

# ***Brca2* Cas9-KO Strategy**

**Designer:**

**Jinling Wang**

**Design Date:**

**2019-7-19**

# Project Overview

**Project Name**

***Brca2***

**Project type**

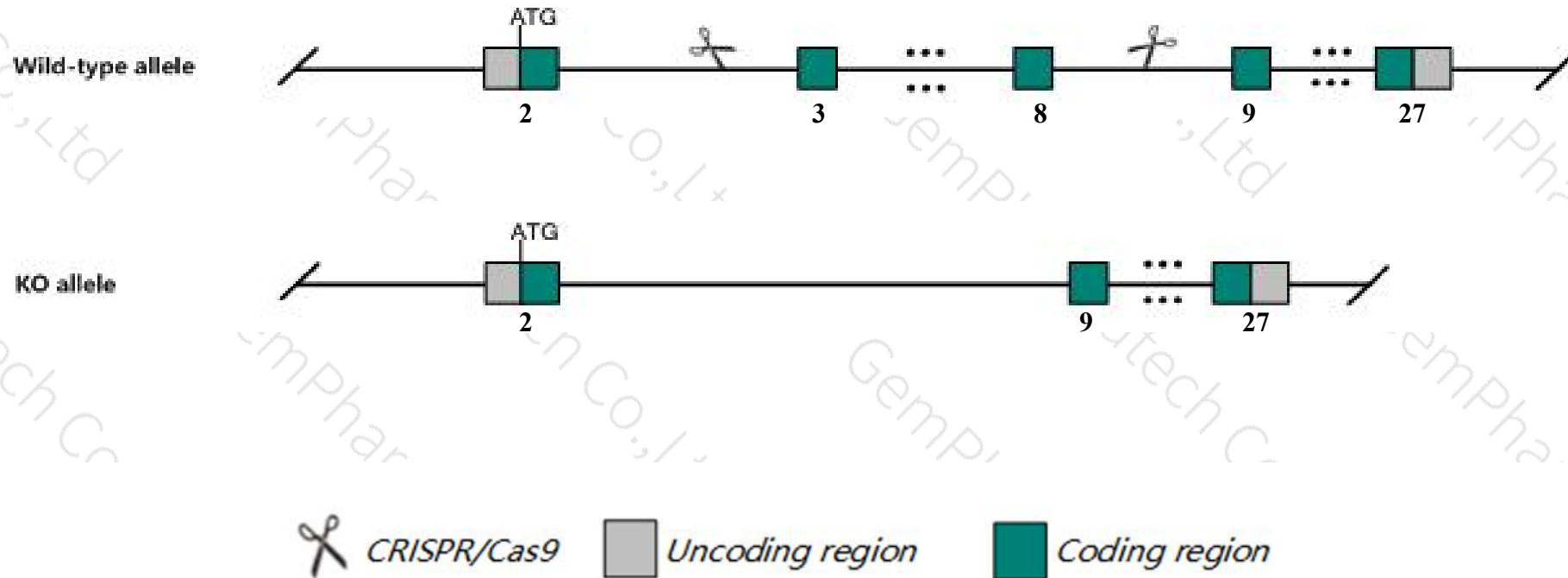
**Cas9-KO**

**Strain background**

**C57BL/6JGpt**

# Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Brca2* gene. The schematic diagram is as follows:



- The *Brca2* gene has 14 transcripts. According to the structure of *Brca2* gene, exon3-exon8 of *Brca2-201* (ENSMUST00000044620.10) transcript is recommended as the knockout region. The region contains 590bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Brca2* gene. The brief process is as follows: CRISPR/Cas9 system

- According to the existing MGI data, Homozygous null mutants are embryonic lethal with abnormalities including growth retardation, neural tube defects, and mesoderm abnormalities; conditional mutations cause genetic instability and enhanced tumor formation; mutants with truncated BRCA2 protein survive, are small, infertile, show improper tissue differentiation and develop lymphomas and carcinomas.
- The *Brca2* 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)

## Brca2 breast cancer 2, early onset [Mus musculus (house mouse)]

Gene ID: 12190, updated on 9-Apr-2019

### Summary



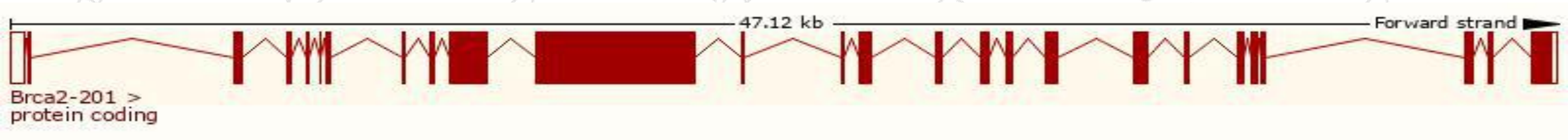
<b>Official Symbol</b>	Brca2 provided by <a href="#">MGI</a>
<b>Official Full Name</b>	breast cancer 2, early onset provided by <a href="#">MGI</a>
<b>Primary source</b>	<a href="#">MGI:MGI:109337</a>
<b>See related</b>	<a href="#">Ensembl:ENSMUSG00000041147</a>
<b>Gene type</b>	protein coding
<b>RefSeq 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>	Fancd1, RAB163
<b>Expression</b>	Broad expression in CNS E11.5 (RPKM 2.0), liver E14 (RPKM 1.6) and 24 other tissues <a href="#">See more</a>
<b>Orthologs</b>	<a href="#">human</a> <a href="#">all</a>

# Transcript information (Ensembl)

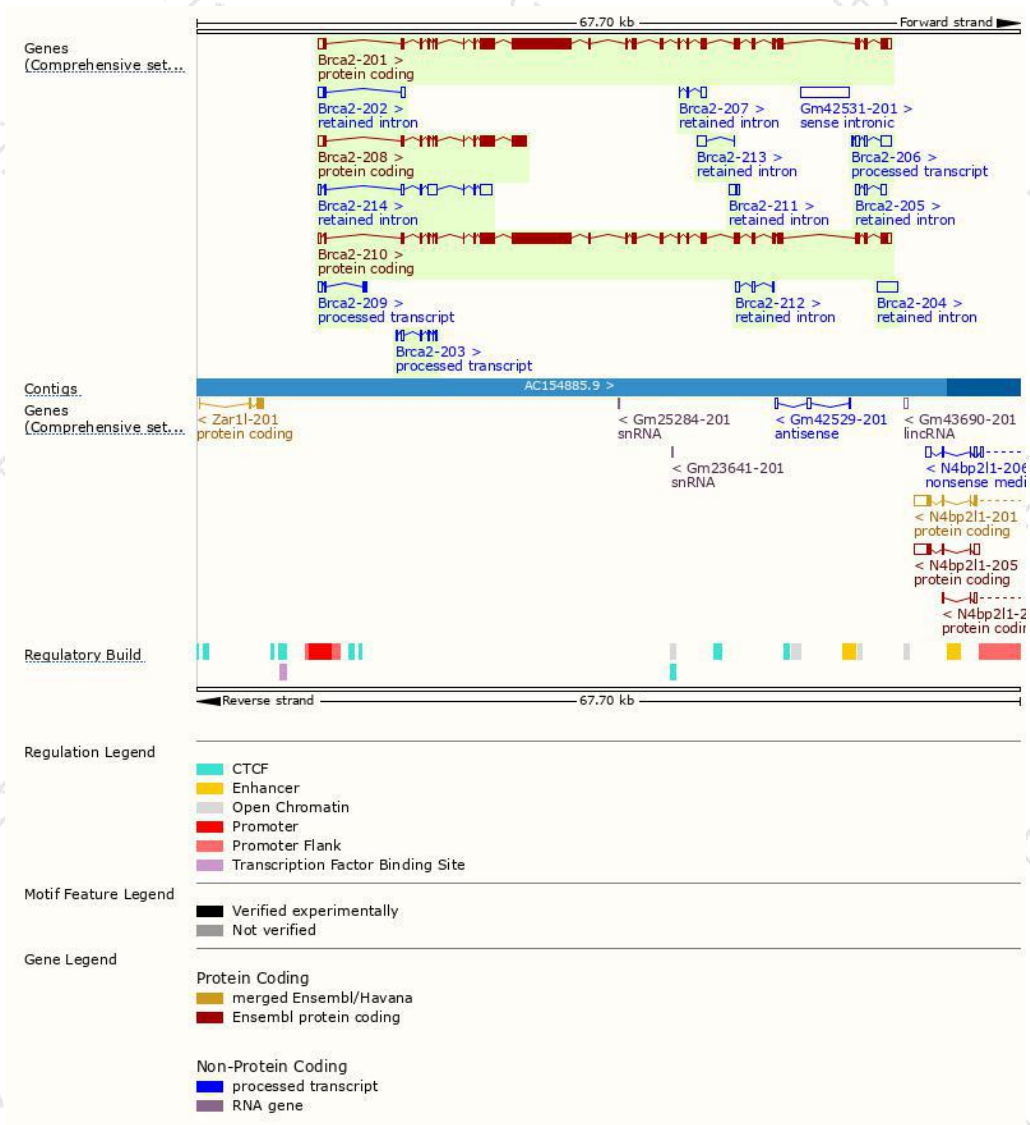
The gene has 14 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Brca2-201	<a href="#">ENSMUST00000044620.10</a>	10724	<a href="#">3329aa</a>	Protein coding	<a href="#">CCDS39411</a>	<a href="#">P97929</a>	TSL:5 GENCODE basic APPRIS P1
Brca2-210	<a href="#">ENSMUST00000202313.1</a>	10517	<a href="#">3329aa</a>	Protein coding	<a href="#">CCDS39411</a>	<a href="#">P97929</a>	TSL:1 GENCODE basic APPRIS P1
Brca2-208	<a href="#">ENSMUST00000202003.3</a>	3473	<a href="#">992aa</a>	Protein coding	-	<a href="#">A0A0J9YVI7</a>	CDS 3' incomplete TSL:1
Brca2-206	<a href="#">ENSMUST00000201309.3</a>	1340	No protein	Processed transcript	-	-	TSL:1
Brca2-203	<a href="#">ENSMUST00000201149.1</a>	634	No protein	Processed transcript	-	-	TSL:5
Brca2-209	<a href="#">ENSMUST00000202192.1</a>	588	No protein	Processed transcript	-	-	TSL:2
Brca2-214	<a href="#">ENSMUST00000202975.3</a>	2534	No protein	Retained intron	-	-	TSL:2
Brca2-204	<a href="#">ENSMUST00000201165.1</a>	1742	No protein	Retained intron	-	-	TSL:NA
Brca2-202	<a href="#">ENSMUST00000200686.3</a>	937	No protein	Retained intron	-	-	TSL:2
Brca2-205	<a href="#">ENSMUST00000201226.1</a>	864	No protein	Retained intron	-	-	TSL:2
Brca2-211	<a href="#">ENSMUST00000202693.1</a>	688	No protein	Retained intron	-	-	TSL:3
Brca2-213	<a href="#">ENSMUST00000202837.1</a>	669	No protein	Retained intron	-	-	TSL:3
Brca2-207	<a href="#">ENSMUST00000201678.1</a>	646	No protein	Retained intron	-	-	TSL:3
Brca2-212	<a href="#">ENSMUST00000202727.1</a>	479	No protein	Retained intron	-	-	TSL:2

The strategy is based on the design of *Brca2-201* transcript,The transcription is shown below



# Genomic location distribution





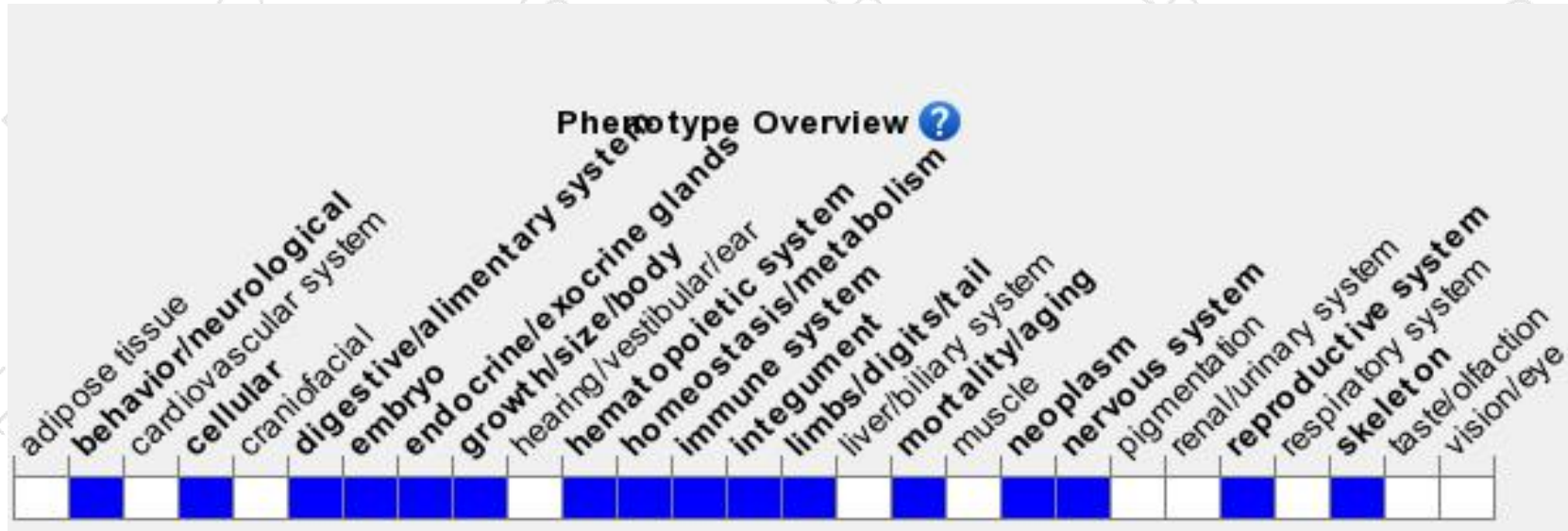
# Protein domain



集萃药康  
GemPharmatech



# 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 null mutants are embryonic lethal with abnormalities including growth retardation, neural tube defects, and mesoderm abnormalities; conditional mutations cause genetic instability and enhanced tumor formation; mutants with truncated BRCA2 protein survive, are small, infertile, show improper tissue differentiation and develop lymphomas and carcinomas.

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

Tel: 400-9660890

