

# *Abca7* Cas9-KO Strategy

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**Reviewer:**

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# Project Overview

**Project Name**

*Abca7*

**Project type**

**Cas9-KO**

**Strain background**

**C57BL/6JGpt**

# Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Abca7* gene. The schematic diagram is as follows:



- The *Abca7* gene has 3 transcripts. According to the structure of *Abca7* gene, exon10-exon35 of *Abca7-202* (ENSMUST00000132517.7) transcript is recommended as the knockout region. The region contains 4001bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Abca7* gene. The brief process is as follows: CRISPR/Cas9 system

- According to the existing MGI data, Homozygous mutant females, but not males, have less white fat and lower total serum and HDL cholesterol levels. Males exhibit a 10% reduction in kidney size.
- The *Abca7* 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)

## Abca7 ATP-binding cassette, sub-family A (ABC1), member 7 [Mus musculus (house mouse)]

Gene ID: 27403, updated on 3-Feb-2019

### Summary



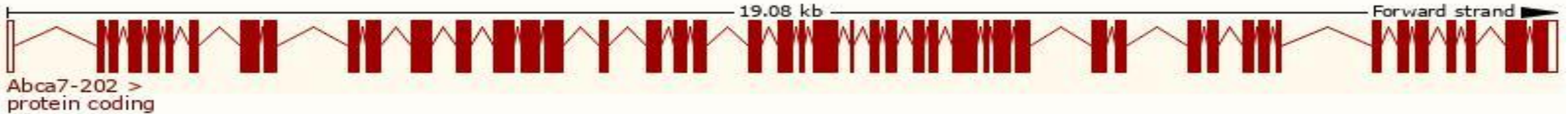
<b>Official Symbol</b>	Abca7 provided by <a href="#">MGI</a>
<b>Official Full Name</b>	ATP-binding cassette, sub-family A (ABC1), member 7 provided by <a href="#">MGI</a>
<b>Primary source</b>	<a href="#">MGI:MGI:1351646</a>
<b>See related</b>	<a href="#">Ensembl:ENSMUSG00000035722</a>
<b>Gene type</b>	protein coding
<b>RefSeq status</b>	REVIEWED
<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>	ABCX, Abc51
<b>Summary</b>	The protein encoded by this gene is a member of the superfamily of ATP-binding cassette (ABC) transporters. ABC proteins transport various molecules across extra- and intracellular membranes. ABC genes are divided into seven distinct subfamilies (ABC1, MDR/TAP, MRP, ALD, OABP, GCN20, White). This protein is a member of the ABC1 subfamily. Members of the ABC1 subfamily comprise the only major ABC subfamily found exclusively in multicellular eukaryotes. This protein is widely expressed with highest detection in spleen and hematopoietic tissues. Defects in this gene cause an increase in amyloid-beta deposits in a mouse model of Alzheimer's disease, and a related human protein is thought to play a role in lipid homeostasis in cells of the immune system. [provided by RefSeq, Jan 2017]
<b>Expression</b>	Ubiquitous expression in spleen adult (RPKM 30.2), thymus adult (RPKM 29.6) and 26 other tissues <a href="#">See more</a>
<b>Orthologs</b>	<a href="#">human</a> <a href="#">all</a>

# Transcript information (Ensembl)

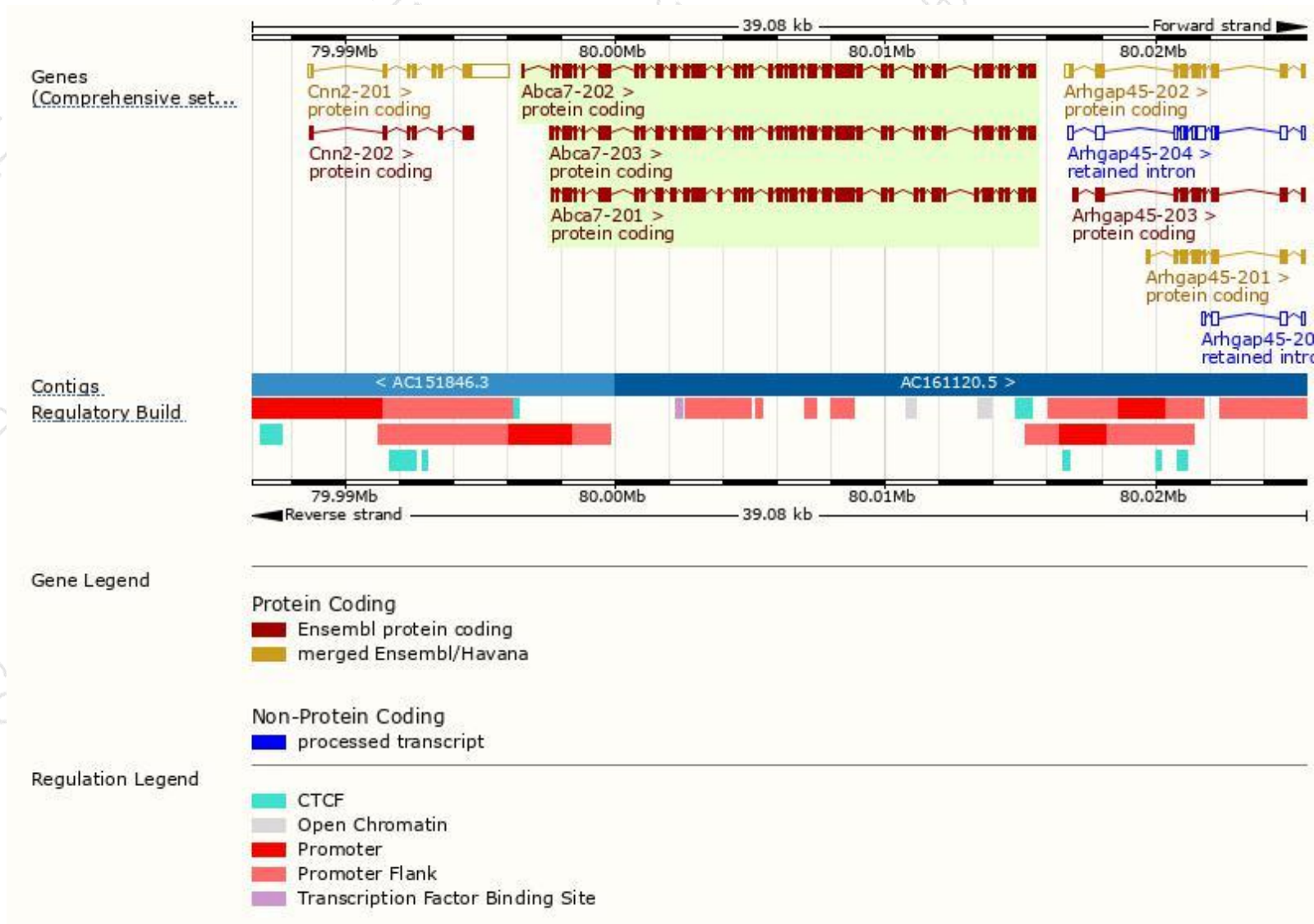
The gene has 3 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Abca7-202	<a href="#">ENSMUST00000132517.7</a>	6696	<a href="#">2159aa</a>	Protein coding	<a href="#">CCDS24004</a>	<a href="#">Q91V24</a>	TSL:5 GENCODE basic APPRIS P3
Abca7-203	<a href="#">ENSMUST00000171637.7</a>	6638	<a href="#">2167aa</a>	Protein coding	<a href="#">CCDS83724</a>	<a href="#">E9Q6G4</a>	TSL:1 GENCODE basic APPRIS ALT2
Abca7-201	<a href="#">ENSMUST00000043866.7</a>	6590	<a href="#">2159aa</a>	Protein coding	<a href="#">CCDS24004</a>	<a href="#">Q91V24</a>	TSL:1 GENCODE basic APPRIS P3

The strategy is based on the design of *Abca7-202* transcript,The transcription is shown below

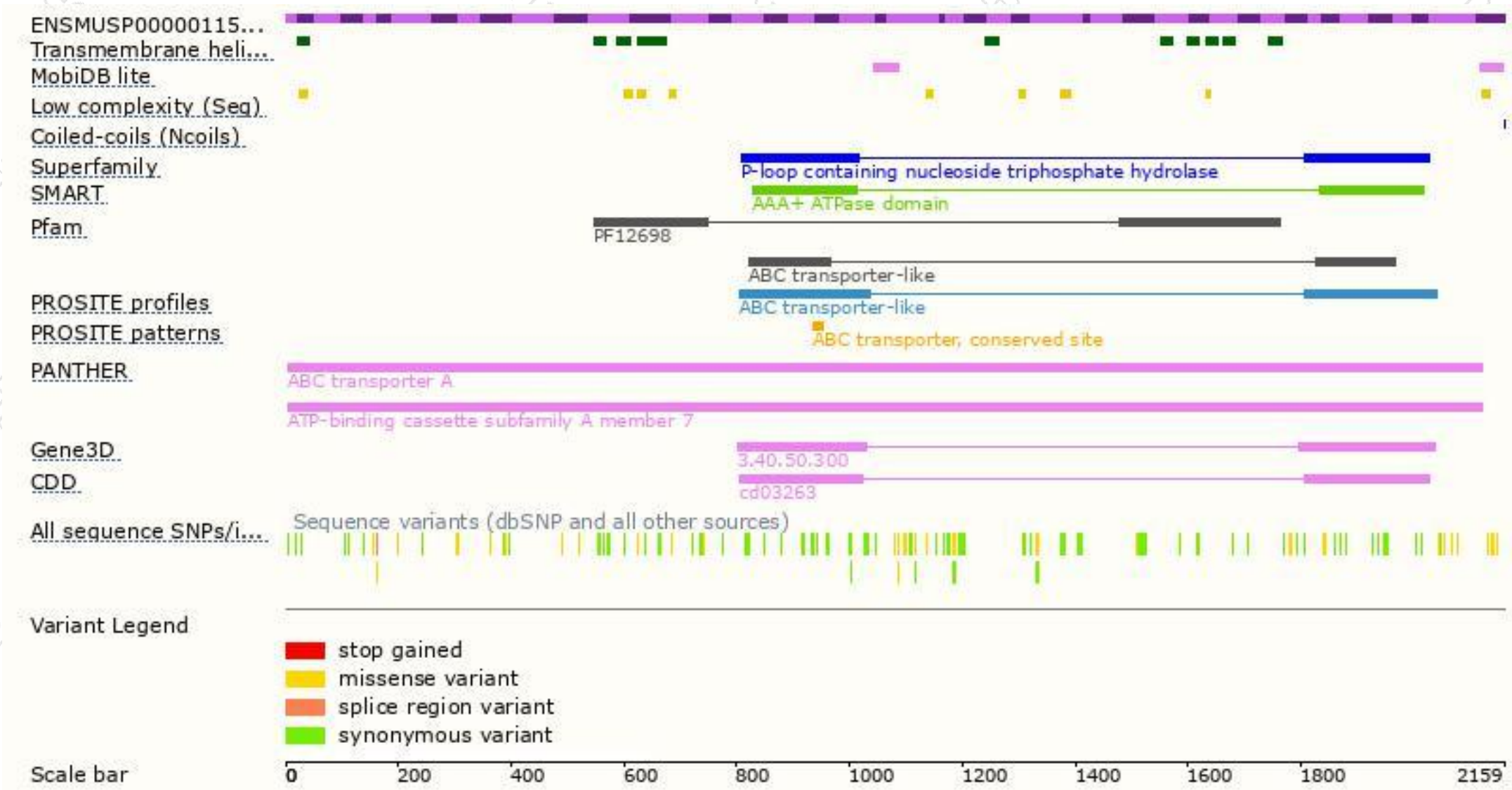


# Genomic location distribution

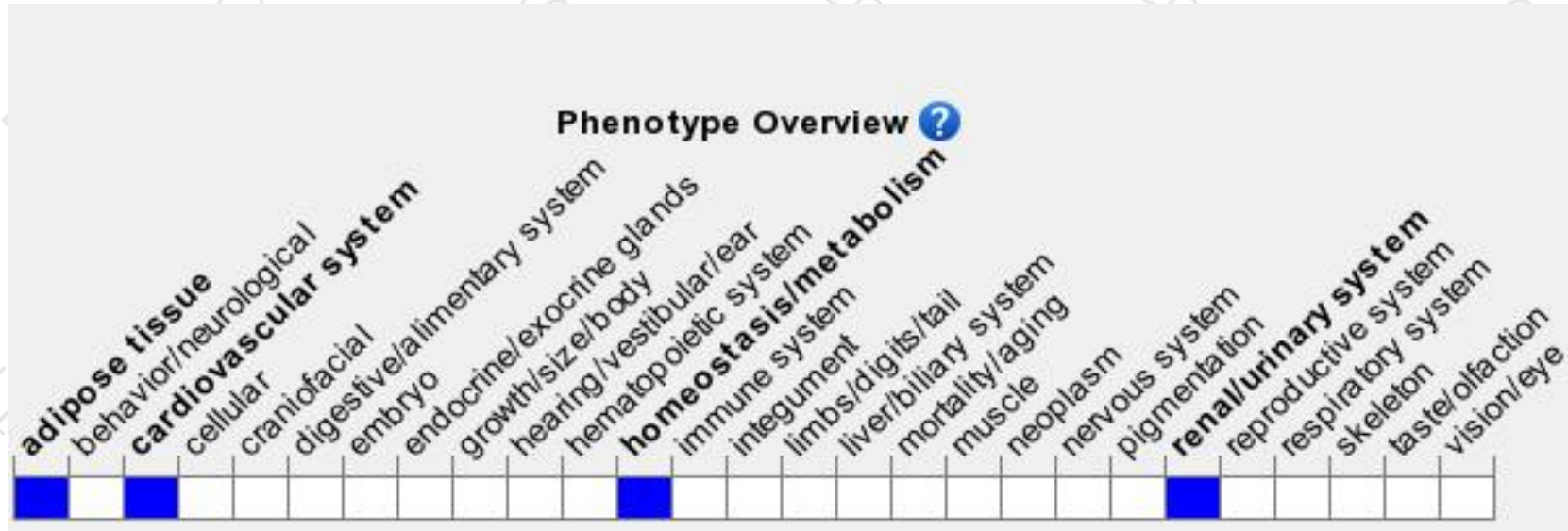




# Protein domain



# 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, Homozygous mutant females, but not males, have less white fat and lower total serum and HDL cholesterol levels. Males exhibit a 10% reduction in kidney size.

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

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