

# *Becn1* Cas9-KO Strategy

**Designer:**

**Huan Wang**

**Design Date:**

**2019-7-22**

# Project Overview



**Project Name**

***Becn1***

**Project type**

**Cas9-KO**

**Strain background**

**C57BL/6JGpt**

# Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Becn1* gene. The schematic diagram is as follows:



- The *Becn1* gene has 17 transcripts. According to the structure of *Becn1* gene, exon3 of *Becn1-205* (ENSMUST00000130916.7) transcript is recommended as the knockout region. The region contains 68bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Becn1* gene. The brief process is as follows: CRISPR/Cas9 system

- According to the existing MGI data, Mice homozygous for a knock-out allele exhibit prenatal lethality. Mice heterozygous for this allele exhibit premature death, increased tumor incidence and reduced autophagy.
- The *Becn1* gene is located on the Chr11. 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)

## Becn1 beclin 1, autophagy related [Mus musculus (house mouse)]

Gene ID: 56208, updated on 2-Apr-2019

### Summary



<b>Official Symbol</b>	Becn1 provided by <a href="#">MGI</a>
<b>Official Full Name</b>	beclin 1, autophagy related provided by <a href="#">MGI</a>
<b>Primary source</b>	<a href="#">MGI:MGI:1891828</a>
<b>See related</b>	<a href="#">Ensembl:ENSMUSG00000035086</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>	Atg6
<b>Expression</b>	Ubiquitous expression in CNS E11.5 (RPKM 39.6), bladder adult (RPKM 35.6) and 28 other tissues <a href="#">See more</a>
<b>Orthologs</b>	<a href="#">human</a> <a href="#">all</a>

# Transcript information (Ensembl)

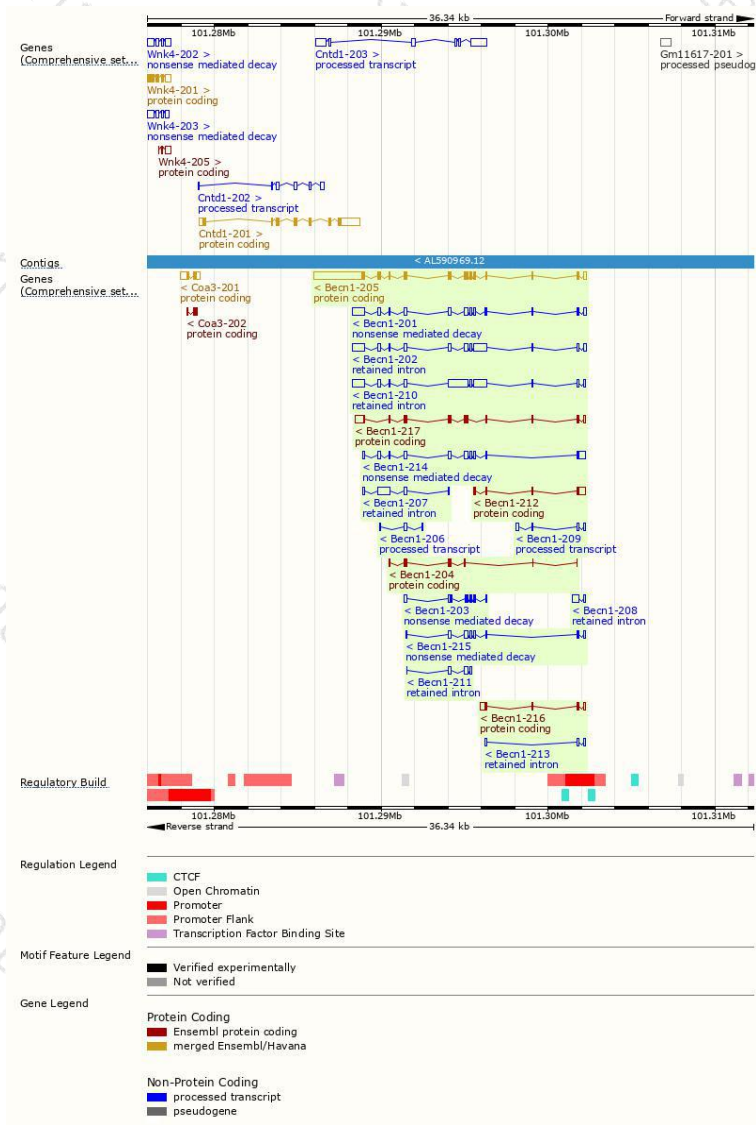
The gene has 17 transcripts, all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Becn1-217	<a href="#">ENSMUST00000172233.7</a>	1493	<a href="#">277aa</a>	Protein coding	-	<a href="#">E9PYD6</a>	TSL:5 GENCODE basic
Becn1-216	<a href="#">ENSMUST00000170502.1</a>	725	<a href="#">105aa</a>	Protein coding	-	<a href="#">E9QAM0</a>	TSL:1 GENCODE basic
Becn1-215	<a href="#">ENSMUST00000167818.7</a>	899	<a href="#">46aa</a>	Nonsense mediated decay	-	<a href="#">E9PX06</a>	TSL:5
Becn1-214	<a href="#">ENSMUST00000167667.7</a>	1599	<a href="#">46aa</a>	Nonsense mediated decay	-	<a href="#">E9PX06</a>	TSL:5
Becn1-213	<a href="#">ENSMUST00000164036.7</a>	329	No protein	Retained intron	-	-	TSL:3
Becn1-212	<a href="#">ENSMUST00000140706.7</a>	684	<a href="#">110aa</a>	Protein coding	-	<a href="#">F7DB15</a>	CDS 3' incomplete TSL:2
Becn1-211	<a href="#">ENSMUST00000140286.1</a>	487	No protein	Retained intron	-	-	TSL:5
Becn1-210	<a href="#">ENSMUST00000139997.8</a>	3476	No protein	Retained intron	-	-	TSL:1
Becn1-209	<a href="#">ENSMUST00000139669.1</a>	463	No protein	lncRNA	-	-	TSL:3
Becn1-208	<a href="#">ENSMUST00000137614.1</a>	506	No protein	Retained intron	-	-	TSL:1
Becn1-207	<a href="#">ENSMUST00000136535.7</a>	1002	No protein	Retained intron	-	-	TSL:5
Becn1-206	<a href="#">ENSMUST00000135805.7</a>	239	No protein	lncRNA	-	-	TSL:5
Becn1-205	<a href="#">ENSMUST00000130916.7</a>	4365	<a href="#">448aa</a>	Protein coding	<a href="#">CCDS25462</a>	<a href="#">O88597</a>	TSL:1 GENCODE basic APPRIS P1
Becn1-204	<a href="#">ENSMUST00000129863.1</a>	375	<a href="#">125aa</a>	Protein coding	-	<a href="#">F7CVL9</a>	CDS 5' and 3' incomplete TSL:5
Becn1-203	<a href="#">ENSMUST00000126195.1</a>	786	<a href="#">168aa</a>	Nonsense mediated decay	-	<a href="#">F7C090</a>	CDS 5' incomplete TSL:3
Becn1-202	<a href="#">ENSMUST00000122817.7</a>	2662	No protein	Retained intron	-	-	TSL:1
Becn1-201	<a href="#">ENSMUST00000041403.11</a>	2123	<a href="#">105aa</a>	Nonsense mediated decay	-	<a href="#">E9QAM0</a>	TSL:1

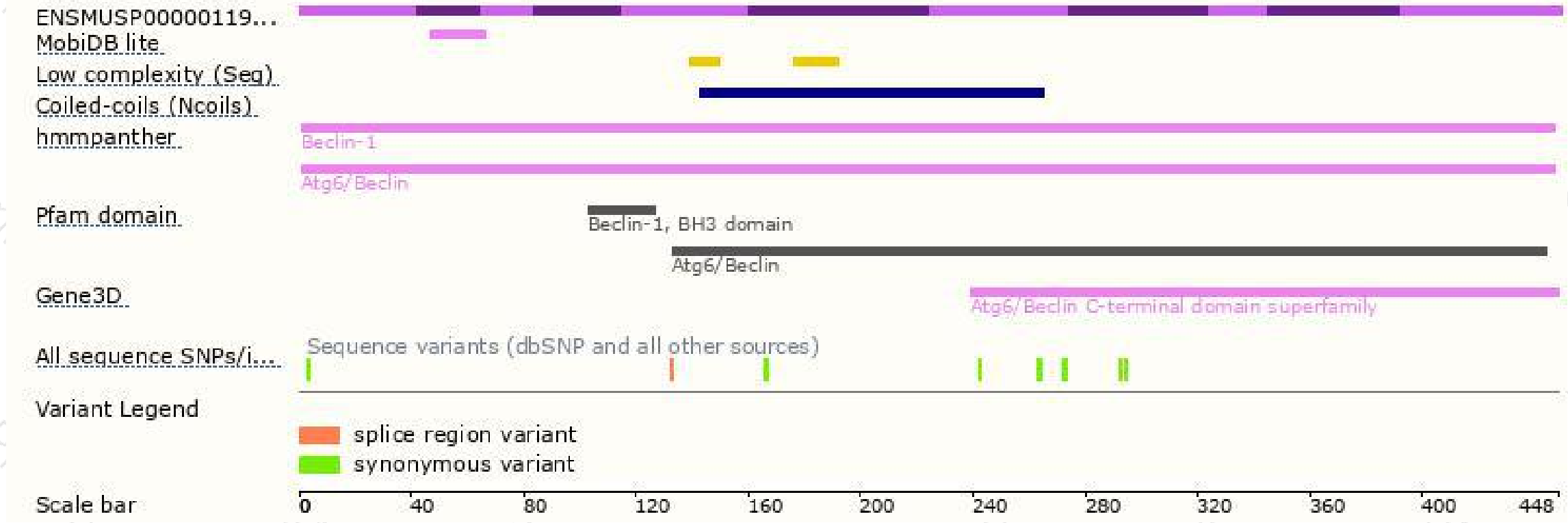
The strategy is based on the design of *Becn1-205* transcript, The transcription is shown below



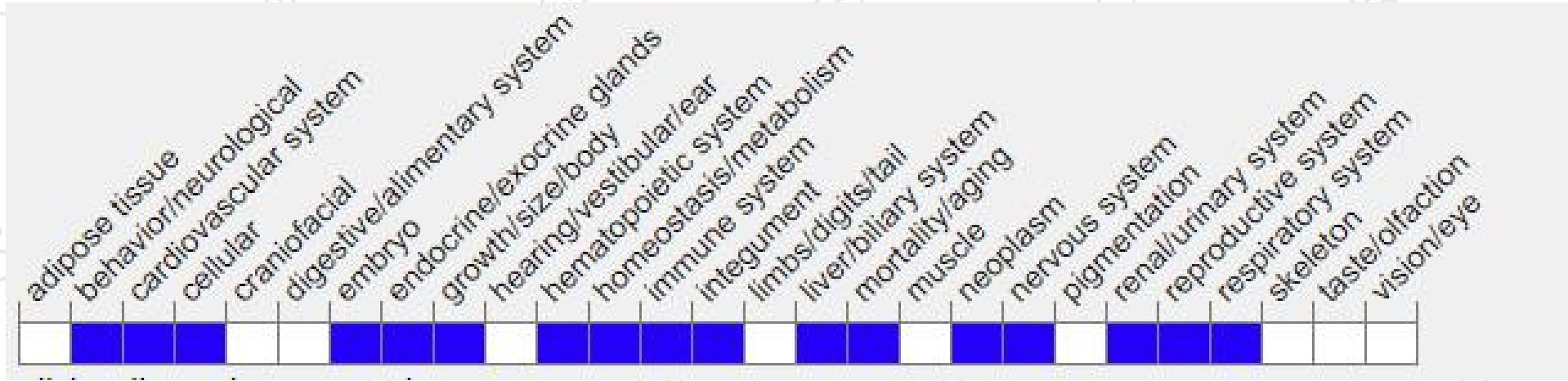
# Genomic location distribution



# 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 prenatal lethality. Mice heterozygous for this allele exhibit premature death, increased tumor incidence and reduced autophagy.

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

Tel: 400-9660890

