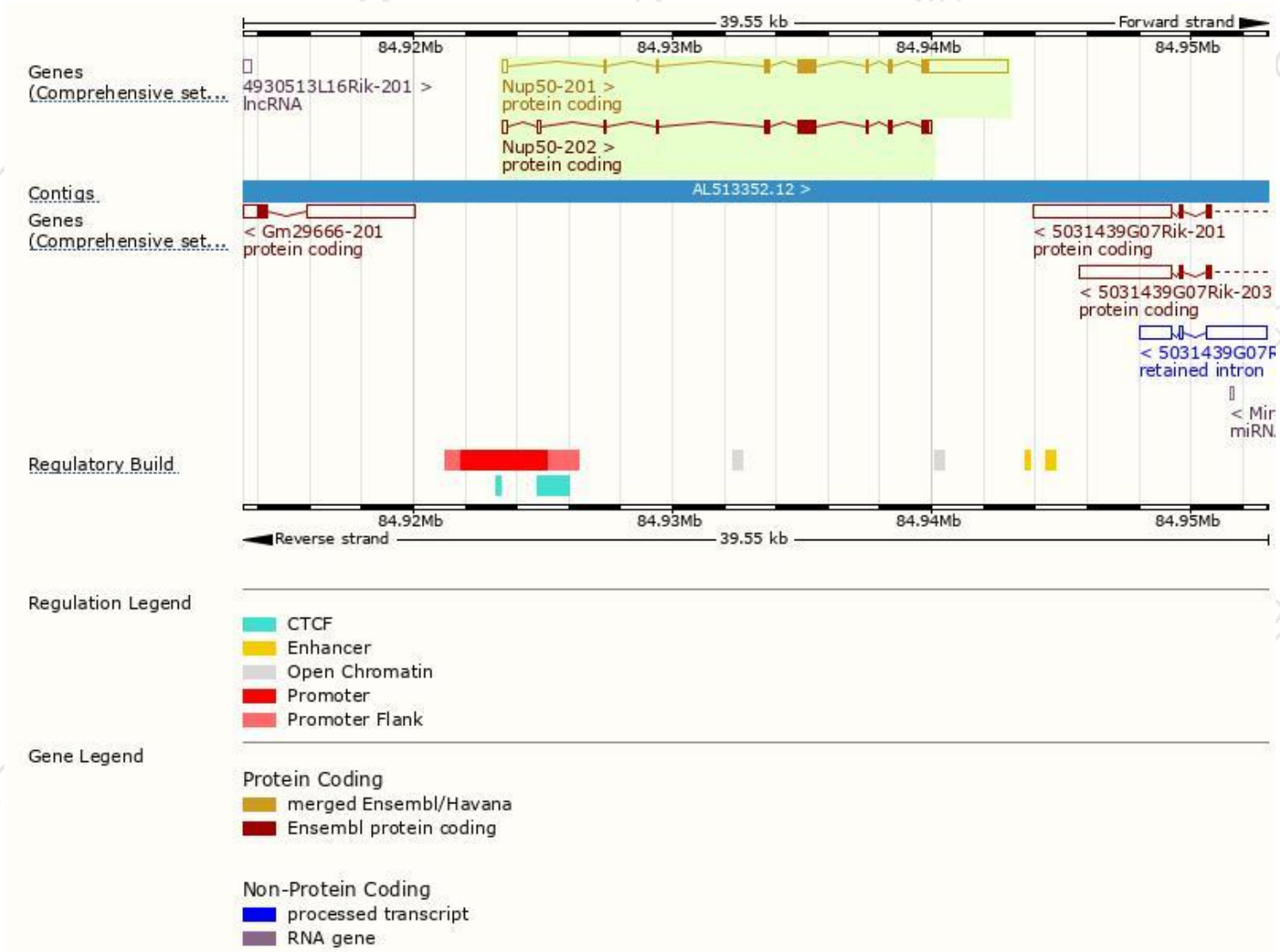
The gene has 2 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Nup50-201	ENSMUST00000165443.3	4766	466aa	Protein coding	CCDS27714	Q9JIH2	TSL:1 GENCODE basic APPRIS P1
Nup50-202	ENSMUST00000230411.1	1900	466aa	Protein coding	CCDS27714	Q9JIH2	GENCODE basic APPRIS P1

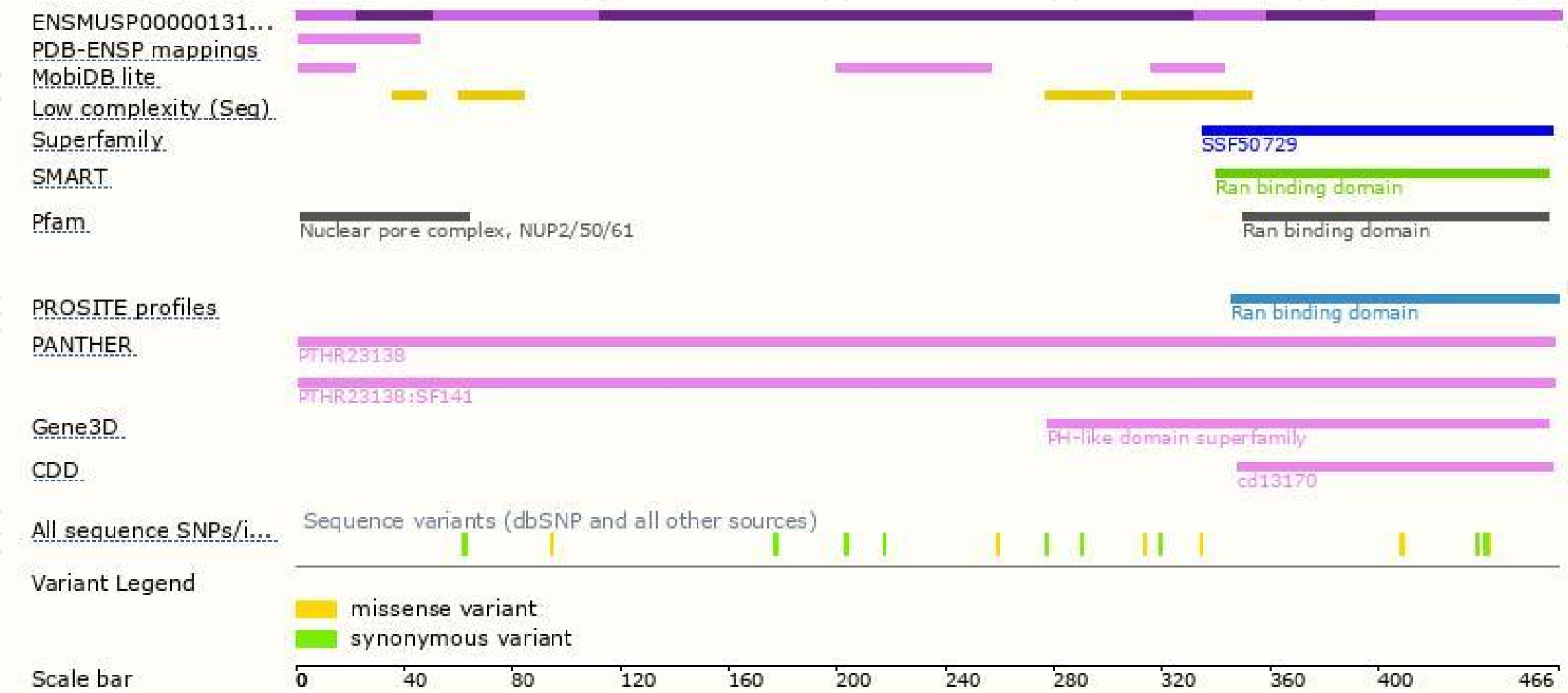
The strategy is based on the design of *Nup50-201* transcript,the transcription is shown below:



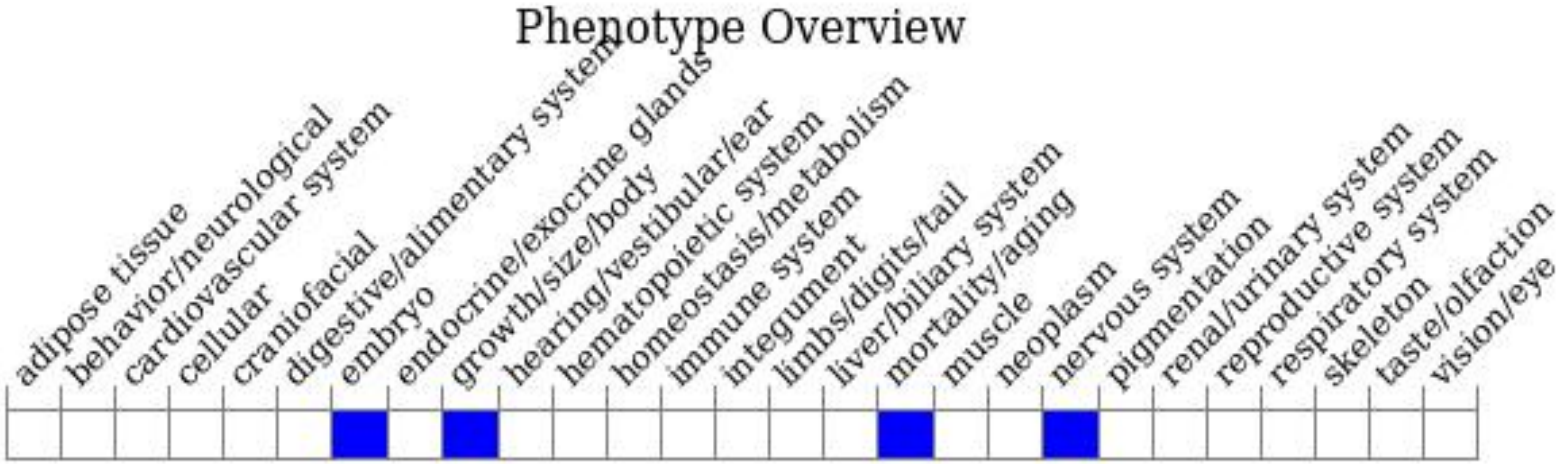
Genomic location distribution



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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