

# *Ube3a* Cas9-KO Strategy

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# Project Overview

**Project Name**

***Ube3a***

**Project type**

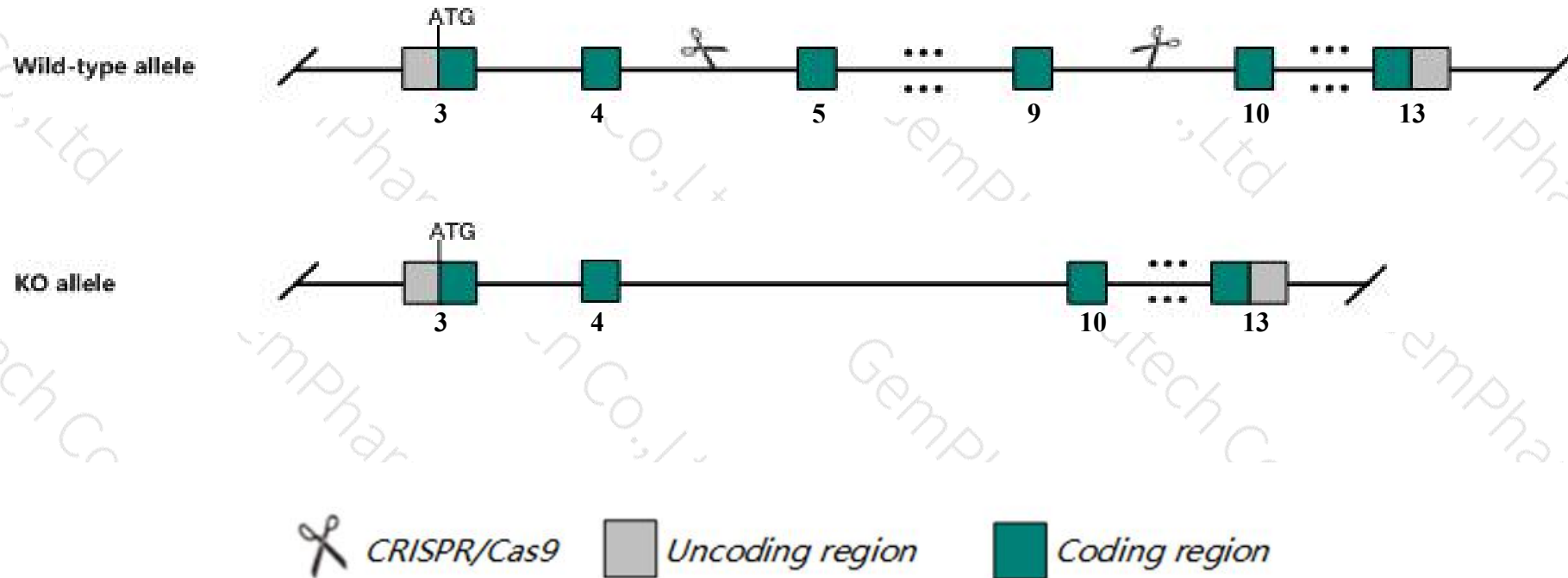
**Cas9-KO**

**Strain background**

**C57BL/6JGpt**

# Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Ube3a* gene. The schematic diagram is as follows:



- The *Ube3a* gene has 18 transcripts. According to the structure of *Ube3a* gene, exon5-exon9 of *Ube3a-203* (ENSMUST00000200758.3) transcript is recommended as the knockout region. The region contains 2053bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Ube3a* gene. The brief process is as follows: CRISPR/Cas9 system

- According to the existing MGI data, Mice with maternally inherited targeted null mutations exhibit reduced brain weight, impaired motor function, inducible seizures, learning deficits, abnormal hippocampal electroencephalographic recordings, and severely impaired long-term potentiation.
- The *Ube3a* gene is located on the Chr7. 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)

## Ube3a ubiquitin protein ligase E3A [Mus musculus (house mouse)]

Gene ID: 22215, updated on 9-Apr-2019

### Summary



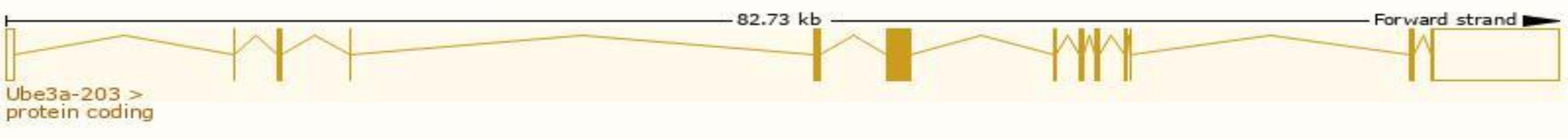
<b>Official Symbol</b>	Ube3a provided by <a href="#">MGI</a>
<b>Official Full Name</b>	ubiquitin protein ligase E3A provided by <a href="#">MGI</a>
<b>Primary source</b>	<a href="#">MGI:MGI:105098</a>
<b>See related</b>	<a href="#">Ensembl:ENSMUSG000000025326</a>
<b>Gene type</b>	protein coding
<b>RefSeq 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>	4732496B02, 5830462N02Rik, A130086L21Rik, Hpve6a
<b>Expression</b>	Ubiquitous expression in adrenal adult (RPKM 21.0), ovary adult (RPKM 10.5) and 28 other tissues <a href="#">See more</a>
<b>Orthologs</b>	<a href="#">human</a> <a href="#">all</a>

# Transcript information (Ensembl)

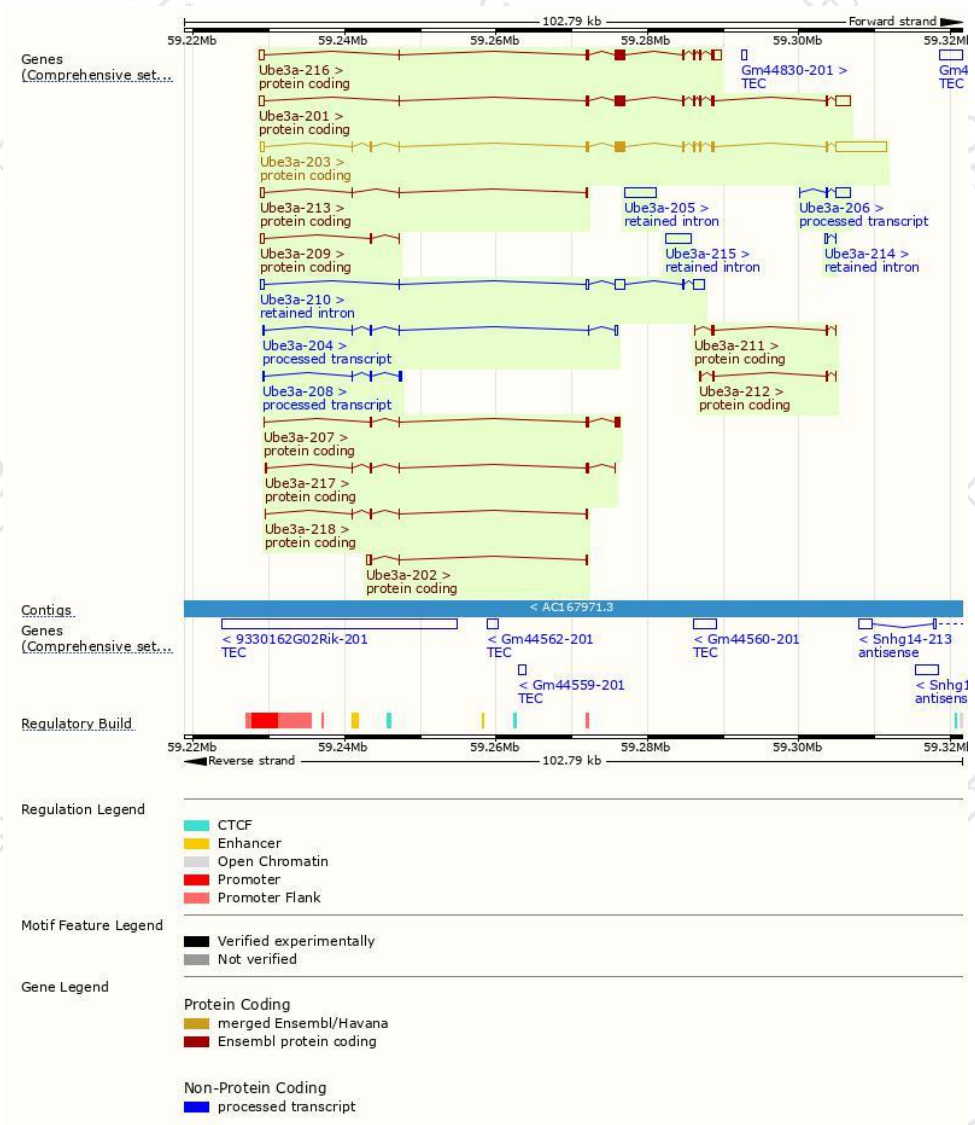
The gene has 18 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Ube3a-203	<a href="#">ENSMUST00000200758.3</a>	9856	<a href="#">870aa</a>	Protein coding	<a href="#">CCDS39973</a>	<a href="#">O08759</a>	TSL:1 GENCODE basic APPRIS P3
Ube3a-201	<a href="#">ENSMUST00000107537.4</a>	4911	<a href="#">849aa</a>	Protein coding	<a href="#">CCDS80733</a>	<a href="#">O08759</a>	TSL:1 GENCODE basic APPRIS ALT2
Ube3a-216	<a href="#">ENSMUST00000202945.3</a>	3889	<a href="#">762aa</a>	Protein coding	-	<a href="#">O08759</a>	TSL:1 GENCODE basic
Ube3a-207	<a href="#">ENSMUST00000201409.3</a>	1119	<a href="#">313aa</a>	Protein coding	-	<a href="#">A0A0J9YUK0</a>	CDS 3' incomplete TSL:3
Ube3a-217	<a href="#">ENSMUST00000207686.1</a>	797	<a href="#">126aa</a>	Protein coding	-	<a href="#">A0A140LHS2</a>	CDS 3' incomplete TSL:5
Ube3a-213	<a href="#">ENSMUST00000202440.3</a>	729	<a href="#">49aa</a>	Protein coding	-	<a href="#">A0A0J9YTX6</a>	CDS 3' incomplete TSL:5
Ube3a-202	<a href="#">ENSMUST00000200709.1</a>	664	<a href="#">40aa</a>	Protein coding	-	<a href="#">A0A0J9YUF2</a>	CDS 3' incomplete TSL:3
Ube3a-209	<a href="#">ENSMUST00000201794.3</a>	616	<a href="#">15aa</a>	Protein coding	-	<a href="#">A0A0J9YV26</a>	CDS 3' incomplete TSL:3
Ube3a-211	<a href="#">ENSMUST00000202247.3</a>	579	<a href="#">192aa</a>	Protein coding	-	<a href="#">A0A0J9YUY4</a>	CDS 5' incomplete TSL:3
Ube3a-212	<a href="#">ENSMUST00000202288.1</a>	442	<a href="#">143aa</a>	Protein coding	-	<a href="#">A0A0J9YVG1</a>	CDS 5' incomplete TSL:5
Ube3a-218	<a href="#">ENSMUST00000208313.1</a>	441	<a href="#">78aa</a>	Protein coding	-	<a href="#">A0A140LI50</a>	CDS 3' incomplete TSL:5
Ube3a-205	<a href="#">ENSMUST00000200949.1</a>	4254	No protein	Retained intron	-	-	TSL:NA
Ube3a-210	<a href="#">ENSMUST00000202207.3</a>	3586	No protein	Retained intron	-	-	TSL:1
Ube3a-215	<a href="#">ENSMUST00000202776.1</a>	3348	No protein	Retained intron	-	-	TSL:NA
Ube3a-214	<a href="#">ENSMUST00000202685.1</a>	436	No protein	Retained intron	-	-	TSL:2
Ube3a-206	<a href="#">ENSMUST00000201162.1</a>	2129	No protein	lncRNA	-	-	TSL:1
Ube3a-204	<a href="#">ENSMUST00000200781.3</a>	742	No protein	lncRNA	-	-	TSL:5
Ube3a-208	<a href="#">ENSMUST00000201480.1</a>	549	No protein	lncRNA	-	-	TSL:5

The strategy is based on the design of *Ube3a-203* transcript,The transcription is shown below



# Genomic location distribution

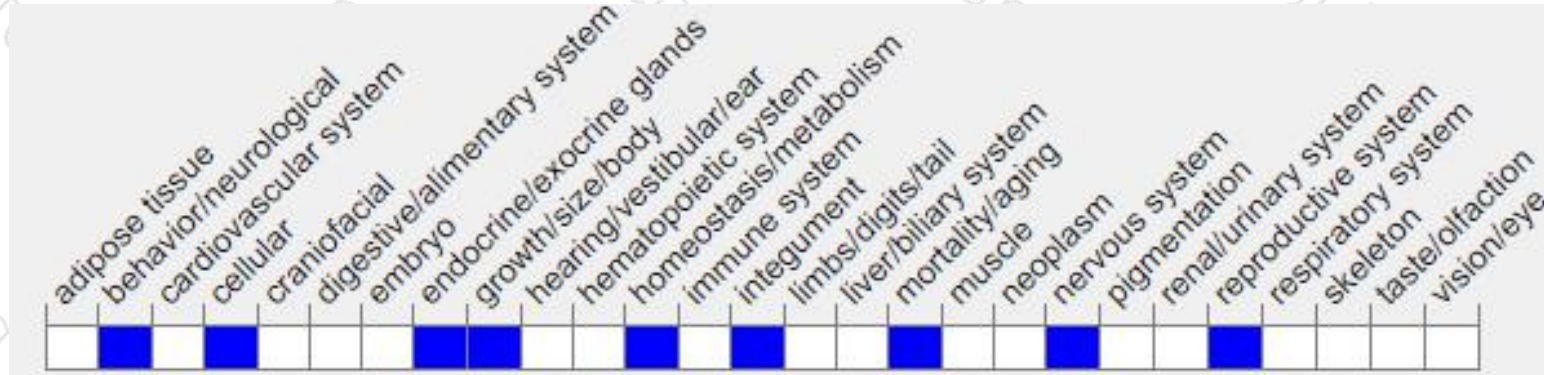




# Protein domain



# 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 with maternally inherited targeted null mutations exhibit reduced brain weight, impaired motor function, inducible seizures, learning deficits, abnormal hippocampal electroencephalographic recordings, and severely impaired long-term potentiation.

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

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