

Egr1 Cas9-CKO Strategy

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Reviewer :

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Project Overview

Project Name

Egr1

Project type

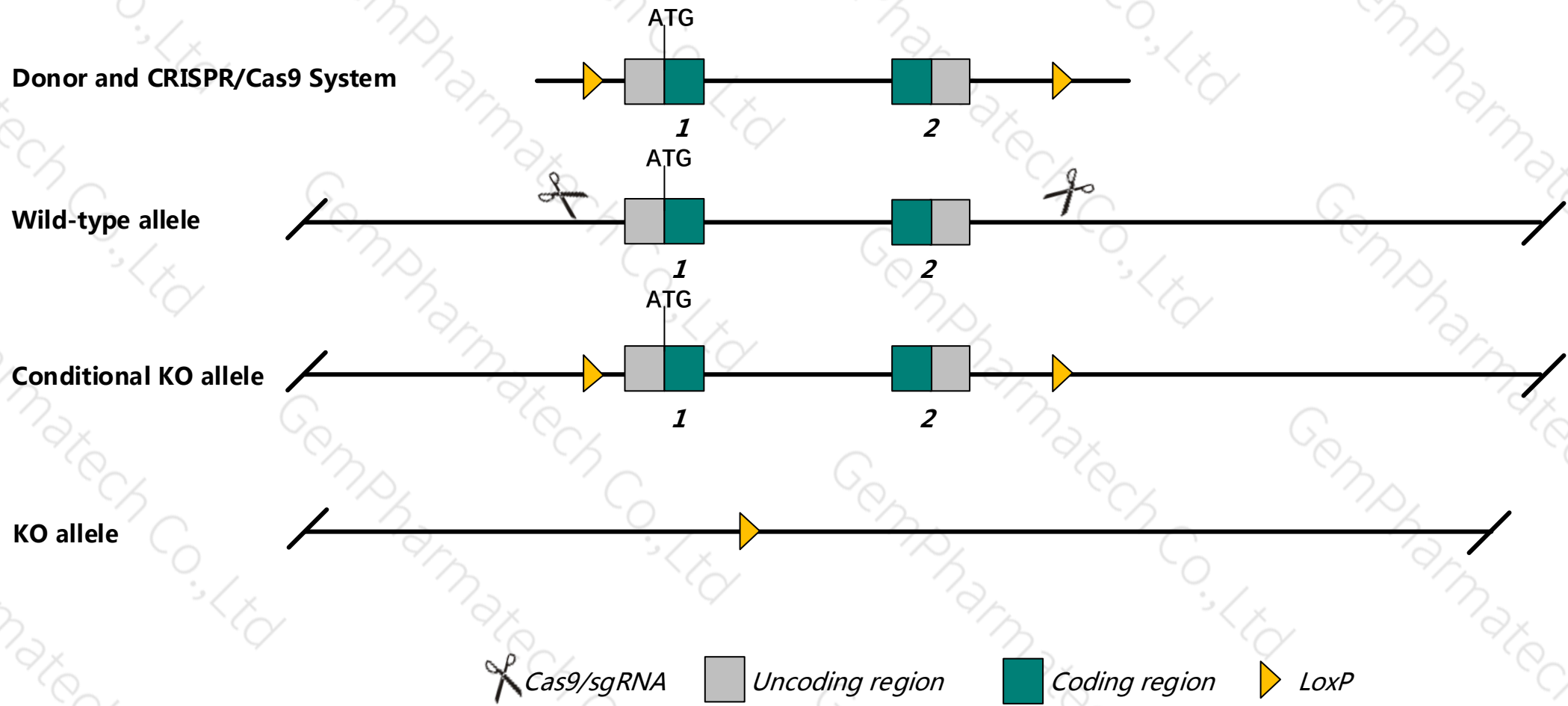
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Egr1* gene. The schematic diagram is as follows:



- The *Egr1* gene has 2 transcripts. According to the structure of *Egr1* gene, exon1-exon2 of *Egr1*-201 (ENSMUST00000064795.5) transcript is recommended as the knockout region. The region contains all of the coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Egr1* gene. The brief process is as follows: sgRNA was transcribed in vitro, donor vector was constructed. Cas9, sgRNA 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 was knocked out after mating with mice expressing Cre recombinase, resulting in the loss of function of the target gene in specific tissues or cell types.

- According to the existing MGI data , Homozygotes for targeted mutations are small and infertile due to pituitary defects. Mutants exhibit reductions in somatotropes and growth hormone content, and a lack of luteinizing hormone-beta expression. Ovaries lack luteinizing hormone receptors. Memory defects are also seen.
- The *Egr1* gene is located on the Chr18. 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

Gene information (NCBI)

Egr1 early growth response 1 [*Mus musculus* (house mouse)]

Gene ID: 13653, updated on 21-Oct-2019

Summary

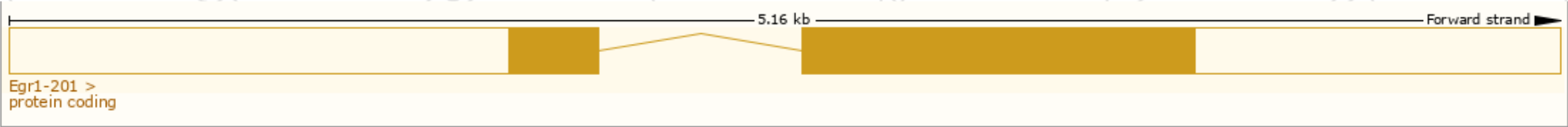
Official Symbol	Egr1 provided by MGI
Official Full Name	early growth response 1 provided by MGI
Primary source	MGI:MGI:95295
See related	Ensembl:ENSMUSG00000038418
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	egr; TIS8; Zenk; Egr-1; NGFIA; Zfp-6; ETR103; Krox-1; Krox24; NGF1-A; NGFI-A; Zif268; Krox-24; A530045N19Rik
Expression	Broad expression in thymus adult (RPKM 50.4), ovary adult (RPKM 42.9) and 21 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

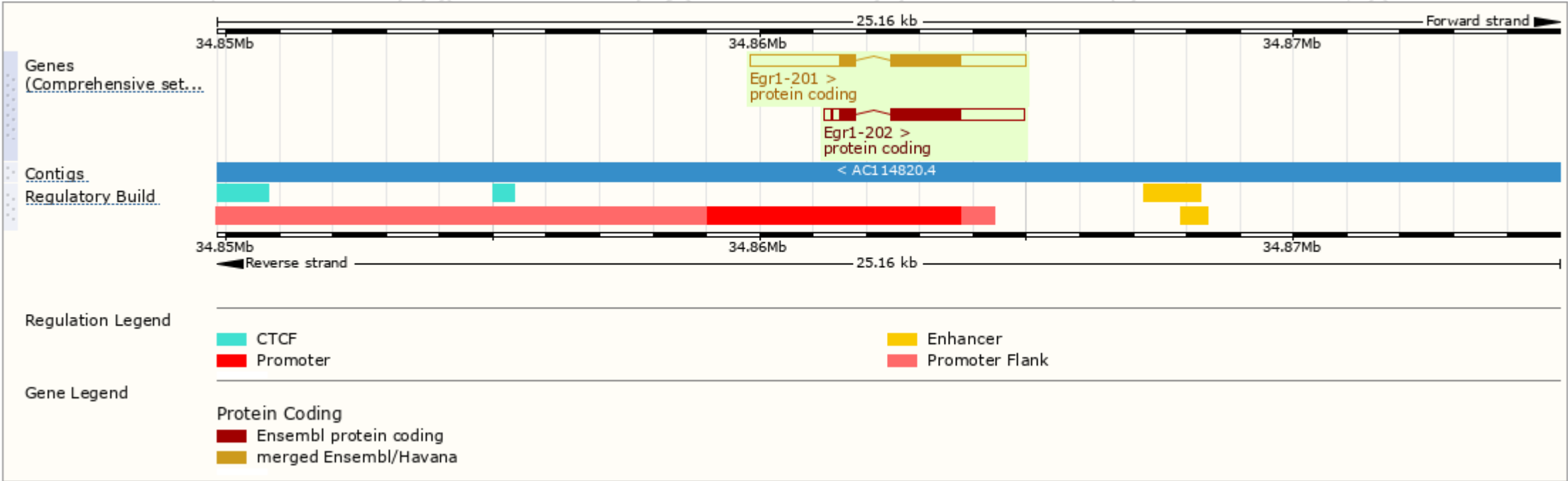
The gene has 2 transcripts, and all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Egr1-201	ENSMUST00000064795.5	4484	533aa	Protein coding	CCDS29136	P08046 Q544D6	TSL:1 GENCODE basic APPRIS P1
Egr1-202	ENSMUST00000165033.1	3036	533aa	Protein coding	CCDS29136	P08046 Q544D6	TSL:5 GENCODE basic APPRIS P1

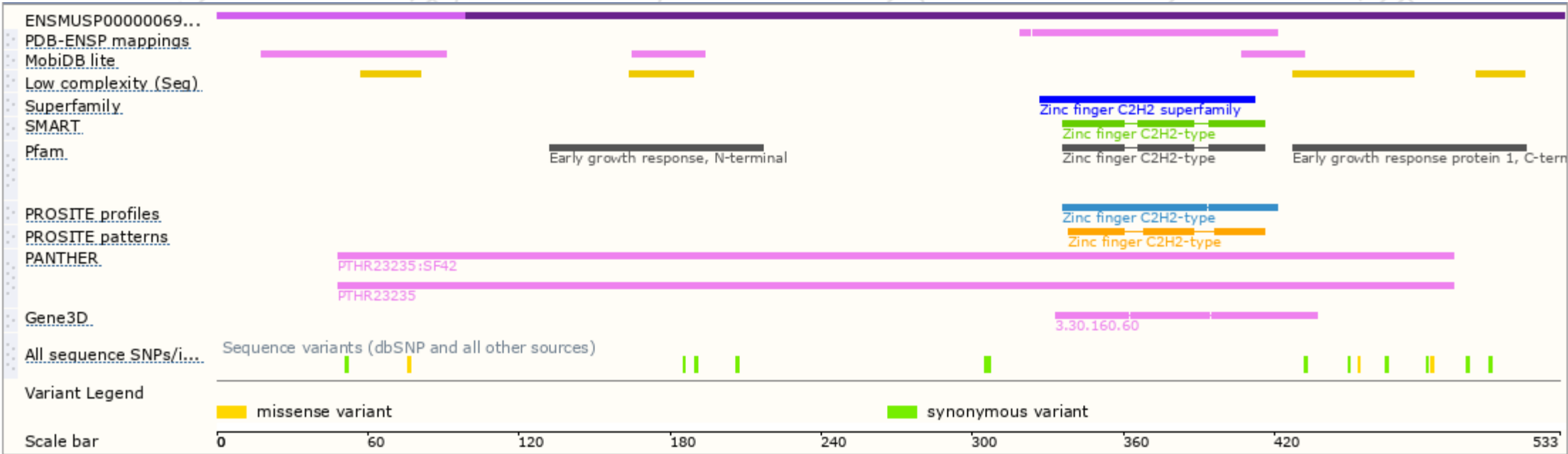
The strategy is based on the design of *Egr1*-201 transcript, The transcription is shown below



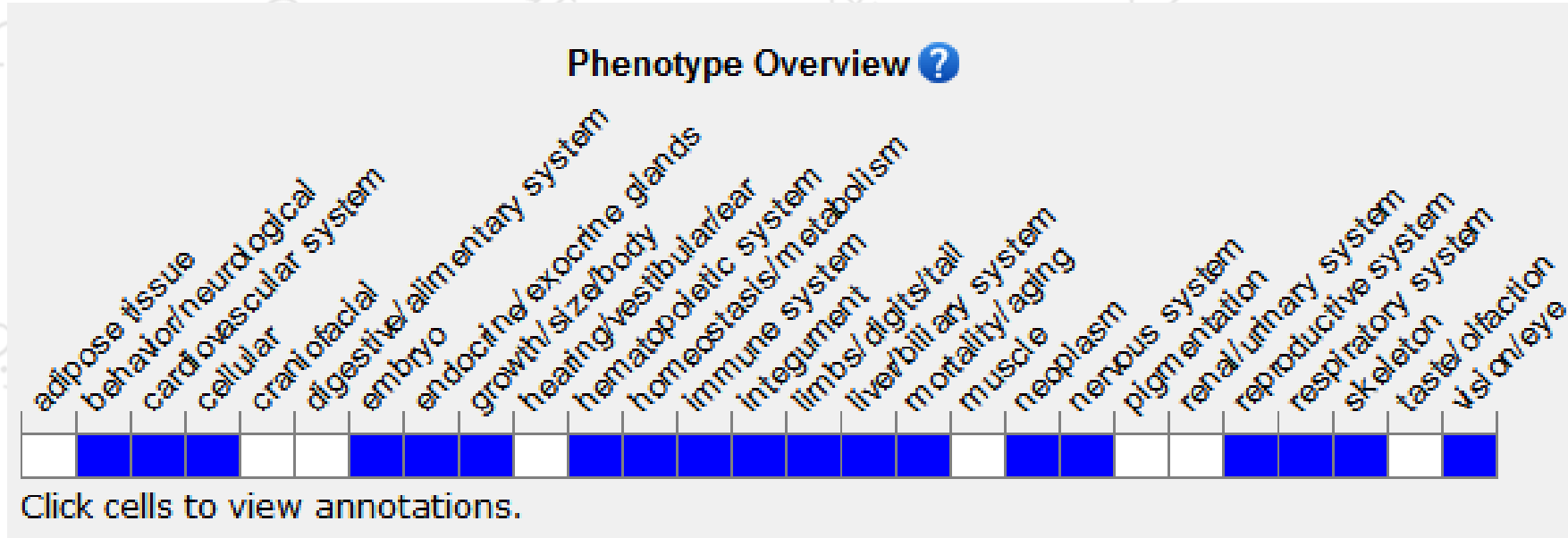
Genomic location distribution



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 targeted mutations are small and infertile due to pituitary defects. Mutants exhibit reductions in somatotropes and growth hormone content, and a lack of luteinizing hormone-beta expression. Ovaries lack luteinizing hormone receptors. Memory defects are also seen.

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