

# *Abraxas1* Cas9-KO Strategy

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**Reviewer: Daohua Xu**

**Design Date: 2020-7-14**

# Project Overview

**Project Name**

*Abraxas1*

**Project type**

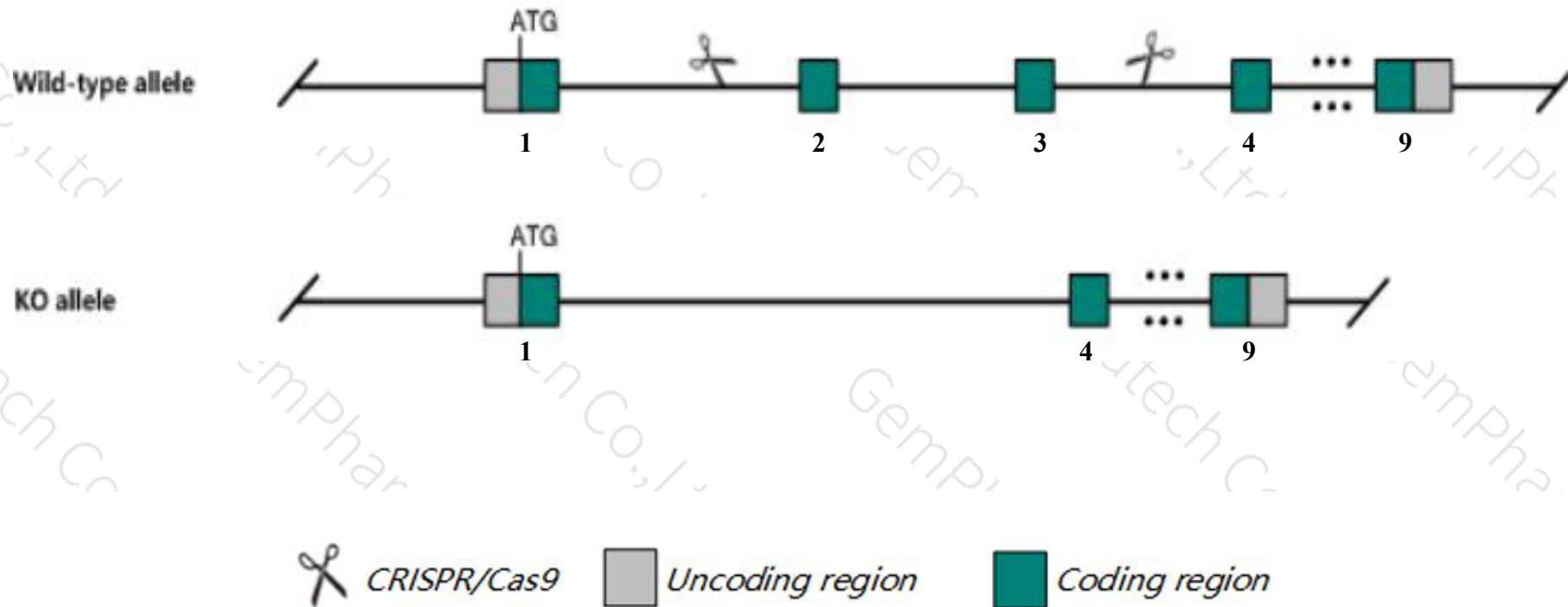
**Cas9-KO**

**Strain background**

**C57BL/6JGpt**

# Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Abraxas1* gene. The schematic diagram is as follows:



- The *Abraxas1* gene has 9 transcripts. According to the structure of *Abraxas1* gene, exon2-exon3 of *Abraxas1*-202(ENSMUST00000055245.12) transcript is recommended as the knockout region. The region contains 128bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Abraxas1* gene. The brief process is as follows: CRISPR/Cas9 system were microinjected into the fertilized eggs of C57BL/6JGpt 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/6JGpt mice.

- According to the existing MGI data, mice homozygous for a knock-out allele exhibit increased tumor incidence, genetic instability and premature lethality. Mice heterozygous for a knock-out allele exhibit increased tumor incidence and premature death.
- Transcript *Abraxas1*-206 may not be affected.
- The knockout region is near to the N-terminal of *Gm43513* gene and C-terminal of *Gm43514* gene, this strategy may influence the regulatory function of the N-terminal of *Gm43513* gene and C-terminal of *Gm43514* gene.
- The *Abraxas1* gene is located on the Chr5. 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)

Abraxas1 BRCA1 A complex subunit [Mus musculus (house mouse)]

Gene ID: 70681, updated on 13-Mar-2020

## Summary



Official Symbol [Abraxas1](#) provided by [MGI](#)

Official Full Name [BRCA1 A complex subunit](#) provided by [MGI](#)

Primary source [MGI:MGI:1917931](#)

See related [Ensembl:ENSMUSG00000035234](#)

Gene type protein coding

RefSeq status PROVISIONAL

Organism [Mus musculus](#)

Lineage Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus

Also known as [3830405G04Rik](#), [5630400M01Rik](#), [AI506069](#), [AL024423](#), [AV118690](#), [Ccgc98](#), [Fam175a](#)

Expression Ubiquitous expression in liver E14 (RPKM 4.3), placenta adult (RPKM 4.0) and 28 other tissues [See more](#)

Orthologs [human](#) [all](#)

# Transcript information (Ensembl)

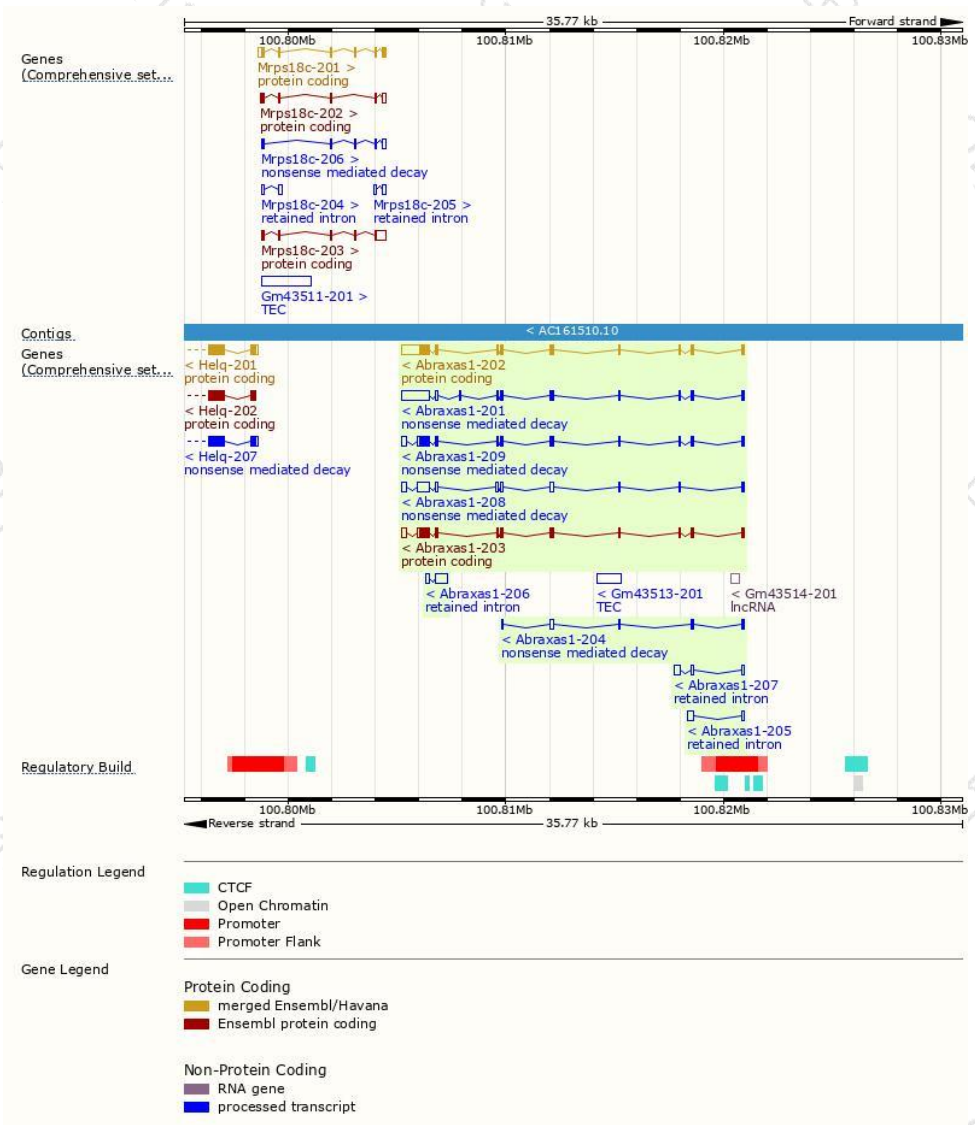
The gene has 9 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Abraxas1-202	<a href="#">ENSMUST00000055245.12</a>	2139	<a href="#">407aa</a>	Protein coding	<a href="#">CCDS19469</a>	<a href="#">Q8BPZ8</a>	TSL:1 GENCODE basic APPRIS P1
Abraxas1-203	<a href="#">ENSMUST00000117364.7</a>	1657	<a href="#">407aa</a>	Protein coding	<a href="#">CCDS19469</a>	<a href="#">Q8BPZ8</a>	TSL:1 GENCODE basic APPRIS P1
Abraxas1-201	<a href="#">ENSMUST00000044535.13</a>	2182	<a href="#">261aa</a>	Nonsense mediated decay	-	<a href="#">Q8BPZ8</a>	TSL:1
Abraxas1-209	<a href="#">ENSMUST00000200657.4</a>	1668	<a href="#">407aa</a>	Nonsense mediated decay	-	<a href="#">Q8BPZ8</a>	TSL:1
Abraxas1-208	<a href="#">ENSMUST00000153302.7</a>	1582	<a href="#">46aa</a>	Nonsense mediated decay	-	<a href="#">D6RHB0</a>	TSL:1
Abraxas1-204	<a href="#">ENSMUST00000129358.1</a>	545	<a href="#">64aa</a>	Nonsense mediated decay	-	<a href="#">D6RFD4</a>	TSL:3
Abraxas1-206	<a href="#">ENSMUST00000145429.1</a>	701	No protein	Retained intron	-	-	TSL:2
Abraxas1-207	<a href="#">ENSMUST00000145707.1</a>	454	No protein	Retained intron	-	-	TSL:2
Abraxas1-205	<a href="#">ENSMUST00000131857.1</a>	358	No protein	Retained intron	-	-	TSL:3

The strategy is based on the design of *Abraxas1-202* transcript,the transcription is shown below:

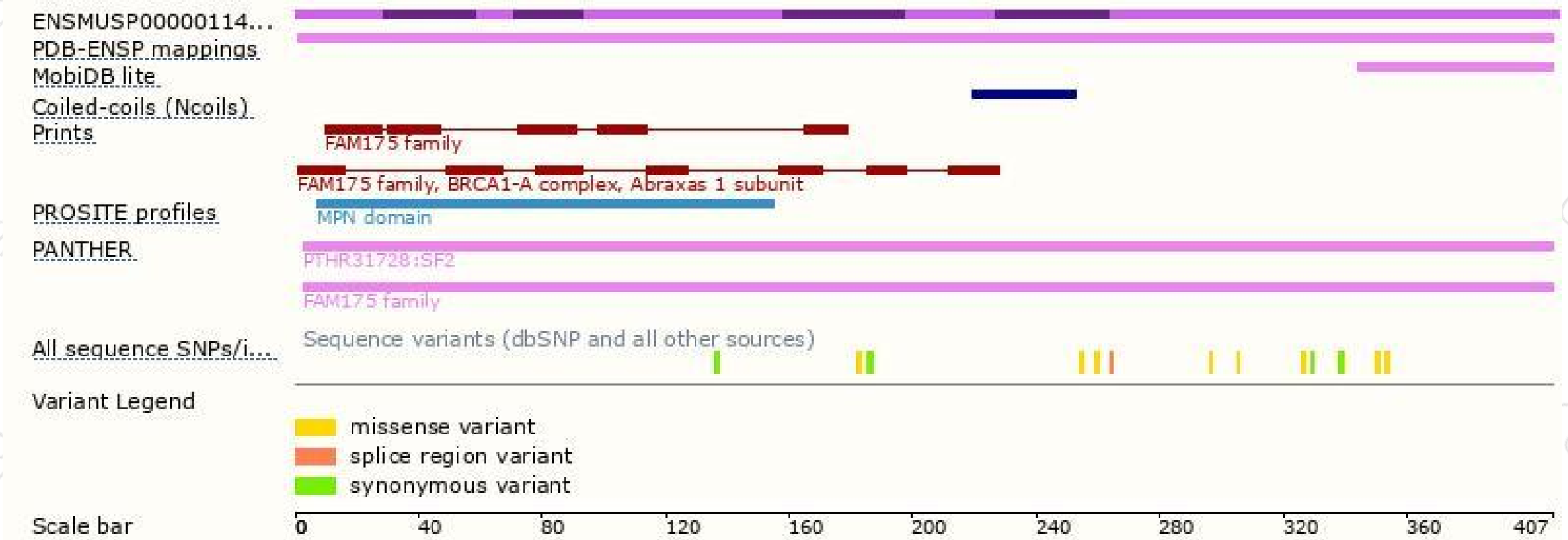


# Genomic location distribution

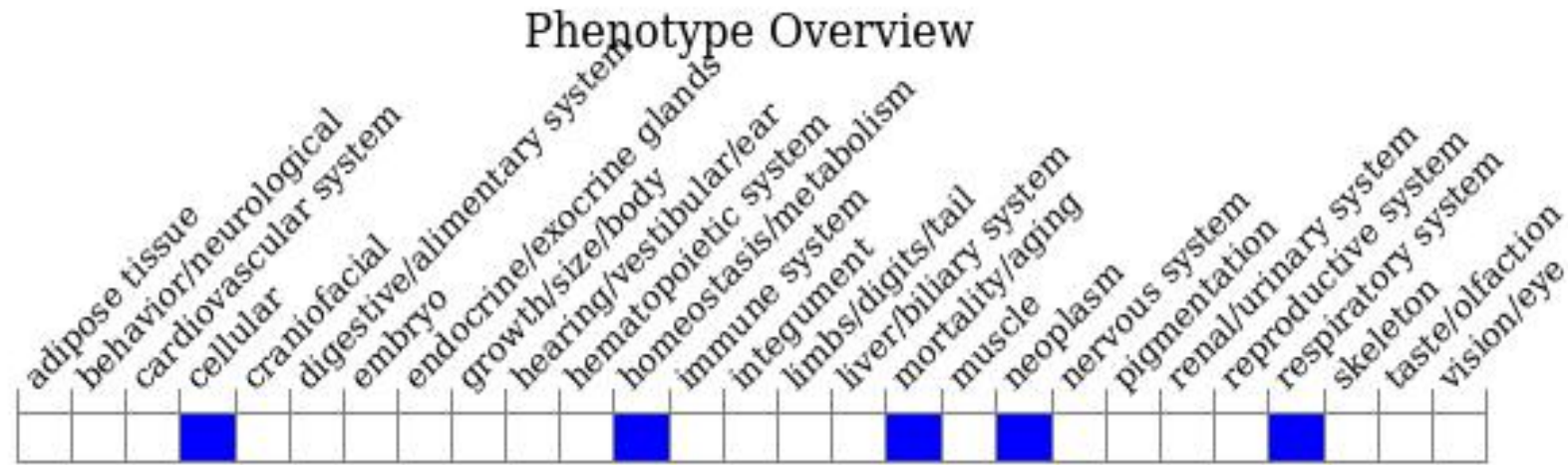




# Protein domain



# 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, mice homozygous for a knock-out allele exhibit increased tumor incidence, genetic instability and premature lethality. Mice heterozygous for a knock-out allele exhibit increased tumor incidence and premature death.

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

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