Adarb1 Cas9-KO Strategy

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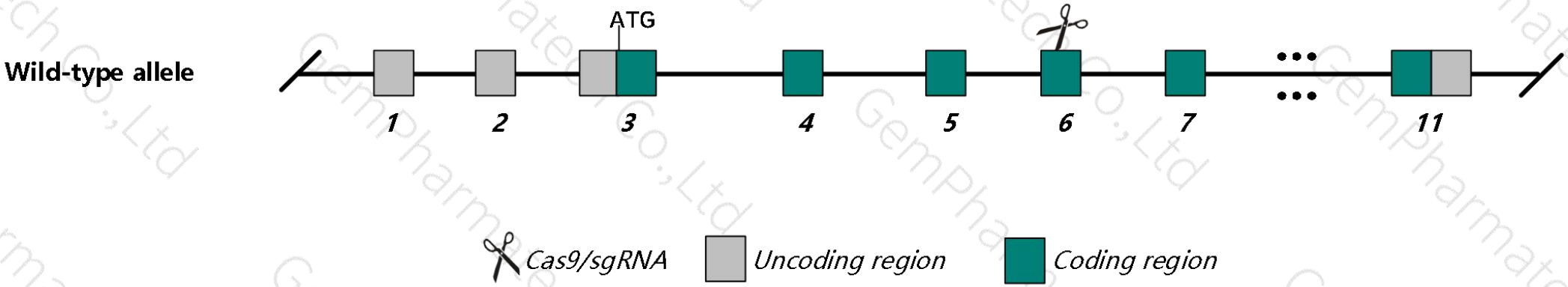
Project Overview

Project Name	***Adarb1***
Project type	**Cas9-KO**
Strain background	**C57BL/6N**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Adarb1* gene. The schematic diagram is as follows:



Technical routes

- In this project we use CRISPR/Cas9 technology to modify *Adarb1* gene. The brief process is as follows: sgRNA was transcribed in vitro.Cas9 and sgRNA were microinjected into the fertilized eggs of C57BL/6N 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/6N mice.

Notice

- According to the existing MGI data,homozygous mutation of this gene results in progressive seizure susceptibility and death within 20 days of age. Mice homozygous for a conditional allele activated in neurons exhibit motor neuron degeneration, motor function abnormalities, and premature death.

- The *Adarb1* gene is located on the Chr10. 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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Adarb1 adenosine deaminase, RNA-specific, B1 [*Mus musculus* (house mouse)]

Gene ID: 110532, updated on 24-Sep-2019

Summary

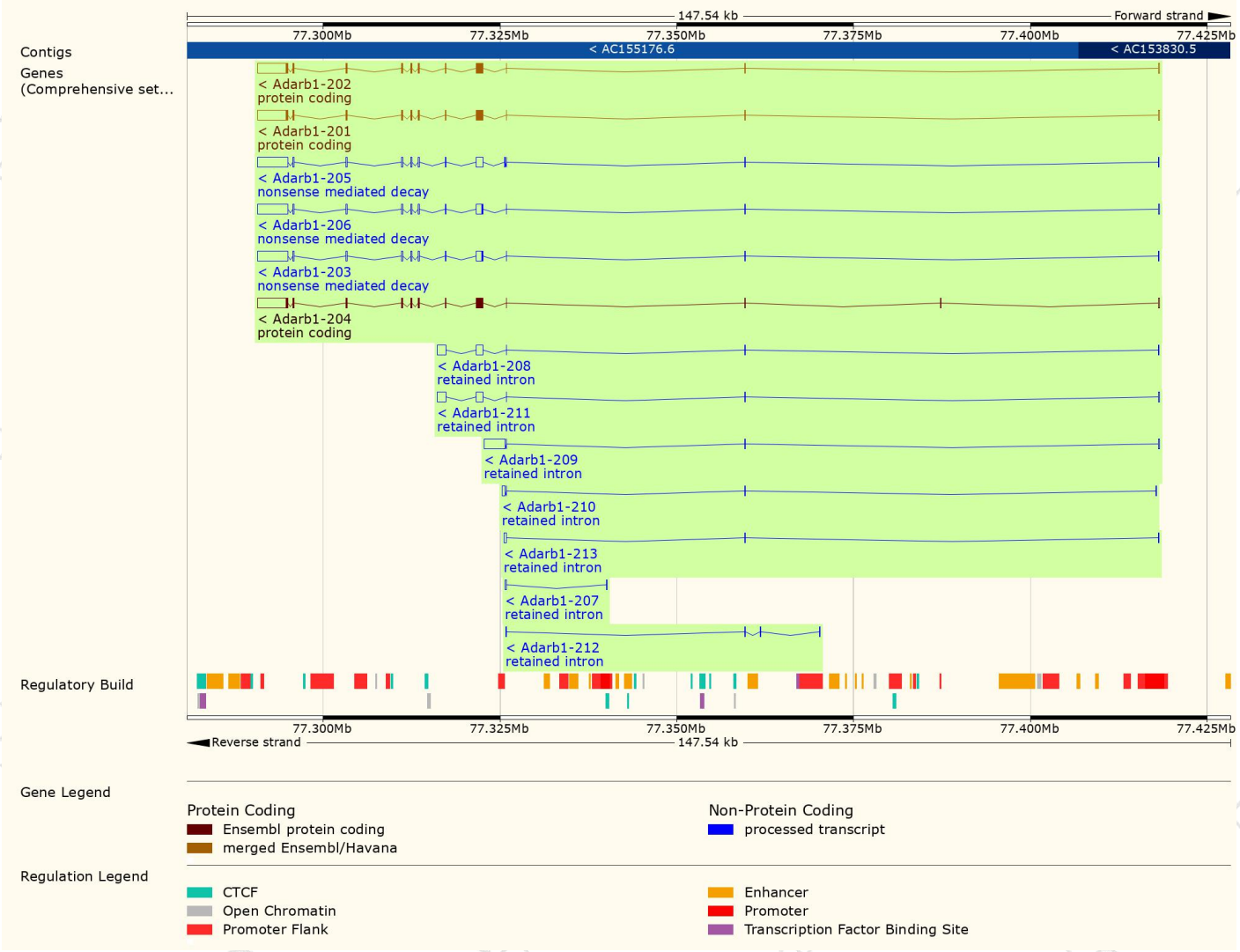
Official Symbol	Adarb1 provided by MGI
Official Full Name	adenosine deaminase, RNA-specific, B1 provided by MGI
Primary source	MGI:MGI:891999
See related	Ensembl:ENSMUSG00000020262
Gene type	protein coding
RefSeq status	REVIEWED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Red1; Adar2; AW124433; AW558573; BB220382; D10Bwg0447e; 1700057H01Rik
Summary	This gene encodes a double-stranded-RNA-specific adenosine deaminase that is involved in editing pre-mRNAs by site-specific conversion of adenosine (A) to inosine (I). Substrates for this enzyme include ionotropic glutamate receptors (GluR2-6) and serotonin receptor (5HT2C). Studies in rodents have shown that this protein can modify its own pre-mRNA by A->I editing to create a novel acceptor splice site, alternative splicing to which results in down regulation of its protein expression. Additional splicing events result in transcript variants encoding different isoforms. [provided by RefSeq, Jul 2008]
Expression	Broad expression in cerebellum adult (RPKM 24.4), frontal lobe adult (RPKM 19.8) and 18 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

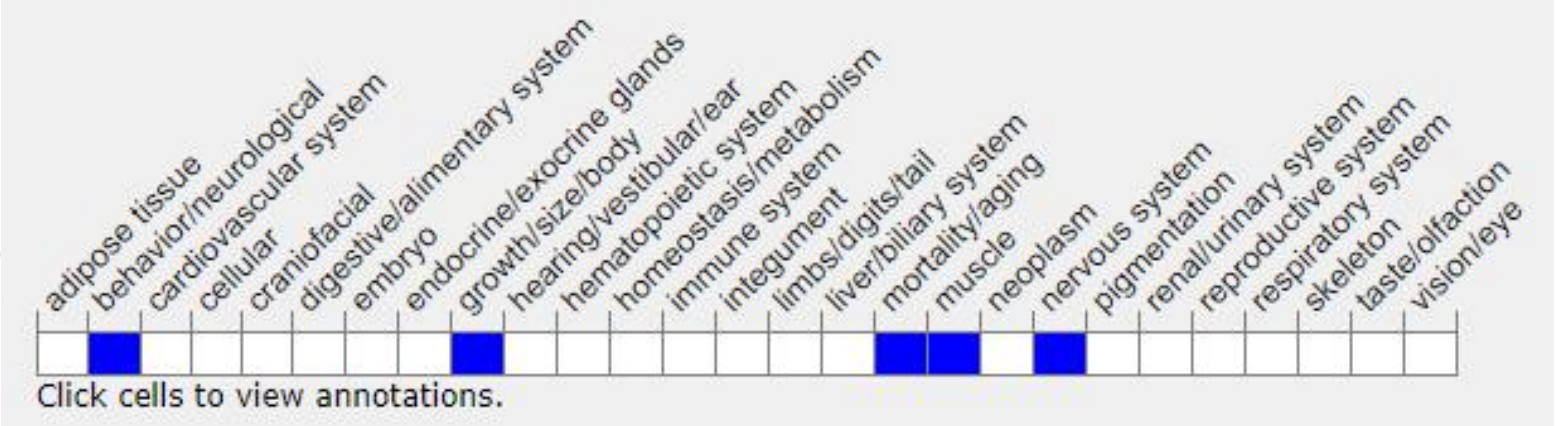
The gene has 13 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Adarb1-204	ENSMUST00000105406.7	6662	711aa	Protein coding	CCDS35948	Q91ZS8	TSL:1 GENCODE basic
Adarb1-202	ENSMUST00000098374.8	6584	711aa	Protein coding	CCDS35948	Q91ZS8	TSL:1 GENCODE basic
Adarb1-201	ENSMUST00000020496.13	6549	701aa	Protein coding	CCDS35949	Q91ZS8	TSL:1 GENCODE basic APPRIS P1
Adarb1-206	ENSMUST00000144547.7	6630	82aa	Nonsense mediated decay	-	D6RGS1	TSL:1
Adarb1-205	ENSMUST00000126073.7	6583	38aa	Nonsense mediated decay	-	D6RDS5	TSL:1
Adarb1-203	ENSMUST00000105404.8	6557	82aa	Nonsense mediated decay	-	D6RGS1	TSL:1
Adarb1-209	ENSMUST00000150227.7	3289	No protein	Retained intron	-	-	TSL:1
Adarb1-208	ENSMUST00000149738.7	2584	No protein	Retained intron	-	-	TSL:1
Adarb1-211	ENSMUST00000154607.7	2577	No protein	Retained intron	-	-	TSL:1
Adarb1-213	ENSMUST00000156583.7	704	No protein	Retained intron	-	-	TSL:1
Adarb1-210	ENSMUST00000150512.7	670	No protein	Retained intron	-	-	TSL:3
Adarb1-212	ENSMUST00000155117.1	451	No protein	Retained intron	-	-	TSL:1
Adarb1-207	ENSMUST00000146319.1	383	No protein	Retained intron	-	-	TSL:3

Genomic location distribution



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, homozygous mutation of this gene results in progressive seizure susceptibility and death within 20 days of age. Mice homozygous for a conditional allele activated in neurons exhibit motor neuron degeneration, motor function abnormalities, and premature death.

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

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