

# *Atad1* Cas9-KO Strategy

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**Reviewer:**

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# Project Overview

**Project Name**

*Atad1*

**Project type**

**Cas9-KO**

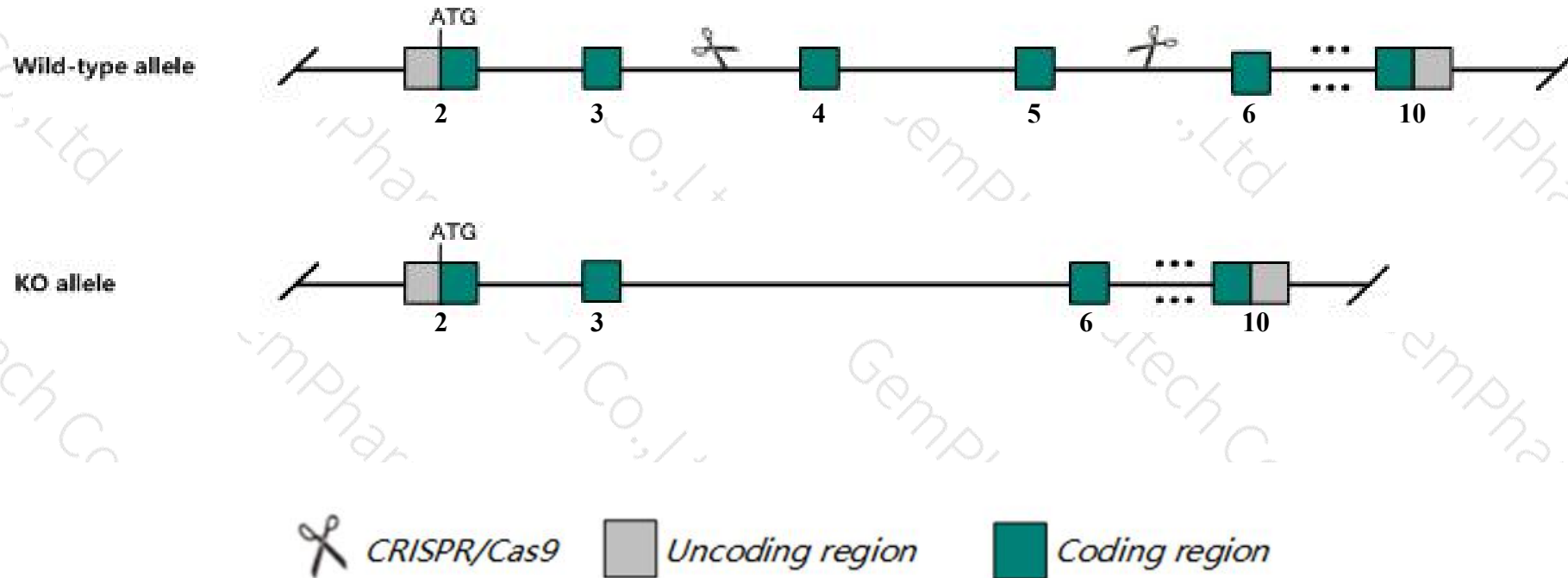
**Strain background**

**C57BL/6JGpt**



# Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Atad1* gene. The schematic diagram is as follows:





- The *Atad1* gene has 10 transcripts. According to the structure of *Atad1* gene, exon4-exon5 of *Atad1-201* (ENSMUST00000070210.5) transcript is recommended as the knockout region. The region contains 322bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Atad1* gene. The brief process is as follows: CRISPR/Cas9 system



- According to the existing MGI data, Mice homozygous for a knock-out allele exhibit decreased body size, seizure, absent LTD, enhanced LTP, enhanced AMPA-mediated currents, and premature death.
- The *Atad1* gene is located on the Chr19. 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)

## Atad1 ATPase family, AAA domain containing 1 [Mus musculus (house mouse)]

Gene ID: 67979, updated on 19-Mar-2019

### Summary



<b>Official Symbol</b>	Atad1 provided by <a href="#">MGI</a>
<b>Official Full Name</b>	ATPase family, AAA domain containing 1 provided by <a href="#">MGI</a>
<b>Primary source</b>	<a href="#">MGI:MGI:1915229</a>
<b>See related</b>	<a href="#">Ensembl:ENSMUSG00000013662</a>
<b>Gene type</b>	protein coding
<b>RefSeq status</b>	VALIDATED
<b>Organism</b>	<a href="#">Mus musculus</a>
<b>Lineage</b>	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
<b>Also known as</b>	4921525H23Rik, AW107648, Thorase
<b>Expression</b>	Broad expression in CNS E18 (RPKM 23.5), CNS E14 (RPKM 20.1) and 24 other tissues <a href="#">See more</a>
<b>Orthologs</b>	<a href="#">human</a> <a href="#">all</a>

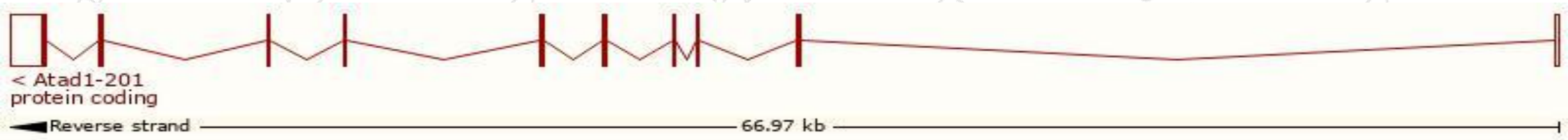


# Transcript information (Ensembl)

The gene has 10 transcripts,all transcripts are shown below:

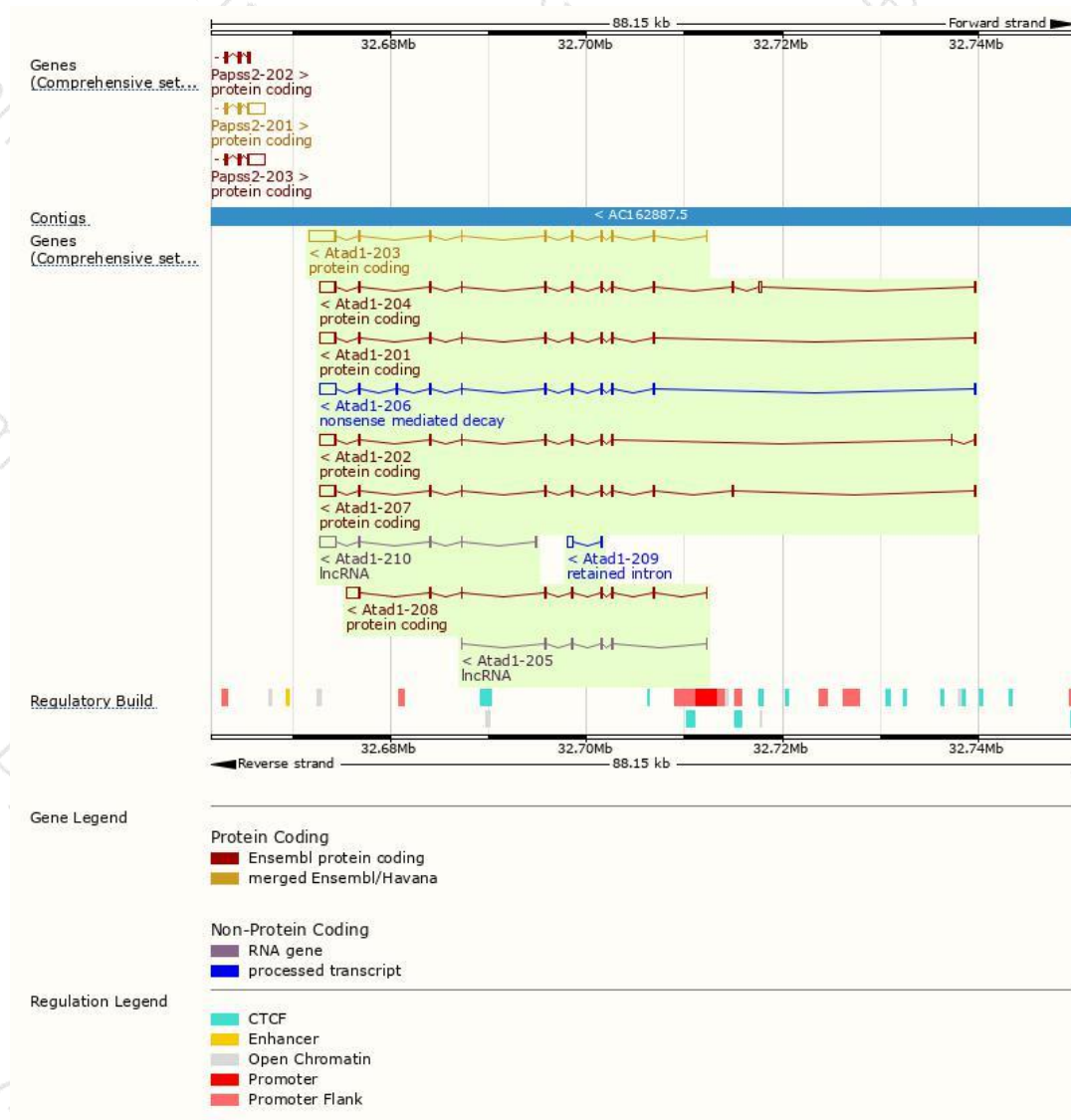
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Atad1-203	<a href="#">ENSMUST00000235412.1</a>	3771	<a href="#">361aa</a>	Protein coding	<a href="#">CCDS29752</a>	-	GENCODE basic APPRIS P1
Atad1-204	<a href="#">ENSMUST00000236011.1</a>	2943	<a href="#">361aa</a>	Protein coding	<a href="#">CCDS29752</a>	-	GENCODE basic APPRIS P1
Atad1-207	<a href="#">ENSMUST00000236985.1</a>	2722	<a href="#">361aa</a>	Protein coding	<a href="#">CCDS29752</a>	-	GENCODE basic APPRIS P1
Atad1-201	<a href="#">ENSMUST00000070210.5</a>	2666	<a href="#">361aa</a>	Protein coding	<a href="#">CCDS29752</a>	<a href="#">Q9D5T0</a>	TSL:1 GENCODE basic APPRIS P1
Atad1-202	<a href="#">ENSMUST00000235142.1</a>	2535	<a href="#">276aa</a>	Protein coding	-	-	GENCODE basic
Atad1-208	<a href="#">ENSMUST00000237752.1</a>	2269	<a href="#">322aa</a>	Protein coding	-	-	GENCODE basic
Atad1-206	<a href="#">ENSMUST00000236701.1</a>	2736	<a href="#">303aa</a>	Nonsense mediated decay	-	-	
Atad1-209	<a href="#">ENSMUST00000237933.1</a>	611	No protein	Retained intron	-	-	
Atad1-210	<a href="#">ENSMUST00000238016.1</a>	1905	No protein	lncRNA	-	-	
Atad1-205	<a href="#">ENSMUST00000236546.1</a>	624	No protein	lncRNA	-	-	

The strategy is based on the design of *Atad1-201* transcript,The transcription is shown below



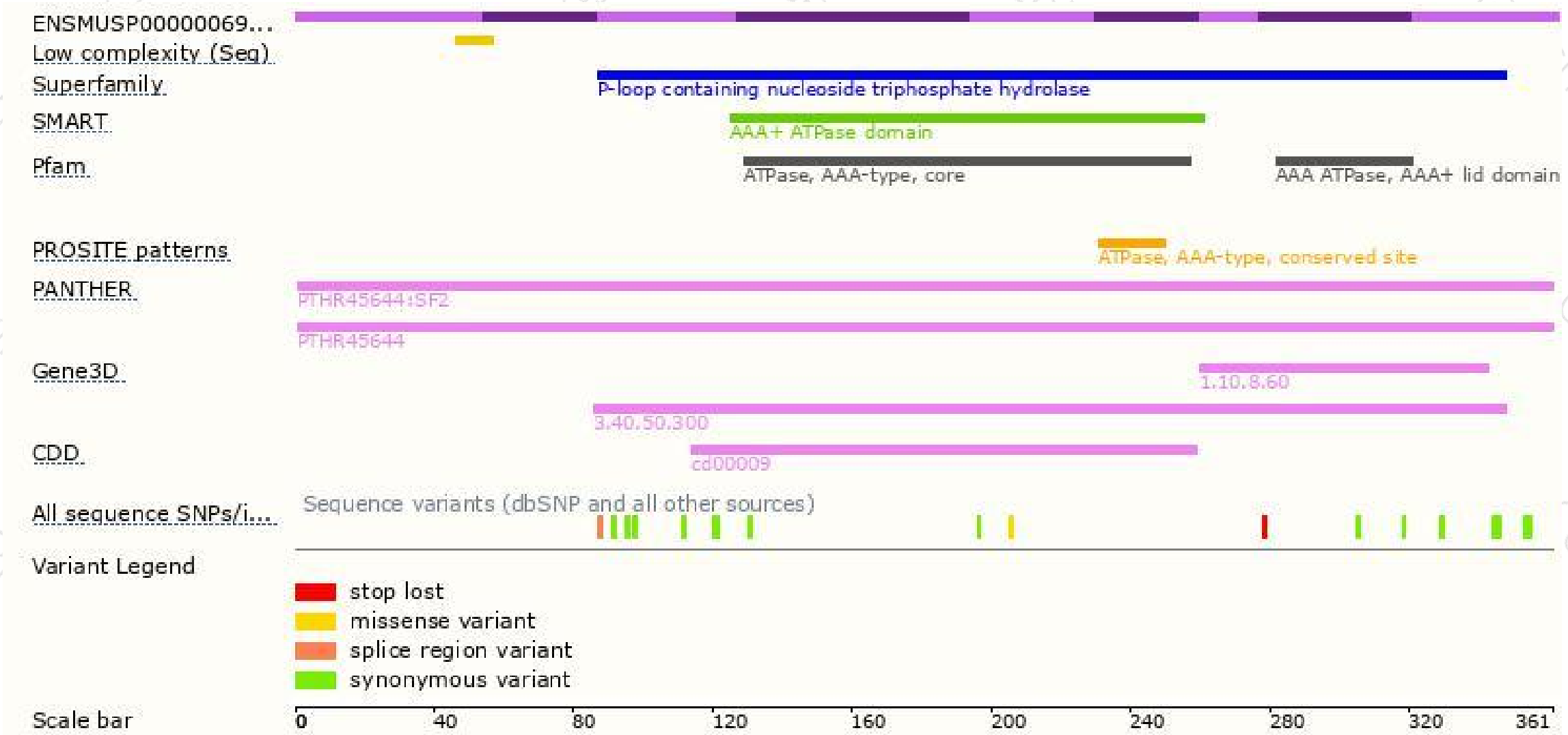


# Genomic location distribution



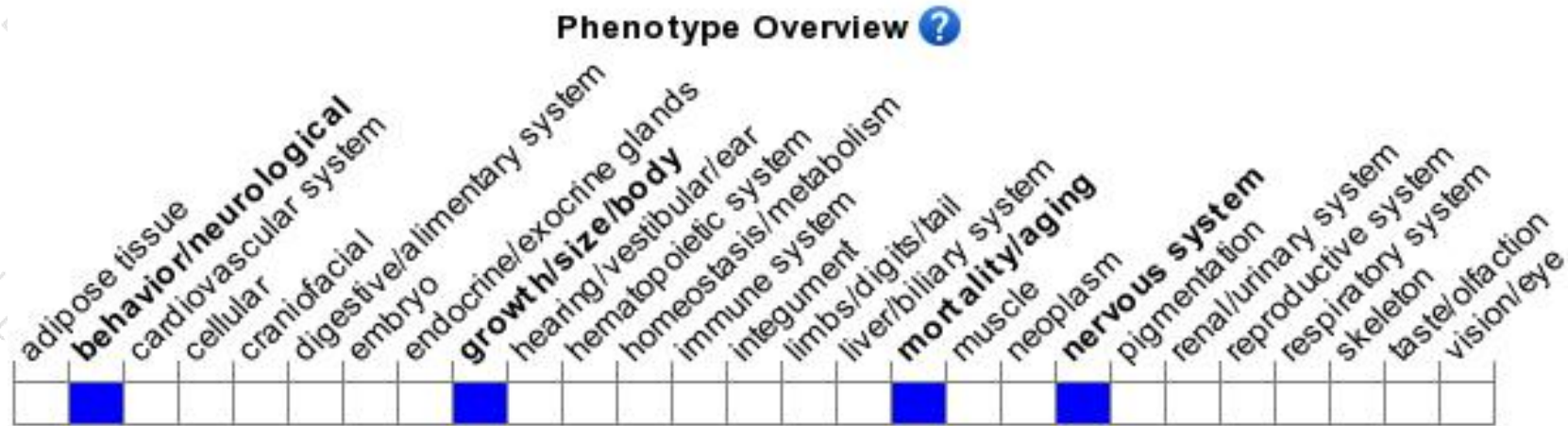


# Protein domain





# 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 decreased body size, seizure, absent LTD, enhanced LTP, enhanced AMPA-mediated currents, and premature death.



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

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