

# ***Herc2 Cas9-CKO Strategy***

**Designer:**

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**Design Date:**

**2019-8-11**

# Project Overview

**Project Name**

***Herc2***

**Project type**

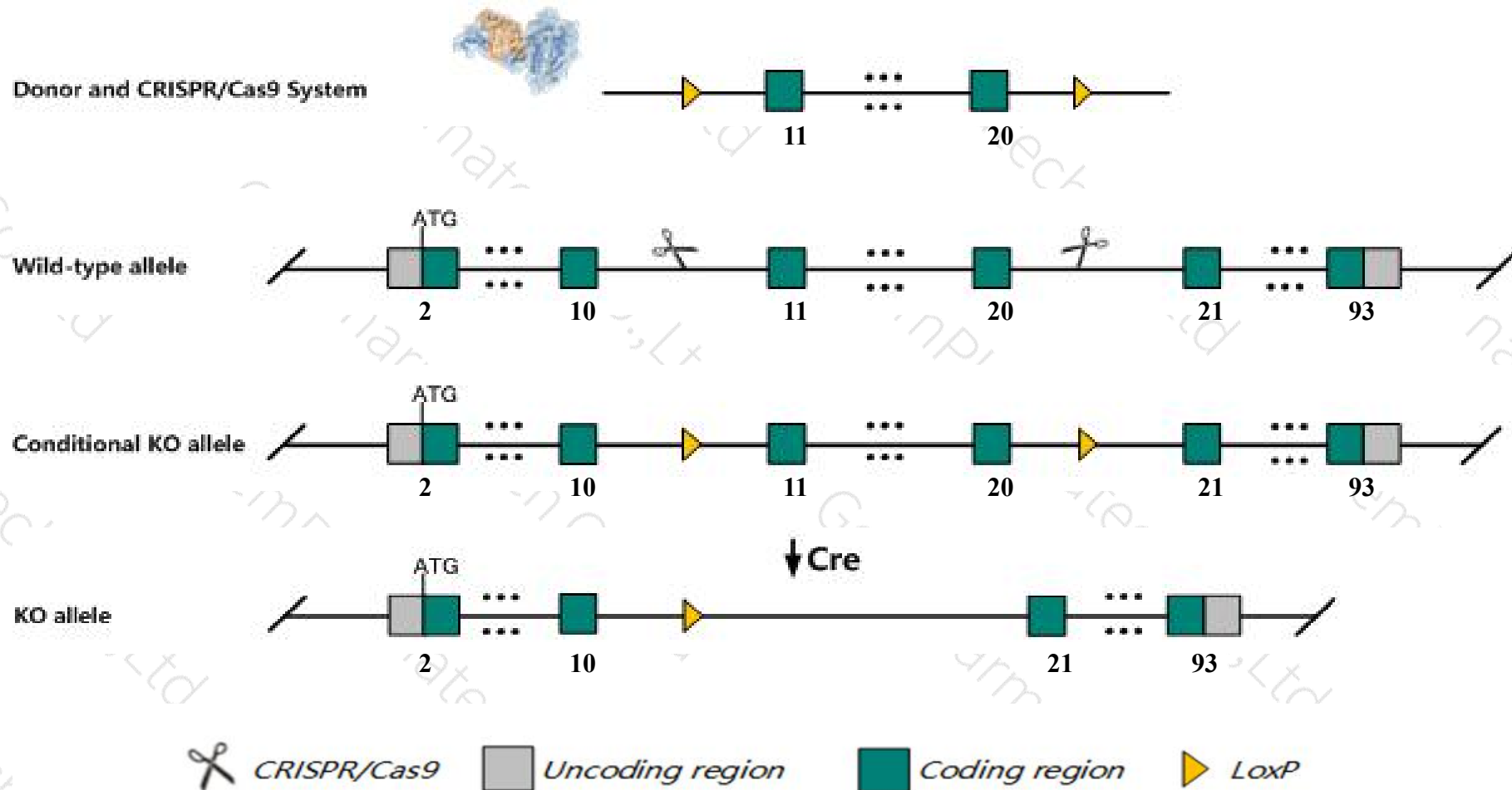
**Cas9-CKO**

**Strain background**

**C57BL/6JGpt**

# Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Herc2* gene. The schematic diagram is as follows:



- The *Herc2* gene has 8 transcripts. According to the structure of *Herc2* gene, exon11-exon20 of *Herc2-201* (ENSMUST00000076226.12) transcript is recommended as the knockout region. The region contains 1793bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Herc2* gene. The brief process is as follows: CRISPR/Cas9 system and Donor 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.
- The flox mice will be knocked out after mating with mice expressing Cre recombinase, resulting in the loss of function of the target gene in specific tissues and cell types.

- According to the existing MGI data, Homozygotes for null mutations exhibit runting, nervousness, and incoordination. Males are sterile with sperm abnormalities, while females show reduced fertility and impaired maternal ability. Also see alleles at the Oca2 (p) locus for deletions that encompass the Herc2 gene.
- Transcript *Herc2-204*, *Herc2-205* may not be affected.
- The *Herc2* 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at existing technological level.



# Gene information (NCBI)

**Herc2 HECT and RLD domain containing E3 ubiquitin protein ligase 2 [ *Mus musculus* (house mouse) ]**

Gene ID: 15204, updated on 10-Aug-2019

Summary

Official Symbol

Herc2 provided by MGI

Official Full Name

HECT and RLD domain containing E3 ubiquitin protein ligase 2 provided by MGI

Primary source

MGI:MGI:103234

See related

Ensembl:ENSMUSG00000030451

Gene type

protein coding

RefSeq status

VALIDATED

Organism

*Mus musculus*

Lineage

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

Also known as

rjs; jdf2; D15F32S1h; mKIAA0393; D7H15F32S1; D7H15F37S1

Expression

Ubiquitous expression in CNS E18 (RPKM 12.1), cortex adult (RPKM 11.4) and 28 other tissues [See more](#)

Orthologs

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

Genomic context

Location:

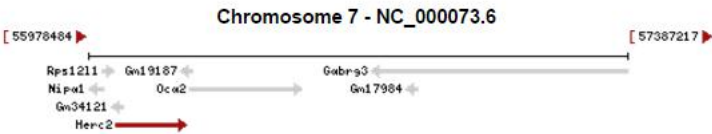
7 B5; 7 33.42 cM

Exon count:

94

[See Herc2 in Genome Data Viewer](#)

Annotation release	Status	Assembly	Chr	Location
<a href="#">106</a>	current	GRCm38.p4 ( <a href="#">GCF_000001635.24</a> )	7	NC_000073.6 (56050155..56231800)
Build 37.2	previous assembly	MGSCv37 ( <a href="#">GCF_000001635.18</a> )	7	NC_000073.5 (63305525..63487170)

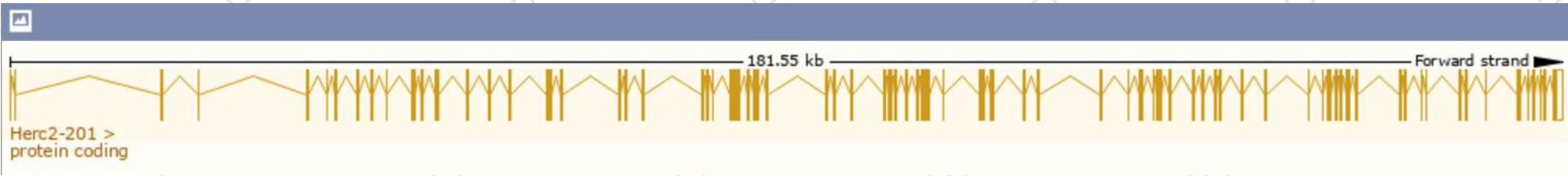


# Transcript information (Ensembl)

The gene has 8 transcripts,all transcripts are shown below:

Show/hide columns (1 hidden)							Filter	
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags	
Herc2-202	<a href="#">ENSMUST00000164095.2</a>	15261	<a href="#">4836aa</a>	Protein coding	<a href="#">CCDS21318</a>	<a href="#">Q4U2R1</a>	TSL:1	GENCODE basic APPRIS P2
Herc2-201	<a href="#">ENSMUST00000076226.12</a>	15250	<a href="#">4836aa</a>	Protein coding	<a href="#">CCDS21318</a>	<a href="#">Q4U2R1</a>	TSL:1	GENCODE basic APPRIS P2
Herc2-203	<a href="#">ENSMUST00000205303.1</a>	14403	<a href="#">4800aa</a>	Protein coding	-	<a href="#">Q4U2R1</a>	TSL:5	GENCODE basic APPRIS ALT2
Herc2-207	<a href="#">ENSMUST00000206537.1</a>	3009	<a href="#">965aa</a>	Protein coding	-	<a href="#">A0A0U1RPZ3</a>	CDS 3' incomplete	TSL:1
Herc2-205	<a href="#">ENSMUST00000205678.1</a>	501	<a href="#">167aa</a>	Protein coding	-	<a href="#">A0A0U1RNG9</a>	CDS 5' and 3' incomplete	TSL:1
Herc2-204	<a href="#">ENSMUST00000205653.1</a>	476	<a href="#">40aa</a>	Protein coding	-	<a href="#">A0A0U1RP01</a>	CDS 3' incomplete	TSL:3
Herc2-208	<a href="#">ENSMUST00000206990.2</a>	803	No protein	Retained intron	-	-	TSL:5	
Herc2-206	<a href="#">ENSMUST00000206101.1</a>	589	No protein	lncRNA	-	-	TSL:5	

The strategy is based on the design of *Herc2-201* transcript,The transcription is shown below

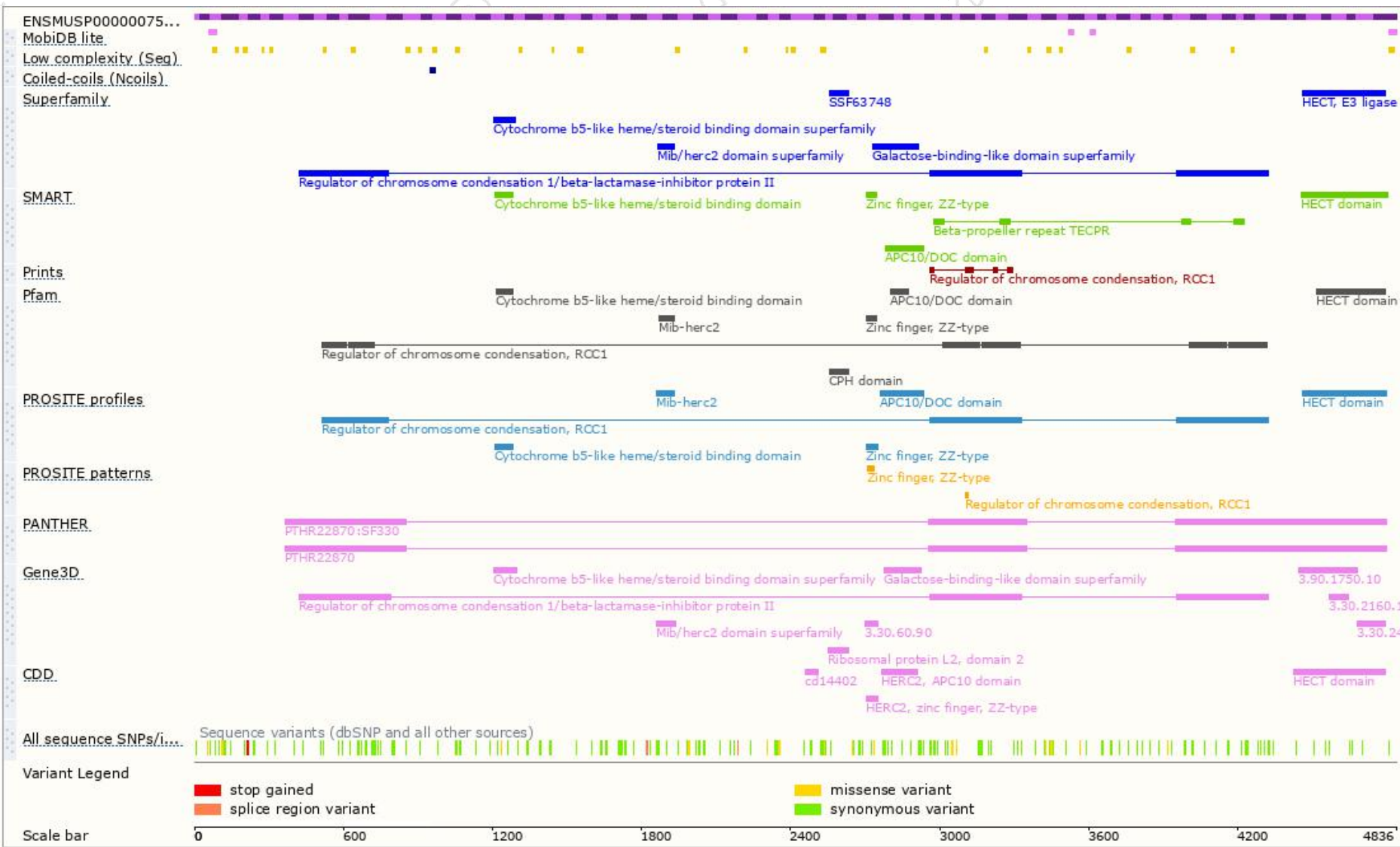


# Genomic location distribution

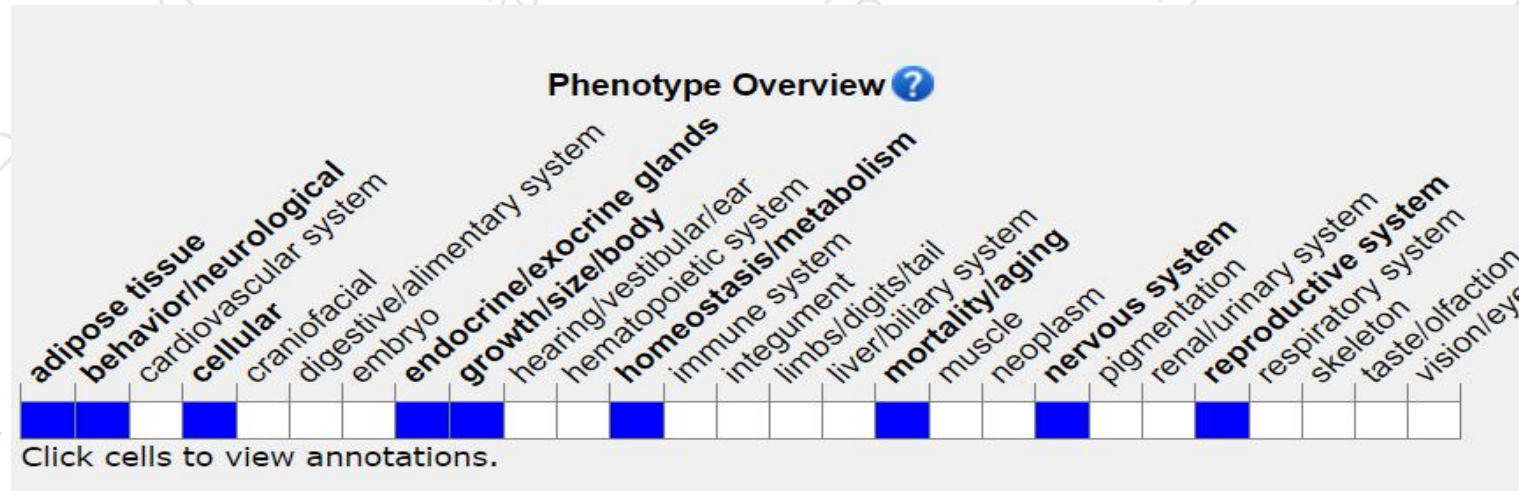




# Protein domain



# 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, Homozygotes for null mutations exhibit runting, nervousness, and incoordination.

Males are sterile with sperm abnormalities, while females show reduced fertility and impaired maternal ability. Also see alleles at the Oca2 (p) locus for deletions that encompass the Herc2 gene.

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

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