

Herc4 Cas9-CKO Strategy

Designer:

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Project Overview

Project Name

Herc4

Project type

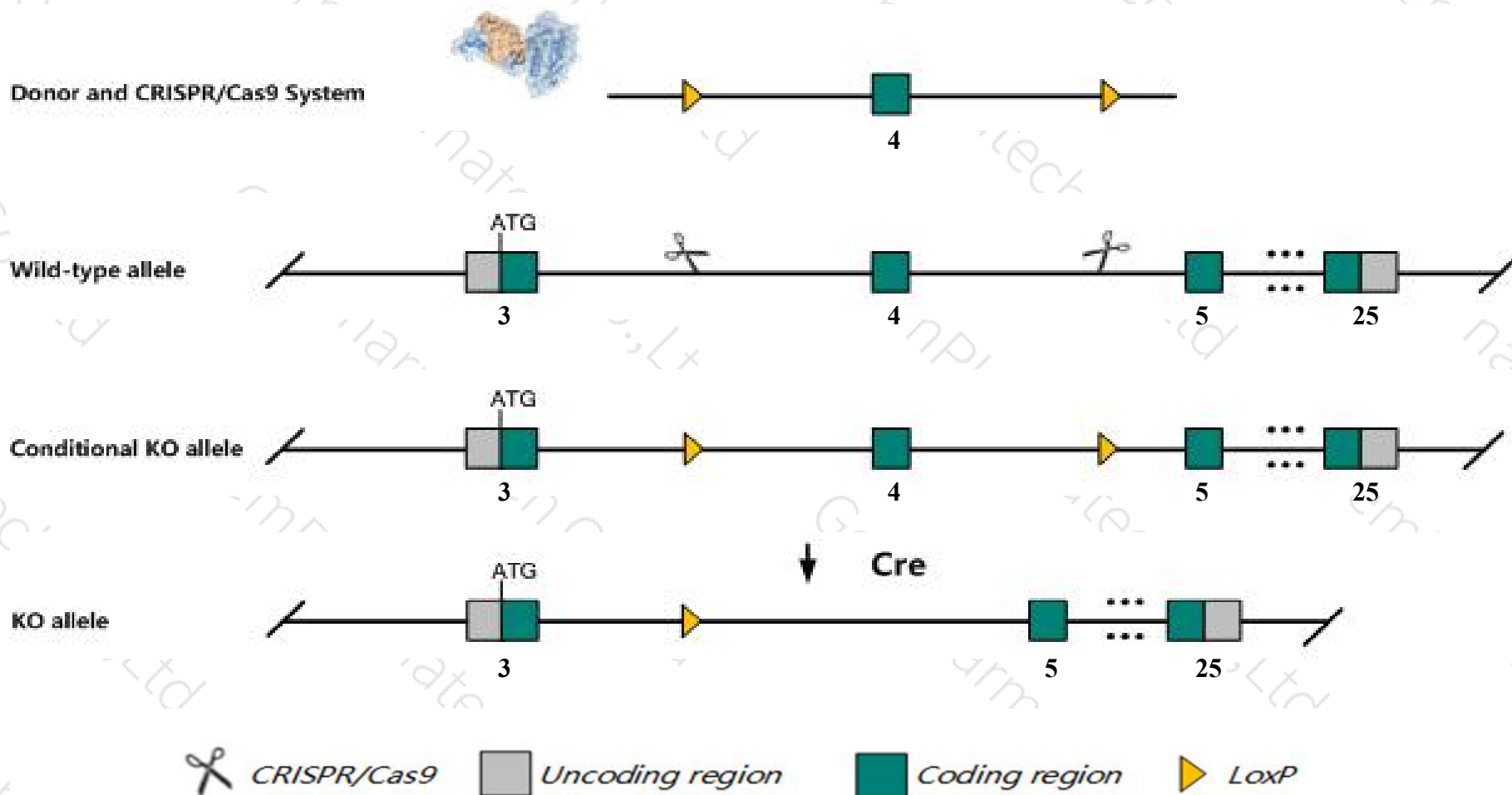
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Herc4* gene. The schematic diagram is as follows:



Technical routes

- The *Herc4* gene has 11 transcripts. According to the structure of *Herc4* gene, exon4 of *Herc4-201* (ENSMUST00000020258.9) transcript is recommended as the knockout region. The region contains 160bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Herc4* 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, Mice homozygous for a gene-trapped allele display reduced male fertility associated with a high percentage of angulated sperm tails and impaired sperm motility.
- The *Herc4* gene is located on the Chr10. 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)

Herc4 hect domain and RLD 4 [Mus musculus (house mouse)]

Gene ID: 67345, updated on 31-Jan-2019

Summary



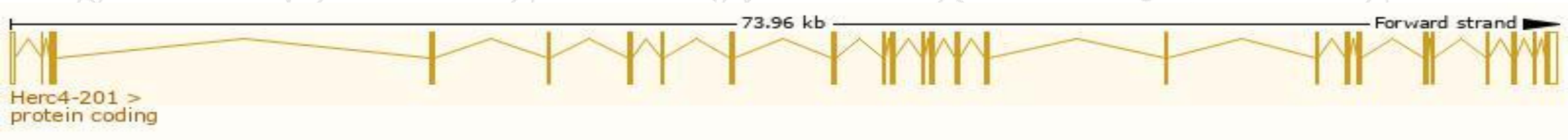
Official Symbol	Herc4 provided by MGI
Official Full Name	hect domain and RLD 4 provided by MGI
Primary source	MGI:MGI:1914595
See related	Ensembl:ENSMUSG00000020064
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	1700056O17Rik, 4921531D01Rik, 9530080M15Rik, mKIAA1593
Expression	Ubiquitous expression in testis adult (RPKM 13.5), bladder adult (RPKM 8.9) and 26 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

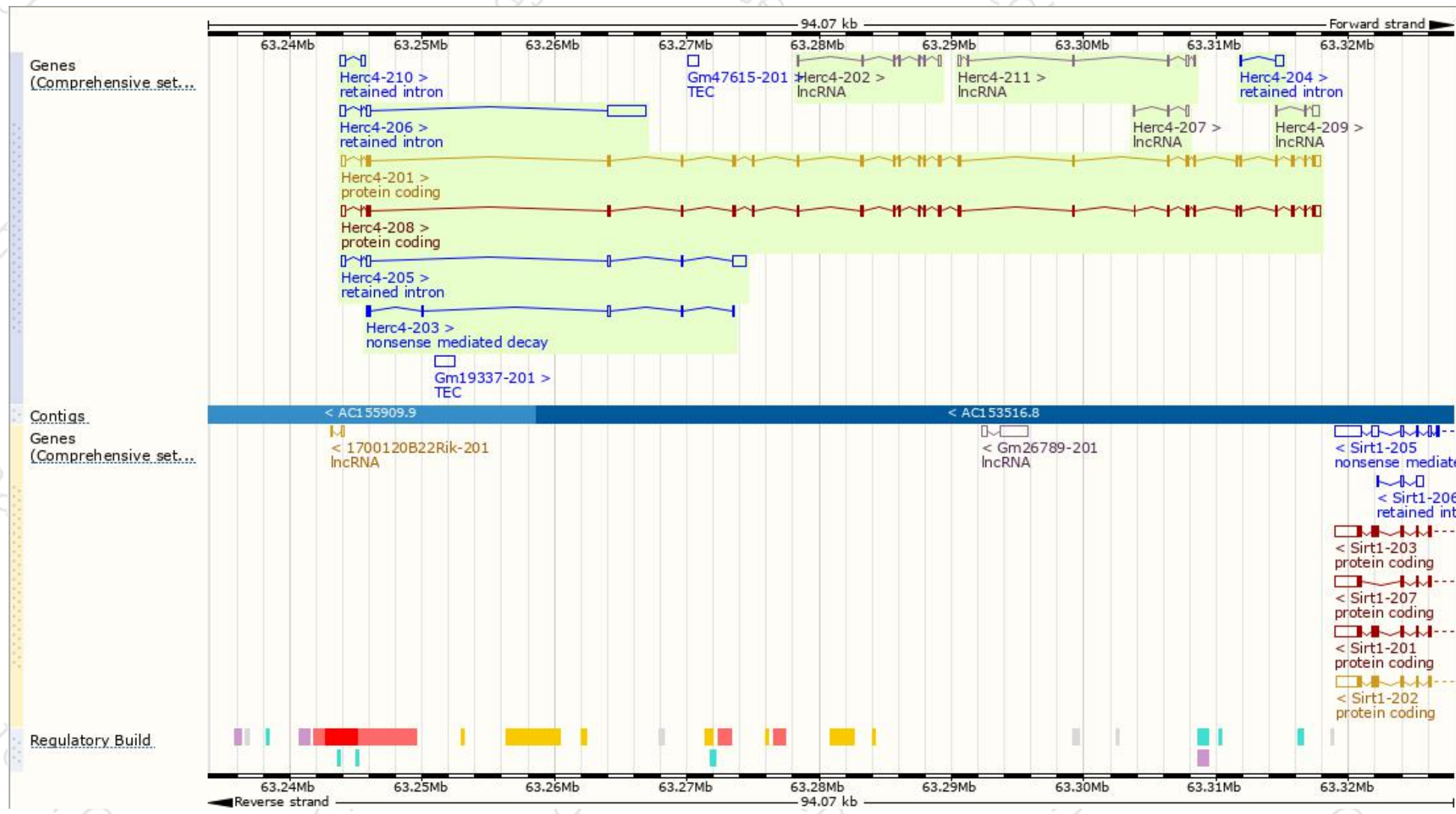
The gene has 11 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Herc4-201	ENSMUST00000020258.9	3898	1049aa	Protein coding	CCDS23897	Q6PAV2	TSL:1 GENCODE basic APPRIS P2
Herc4-208	ENSMUST000000219577.1	3914	1057aa	Protein coding	-	Q6PAV2	TSL:1 GENCODE basic APPRIS ALT1
Herc4-203	ENSMUST000000218533.1	791	79aa	Nonsense mediated decay	-	A0A1W2P735	TSL:3
Herc4-206	ENSMUST000000219230.1	3591	No protein	Retained intron	-	-	TSL:1
Herc4-205	ENSMUST000000219177.1	1775	No protein	Retained intron	-	-	TSL:1
Herc4-204	ENSMUST000000219002.1	687	No protein	Retained intron	-	-	TSL:3
Herc4-210	ENSMUST000000219856.1	653	No protein	Retained intron	-	-	TSL:3
Herc4-211	ENSMUST000000220097.1	808	No protein	lncRNA	-	-	TSL:5
Herc4-202	ENSMUST000000218073.1	732	No protein	lncRNA	-	-	TSL:3
Herc4-209	ENSMUST000000219789.1	713	No protein	lncRNA	-	-	TSL:3
Herc4-207	ENSMUST000000219279.1	429	No protein	lncRNA	-	-	TSL:5

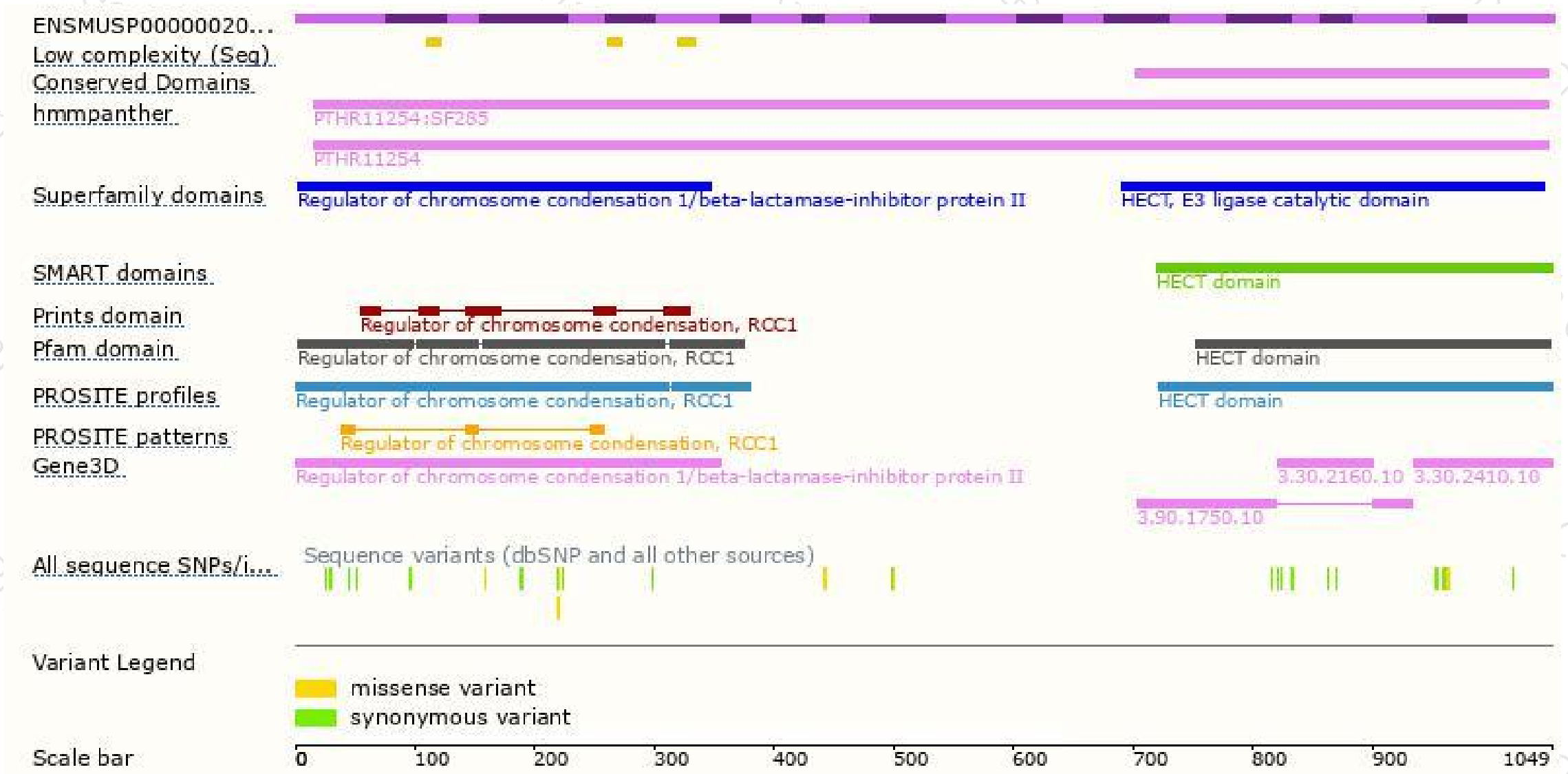
The strategy is based on the design of *Herc4-201* transcript,The transcription is shown below



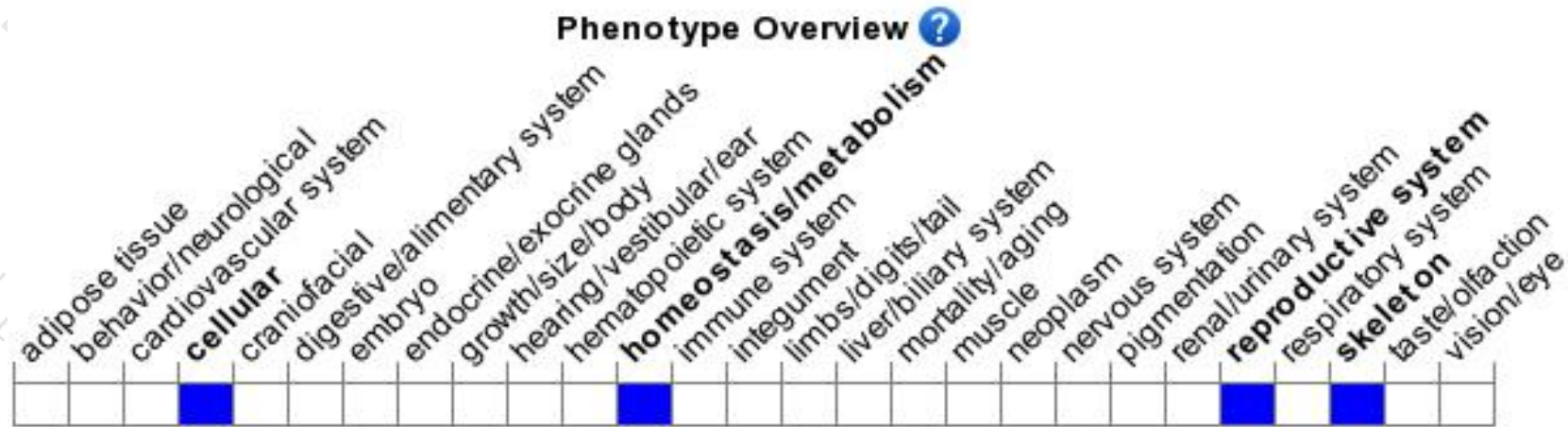
Genomic location distribution



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, Mice homozygous for a gene-trapped allele display reduced male fertility associated with a high percentage of angulated sperm tails and impaired sperm motility.

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

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