Atxn7 Cas9-KO Strategy

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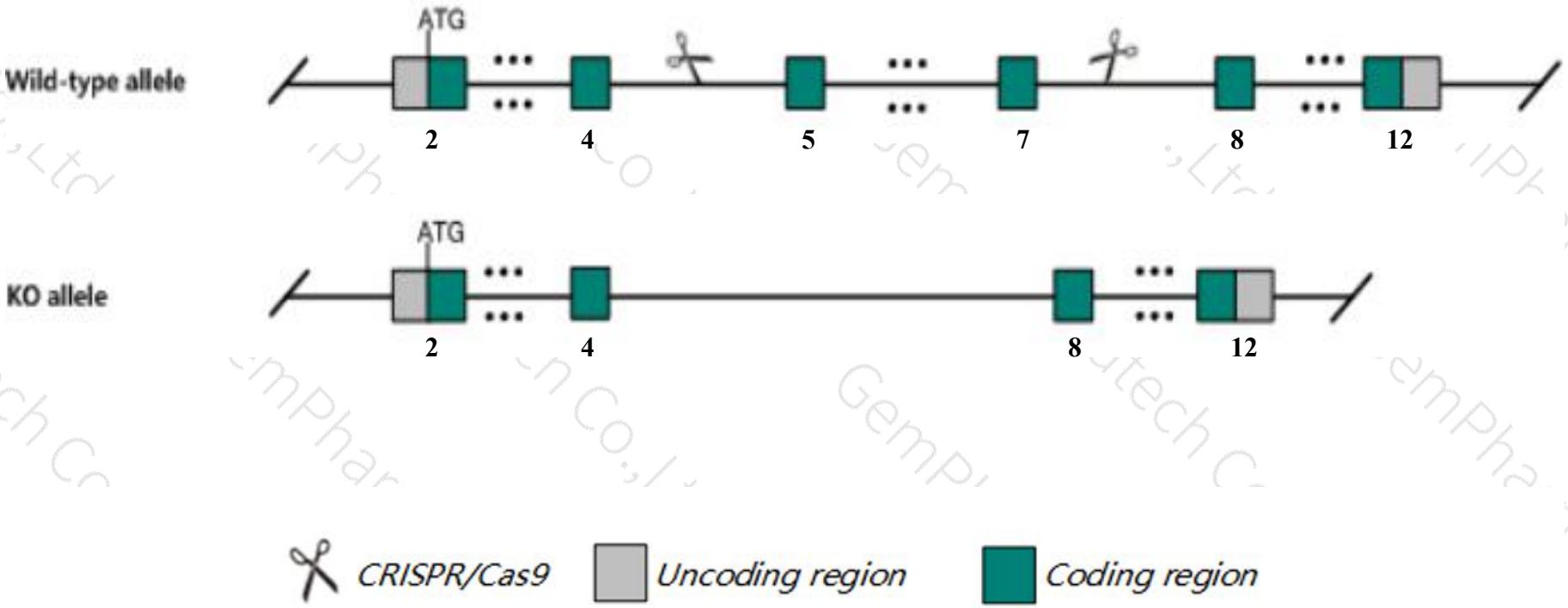
Project Overview

Project Name	***Atxn7***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Atxn7* gene. The schematic diagram is as follows:



Technical routes

➢ The *Atxn7* gene has 9 transcripts. According to the structure of *Atxn7* gene, exon5-exon7 of *Atxn7-201* (ENSMUST00000022257.3) transcript is recommended as the knockout region.The region contains 593bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Atxn7* gene. The brief process is as follows: CRISPR/Cas9 system w

Notice

- According to the existing MGI data,heterozygotes for a targeted mutation with an expanded polyglutamine tract exhibit impaired coordination, ataxia, reduced growth, kyphosis, eye defects, poor reproduction, and high mortality at around 4 months. homozygotes die at 7-8 weeks of age.
- Transcript *Atxn7-205* is incomplete, so the effect on it is unknown.
- The *Atxn7* gene is located on the Chr14. 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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Atxn7 ataxin 7 [*Mus musculus* (house mouse)]

Gene ID: 246103, updated on 12-May-2020

Summary

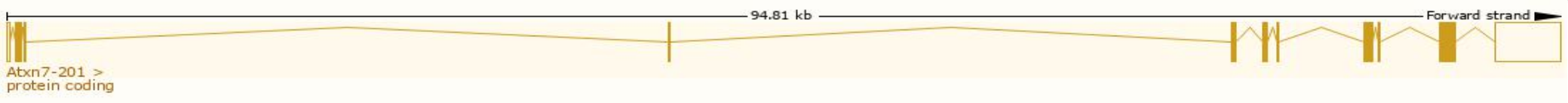
Official Symbol	Atxn7 provided by MGI
Official Full Name	ataxin 7 provided by MGI
Primary source	MGI:MGI:2179277
See related	Ensembl:ENSMUSG00000021738
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Sca7; AI627028; ataxin-7; A430107N12Rik
Expression	Ubiquitous expression in lung adult (RPKM 4.5), bladder adult (RPKM 4.4) and 28 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

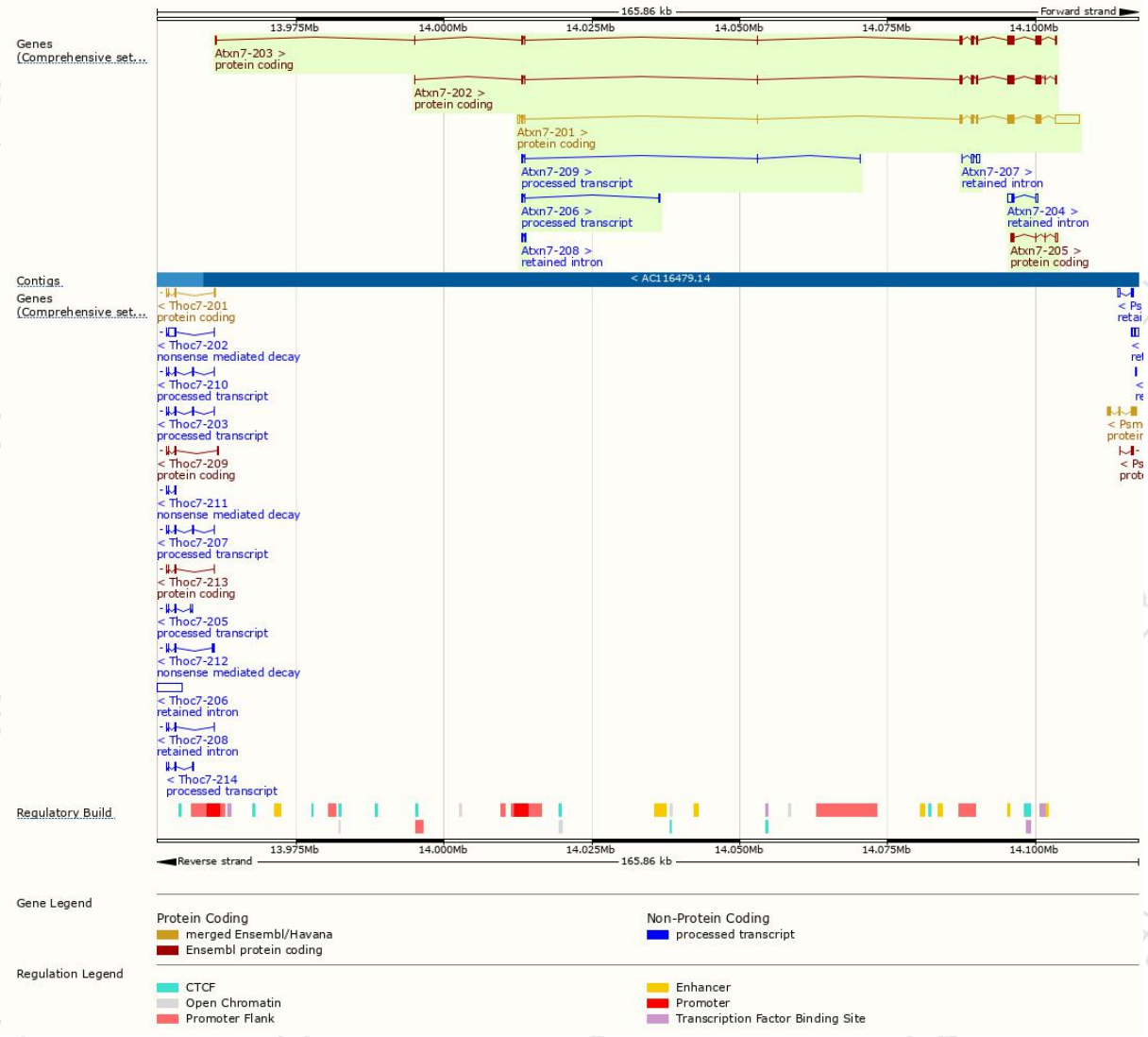
The gene has 9 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Atxn7-201	ENSMUST00000022257.3	6853	867aa	Protein coding	CCDS26823	Q8R4I1	TSL:1 GENCODE basic APPRIS P2
Atxn7-203	ENSMUST00000223880.1	2946	867aa	Protein coding	CCDS26823	Q8R4I1	GENCODE basic APPRIS P2
Atxn7-202	ENSMUST00000223714.1	2954	920aa	Protein coding	-	A0A286YDW9	GENCODE basic APPRIS ALT2
Atxn7-205	ENSMUST00000224315.1	779	106aa	Protein coding	-	A0A286YCL5	CDS 5' incomplete
Atxn7-209	ENSMUST00000226073.1	492	No protein	Processed transcript	-	-	-
Atxn7-206	ENSMUST00000224370.1	392	No protein	Processed transcript	-	-	-
Atxn7-204	ENSMUST00000223932.1	1081	No protein	Retained intron	-	-	-
Atxn7-207	ENSMUST00000224616.1	766	No protein	Retained intron	-	-	-
Atxn7-208	ENSMUST00000225164.1	534	No protein	Retained intron	-	-	-

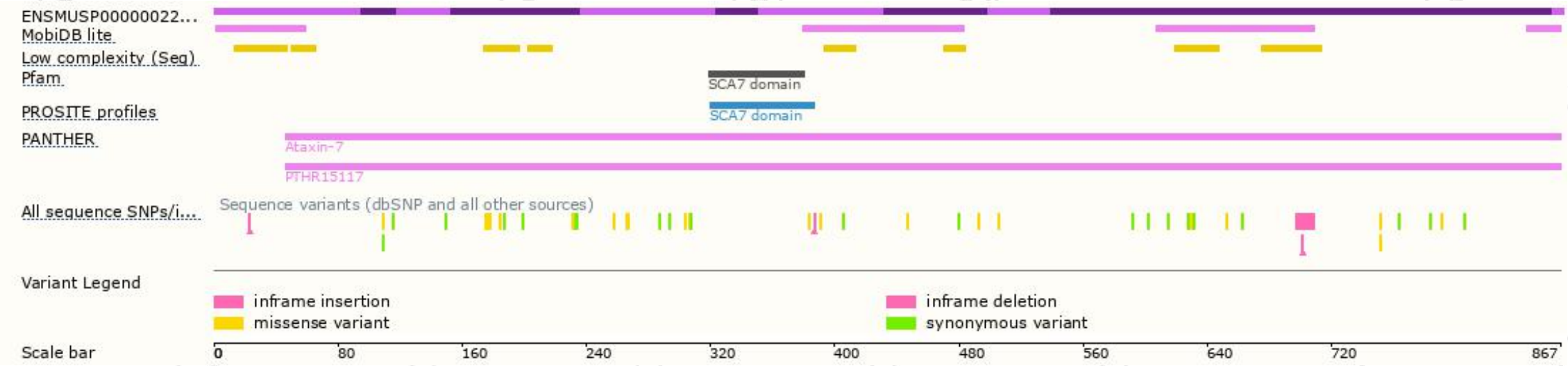
The strategy is based on the design of *Atxn7-201* transcript,the transcription is shown below:



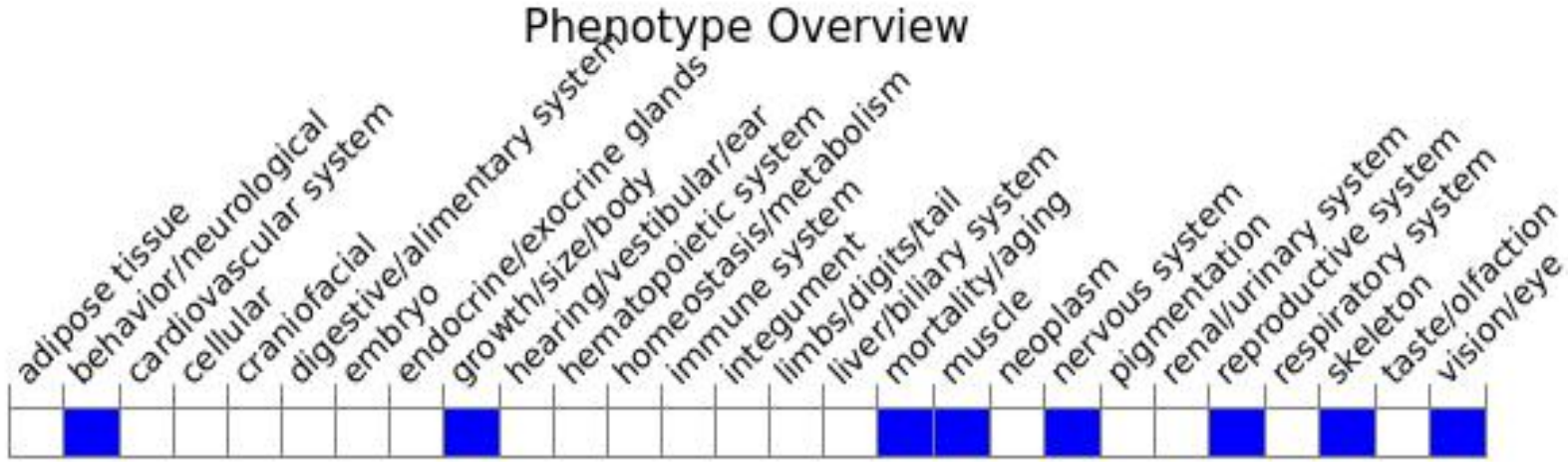
Genomic location distribution



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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