

Hnrnpa1 Cas9-KO Strategy

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Design Date:	2020-4-28

Project Overview

Project Name

Hnrnpa1

Project type

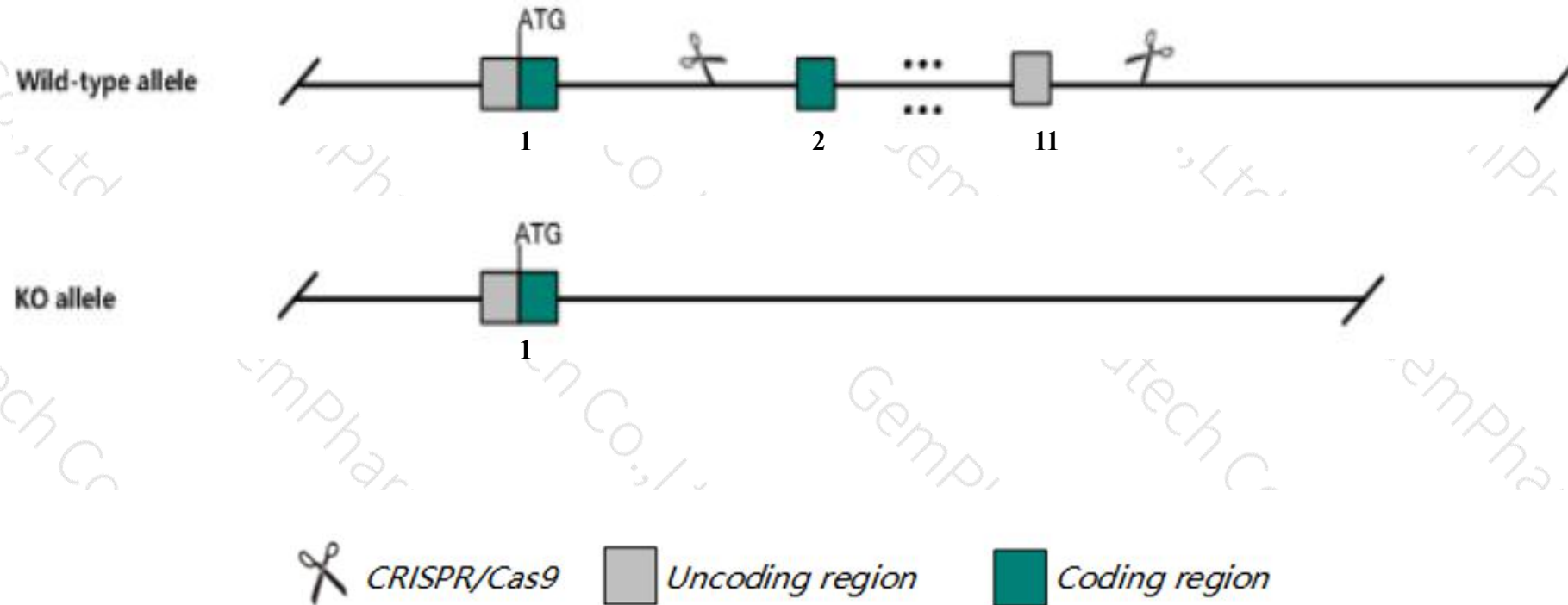
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Hnrnpa1* gene. The schematic diagram is as follows:



- The *Hnrnpa1* gene has 5 transcripts. According to the structure of *Hnrnpa1* gene, exon2-exon11 of *Hnrnpa1-201* (ENSMUST00000036004.15) transcript is recommended as the knockout region. The region contains all of the coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Hnrnpa1* gene. The brief process is as follows: CRISPR/Cas9 system

- According to the existing MGI data, mice homozygous for a knock-out allele exhibit prenatal and neonatal lethality, dilated cardiomyopathy, and hypoplastic tongue and intercostal muscles. mice heterozygous for a knock-out allele exhibit altered cardiac signaling, increased heart rate and increased systemic arterial systolic blood pressure.
- The KO region is about 0.7kb away from the *Cbx5* gene. Knockout the region may affect the function of *Cbx5* gene .
- The *Hnrnpa1* 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)

Hnrnpa1 heterogeneous nuclear ribonucleoprotein A1 [Mus musculus (house mouse)]

Gene ID: 15382, updated on 13-Mar-2020

Summary



Official Symbol Hnrnpa1 provided by [MGI](#)

Official Full Name heterogeneous nuclear ribonucleoprotein A1 provided by [MGI](#)

Primary source [MGI:MGI:104820](#)

See related [Ensembl:ENSMUSG00000046434](#)

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 HDP-1, Hdp, Hnrpa1, hnRNP A1, hnrnp-A1

Expression Biased expression in CNS E11.5 (RPKM 643.9), CNS E14 (RPKM 307.8) and 11 other tissues [See more](#)

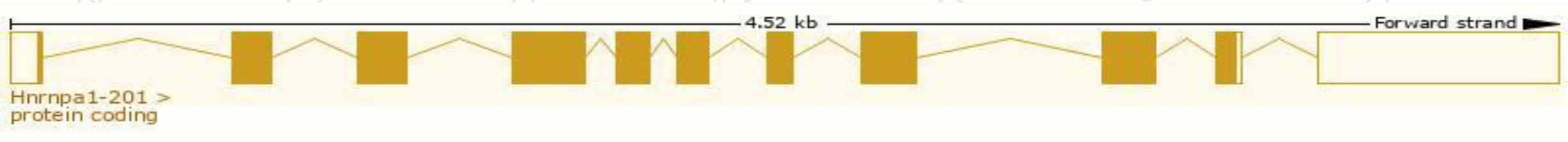
Orthologs [human](#) [all](#)

Transcript information (Ensembl)

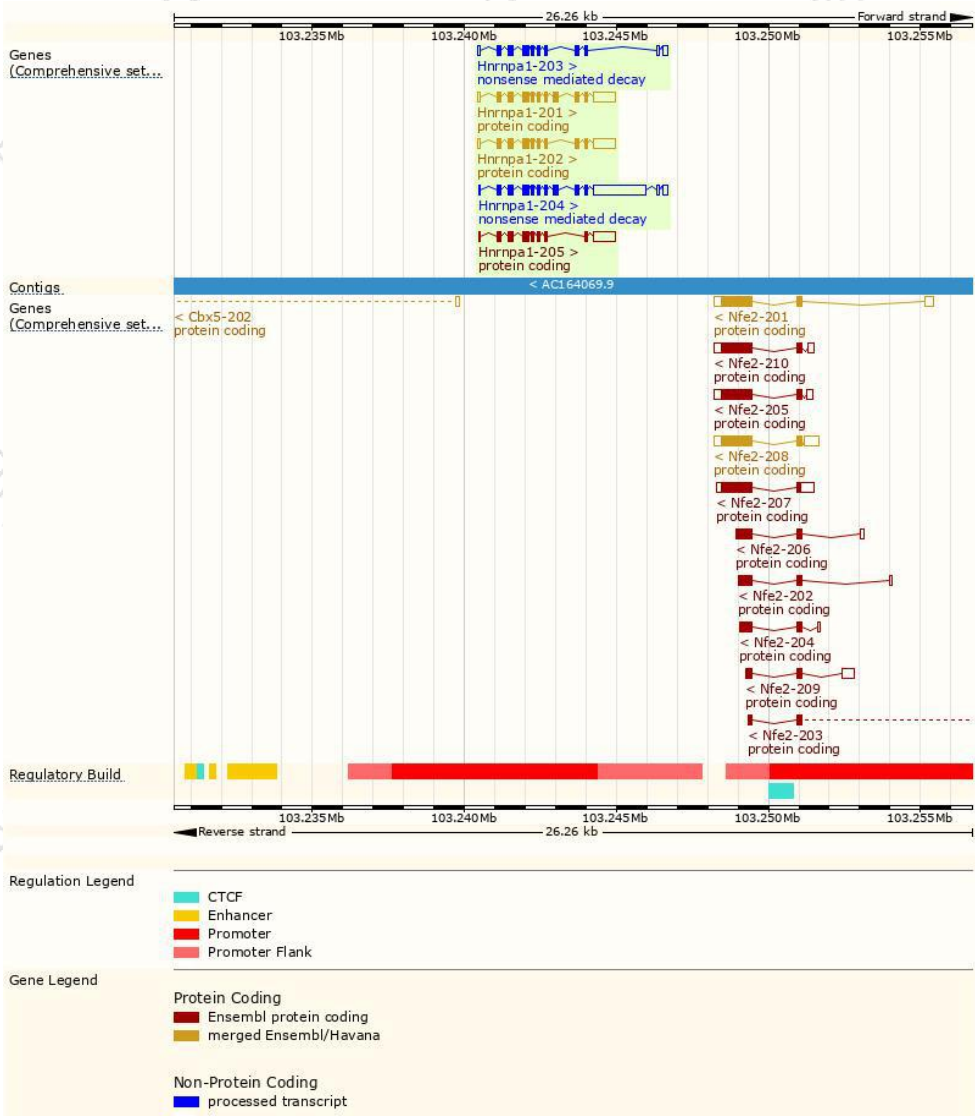
The gene has 5 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Hnrnpa1-201	ENSMUST00000036004.15	1918	373aa	Protein coding	CCDS37232	Q5EBP8	TSL:1 GENCODE basic APPRIS is a system to annotate alternatively spliced transcripts based on a range of computational methods to identify the most functionally important transcript(s) of a gene. APPRIS P4
Hnrnpa1-202	ENSMUST00000087351.8	1737	320aa	Protein coding	CCDS37233	P49312	TSL:1 GENCODE basic APPRIS is a system to annotate alternatively spliced transcripts based on a range of computational methods to identify the most functionally important transcript(s) of a gene. APPRIS ALT1
Hnrnpa1-205	ENSMUST000000231141.1	1541	268aa	Protein coding	-	P49312	GENCODE basic
Hnrnpa1-204	ENSMUST000000230489.1	3118	373aa	Nonsense mediated decay	-	Q5EBP8	
Hnrnpa1-203	ENSMUST000000230171.1	1283	320aa	Nonsense mediated decay	-	P49312	

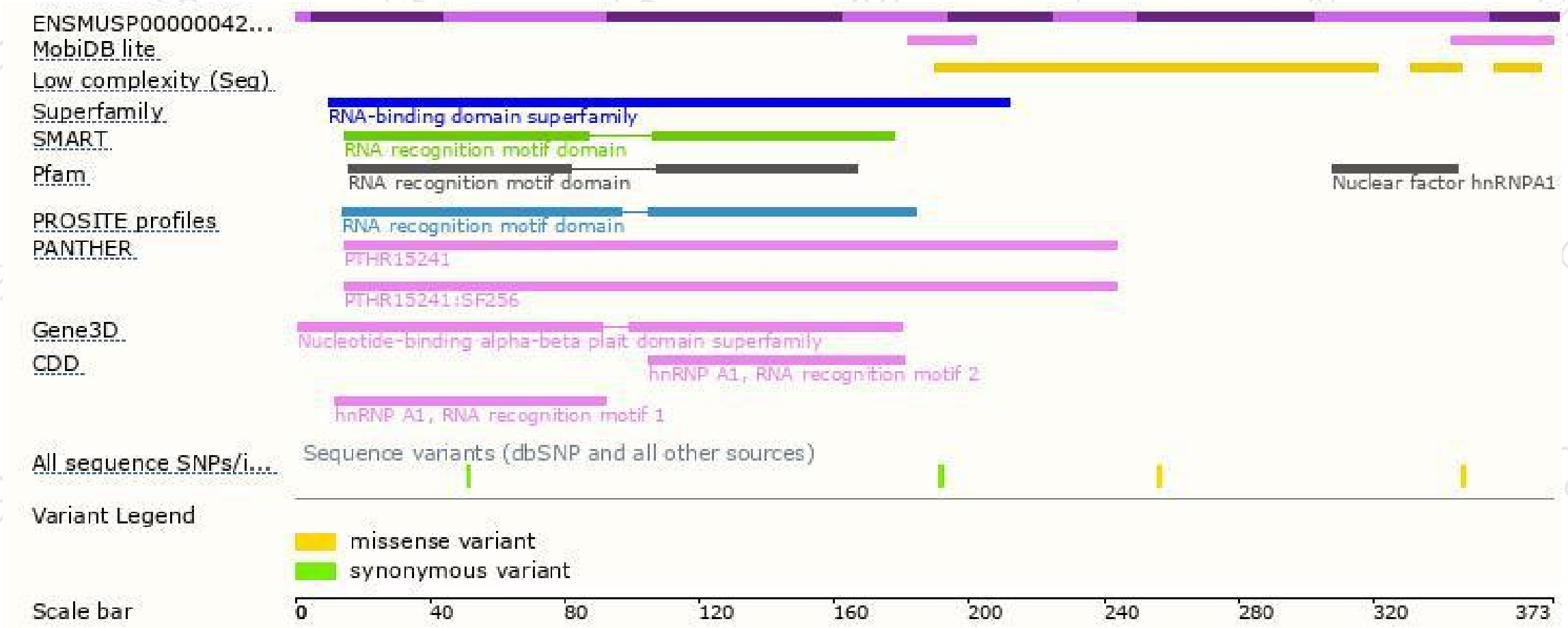
The strategy is based on the design of *Hnrnpa1-201* transcript,the transcription is shown below:



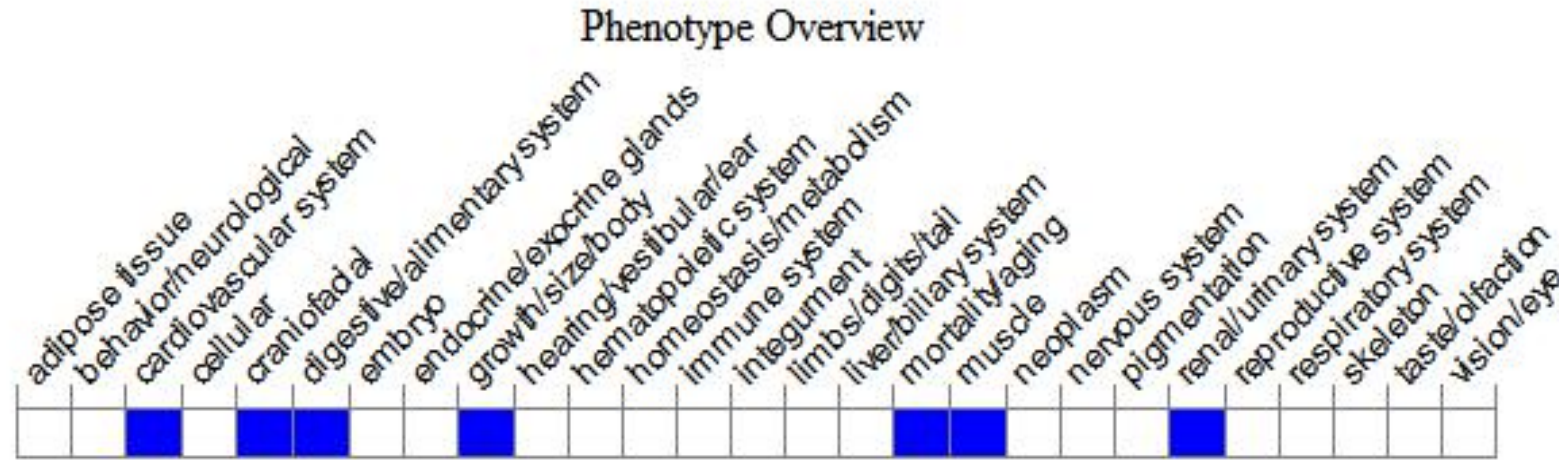
Genomic location distribution



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 prenatal and neonatal lethality, dilated cardiomyopathy, and hypoplastic tongue and intercostal muscles. Mice heterozygous for a knock-out allele exhibit altered cardiac signaling, increased heart rate and increased systemic arterial systolic blood pressure.

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

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