Arhgap21 Cas9-KO Strategy

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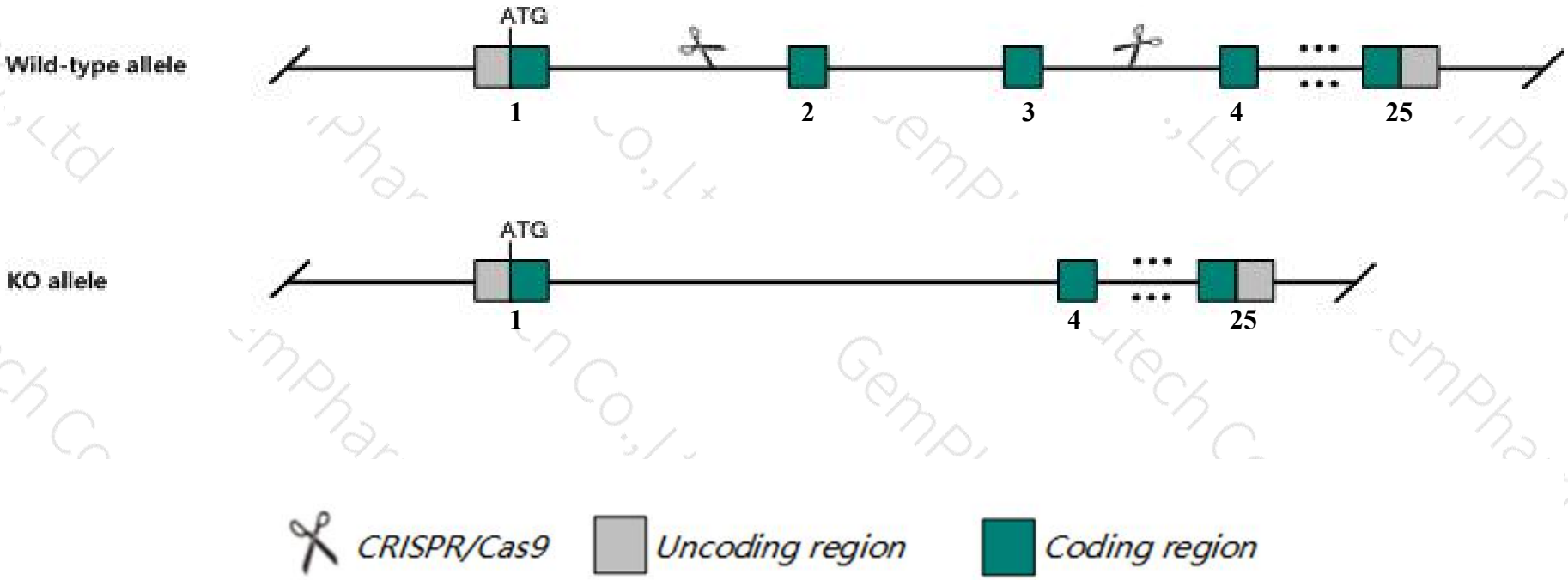
Design Date: 2020-3-3

Project Overview

Project Name	***Arhgap21***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Arhgap21* gene. The schematic diagram is as follows:



Technical routes

➢ The *Arhgap21* gene has 18 transcripts. According to the structure of *Arhgap21* gene, exon2-exon3 of *Arhgap21-210* (ENSMUST00000154230.8) transcript is recommended as the knockout region.The region contains 205bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Arhgap21* gene. The brief process is as follows: CRISPR/Cas9 sys

Notice

➢ According to the existing MGI data,Mice homozygous for a gene trap allele exhibit die by E8. Mice heterozygous for the allele exhibit enhanced egress of HSC from the bone marrow resulting in decreased red blood cells, hemoglobin and platelets but increased leukocytes and neutrophils.

➢ Transcript 217 CDS 5' incomplete the influences is unknown. Transcript 216 CDS 5' and 3' incomplete the influences is unknown.

➢ The *Arhgap21* gene is located on the Chr2. 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

Gene information（NCBI）

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Arhgap21 Rho GTPase activating protein 21 [Mus musculus (house mouse)]

Gene ID: 71435, updated on 31-Jan-2019

Summary

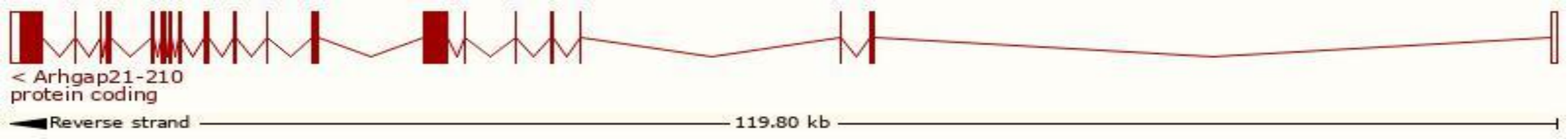
Official Symbol	Arhgap21 provided by MGI
Official Full Name	Rho GTPase activating protein 21 provided byMGI
Primary source	MGI:MGI:1918685
See related	Ensembl:ENSMUSG00000036591
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	5530401C11Rik, AA416458, ARHGAP10
Expression	Ubiquitous expression in cerebellum adult (RPKM 9.5), CNS E14 (RPKM 6.4) and 26 other tissuesSee more
Orthologs	human all

Transcript information（Ensembl）

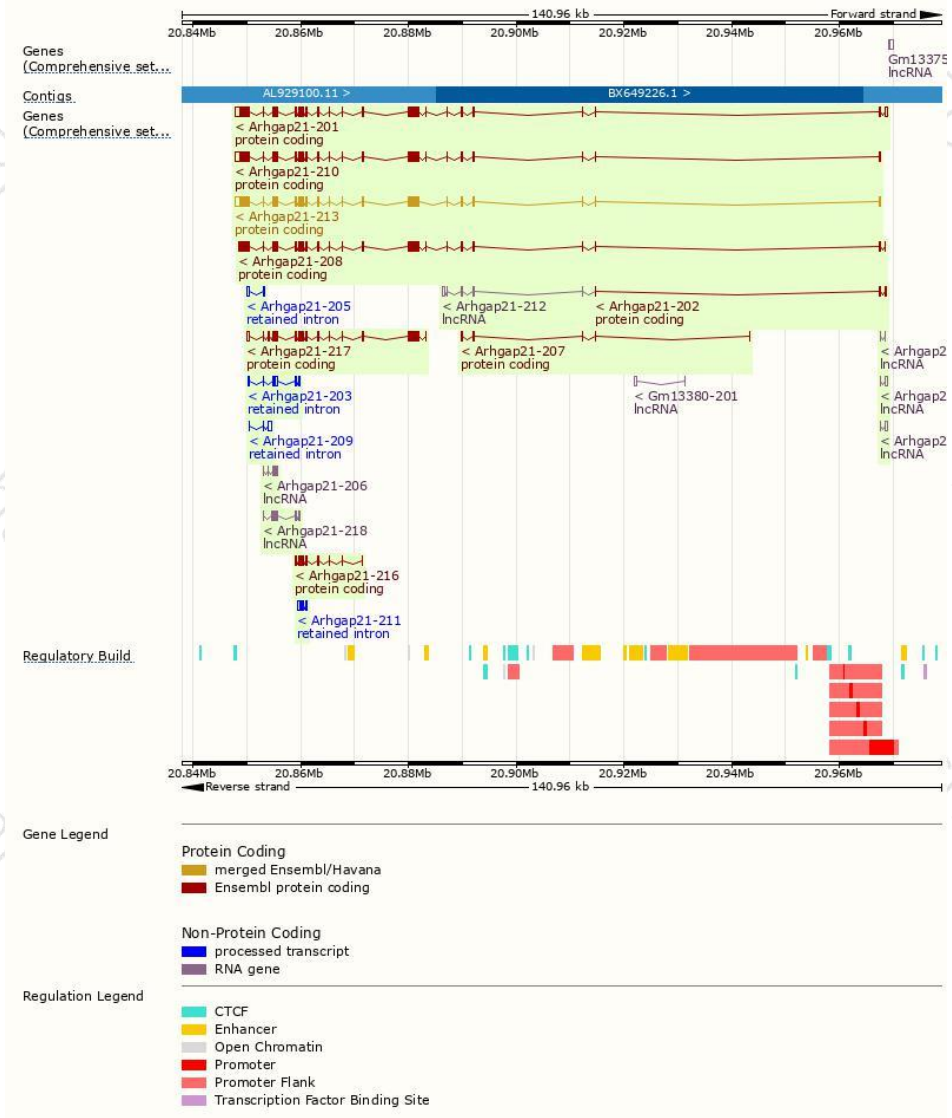
The gene has 18 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Arhgap21-210	ENSMUST00000154230.8	6972	1955aa	Protein coding	CCDS50512	B7ZCJ1	TSL:1 GENCODE basic APPRIS ALT2
Arhgap21-213	ENSMUST00000173194.7	6920	1945aa	Protein coding	CCDS38054	B7ZCJ0	TSL:1 GENCODE basic APPRIS P3
Arhgap21-208	ENSMUST00000141298.8	6339	1955aa	Protein coding	CCDS50512	B7ZCJ1	TSL:5 GENCODE basic APPRIS ALT2
Arhgap21-201	ENSMUST00000114594.7	7351	1949aa	Protein coding	-	A0A0A0MQE8	TSL:5 GENCODE basic APPRIS ALT2
Arhgap21-217	ENSMUST00000174584.7	4299	1263aa	Protein coding	-	G3UWM5	CDS 5' incomplete TSL:5
Arhgap21-216	ENSMUST00000173784.1	1189	396aa	Protein coding	-	G3UX38	5' and 3' truncations in transcript evidence prevent annotation of the start and the end of the CDS. CDS 5' and 3' incomplete TSL:5
Arhgap21-202	ENSMUST00000125783.2	549	31aa	Protein coding	-	F6WQR2	CDS 3' incomplete TSL:5
Arhgap21-207	ENSMUST00000140230.1	489	145aa	Protein coding	-	A2BHQ2	CDS 3' incomplete TSL:5
Arhgap21-203	ENSMUST00000127512.7	884	No protein	Retained intron	-	-	TSL:5
Arhgap21-211	ENSMUST00000154657.1	799	No protein	Retained intron	-	-	TSL:2
Arhgap21-209	ENSMUST00000143491.2	712	No protein	Retained intron	-	-	TSL:2
Arhgap21-205	ENSMUST00000131542.1	644	No protein	Retained intron	-	-	TSL:2
Arhgap21-212	ENSMUST00000156142.2	697	No protein	lncRNA	-	-	TSL:5
Arhgap21-218	ENSMUST00000174825.2	569	No protein	lncRNA	-	-	TSL:5
Arhgap21-214	ENSMUST00000173566.1	444	No protein	lncRNA	-	-	TSL:3
Arhgap21-215	ENSMUST00000173654.1	424	No protein	lncRNA	-	-	TSL:3
Arhgap21-206	ENSMUST00000136241.8	323	No protein	lncRNA	-	-	TSL:5
Arhgap21-204	ENSMUST00000131394.1	165	No protein	lncRNA	-	-	TSL:5

The strategy is based on the design of *Arhgap21-210* transcript,The transcription is shown below

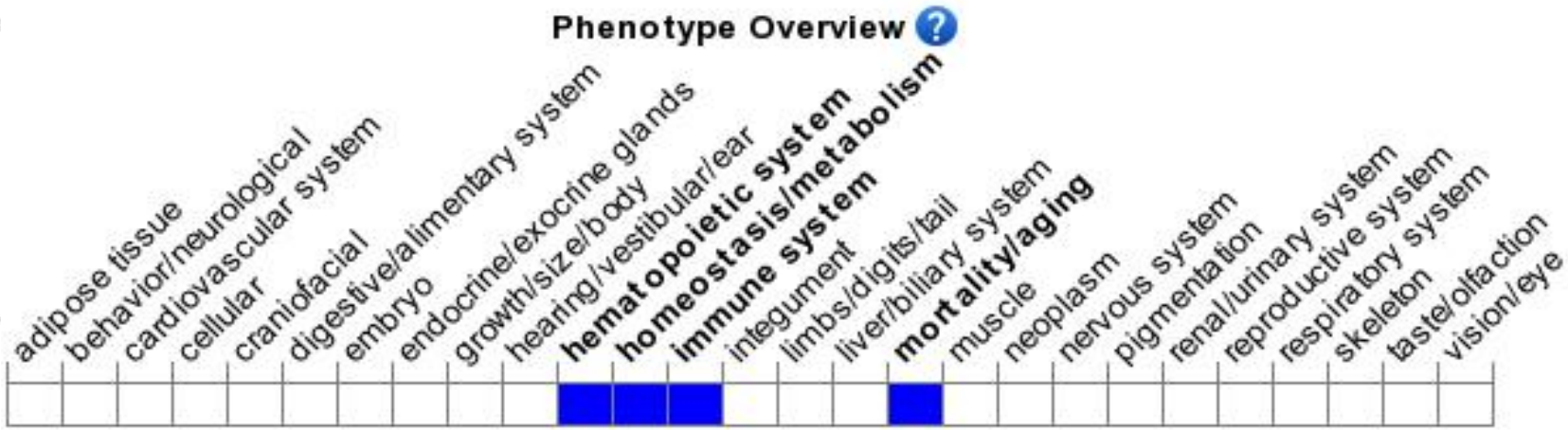


Genomic location distribution



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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