# *Egr1* Cas9-KO *Strategy*

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**Reviewer：** **Huimin Su**

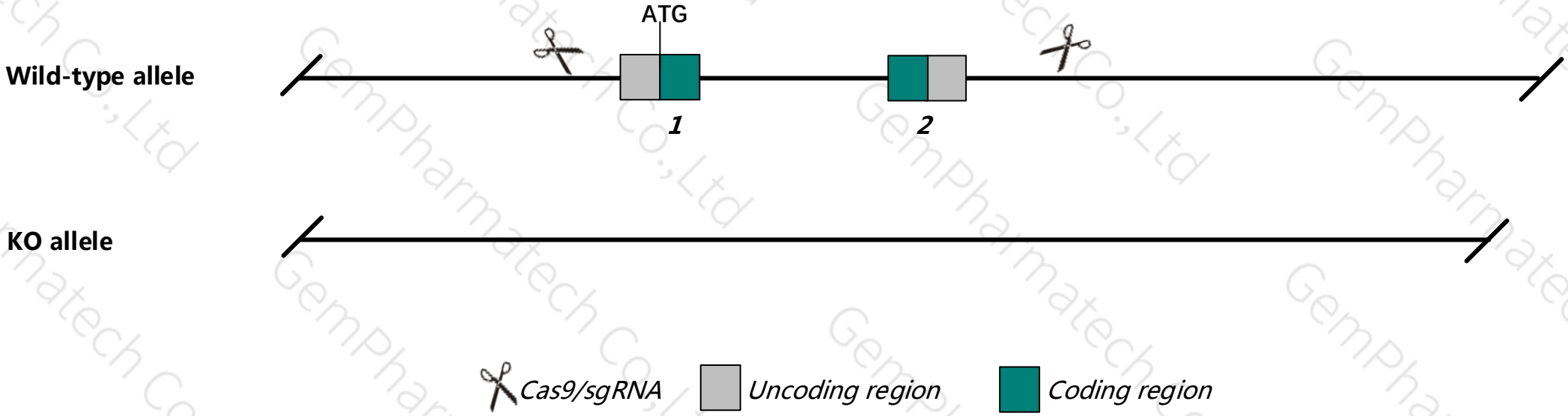
**Design Date:** **2019-10-23**

# Project Overview

| | |
|---|---|
| **Project Name** | ***Egr1*** |
| **Project type** | **Cas9-KO** |
| **Strain background** | **C57BL/6JGpt** |

# Knockout strategy

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



# Technical routes

- 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.Cas9, sgRNA 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.

# Notice

- 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 knockout on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

# Gene information （NCBI）

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

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

### Summary

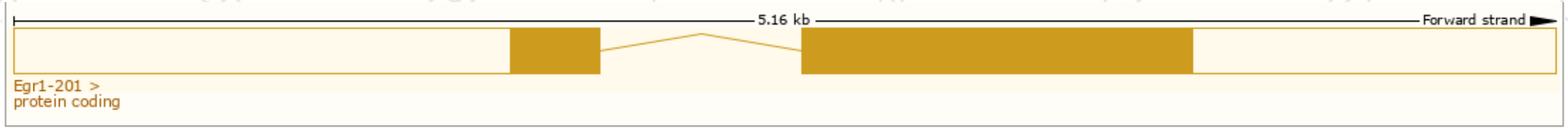
| | |
|---|---|
| **Official Symbol** | Egr1 provided by MGI |
| **Official Full Name** | early growth response 1 provided by MGI |
| **Primary source** | MGI:MGI:95295 |
| **See related** | Ensembl:ENSMUSG00000038418 |
| **Gene type** | protein coding |
| **RefSeq status** | VALIDATED |
| **Organism** | 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）

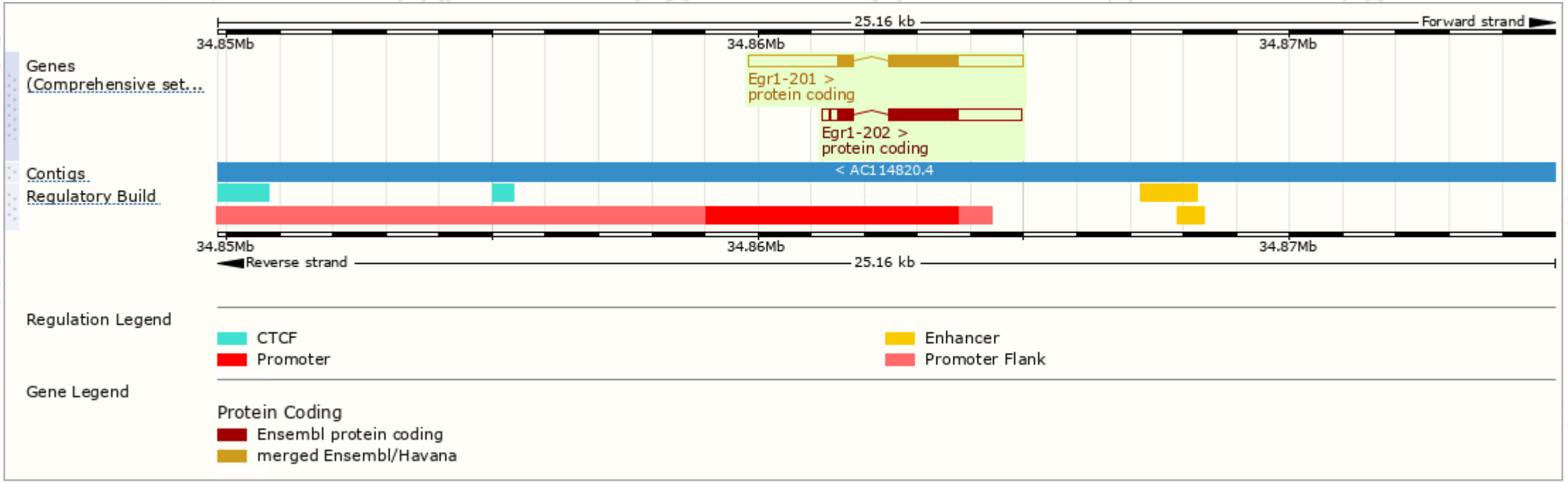
The gene has 2 transcripts, and all transcripts are shown below:

| 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 |

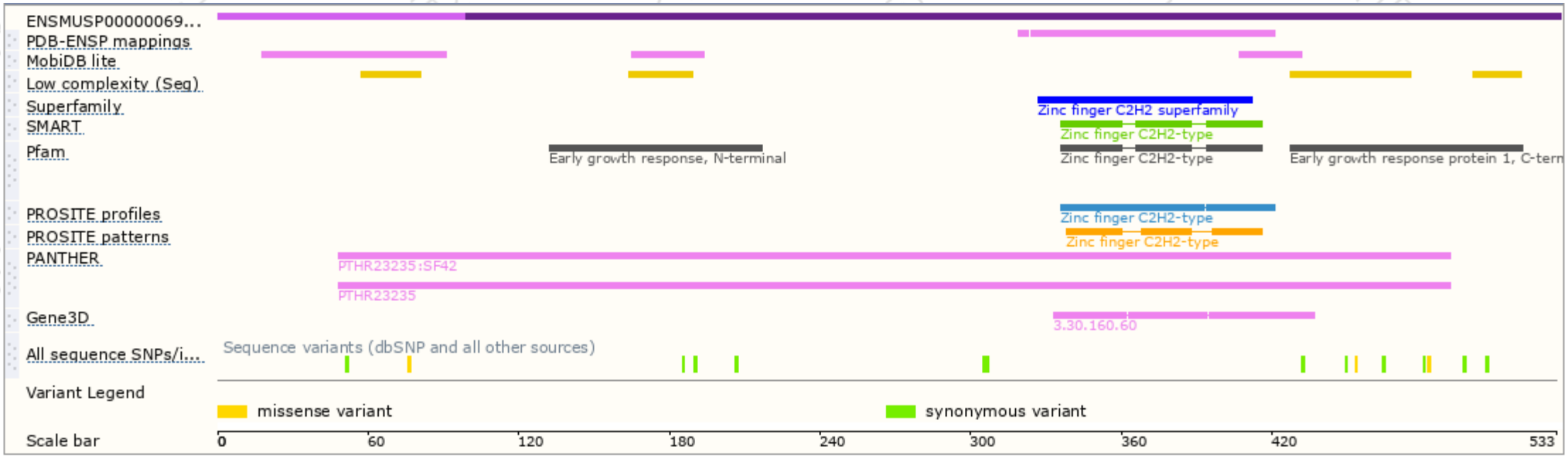
The strategy is based on the design of *Egr1*-201 transcript,The transcription is shown below



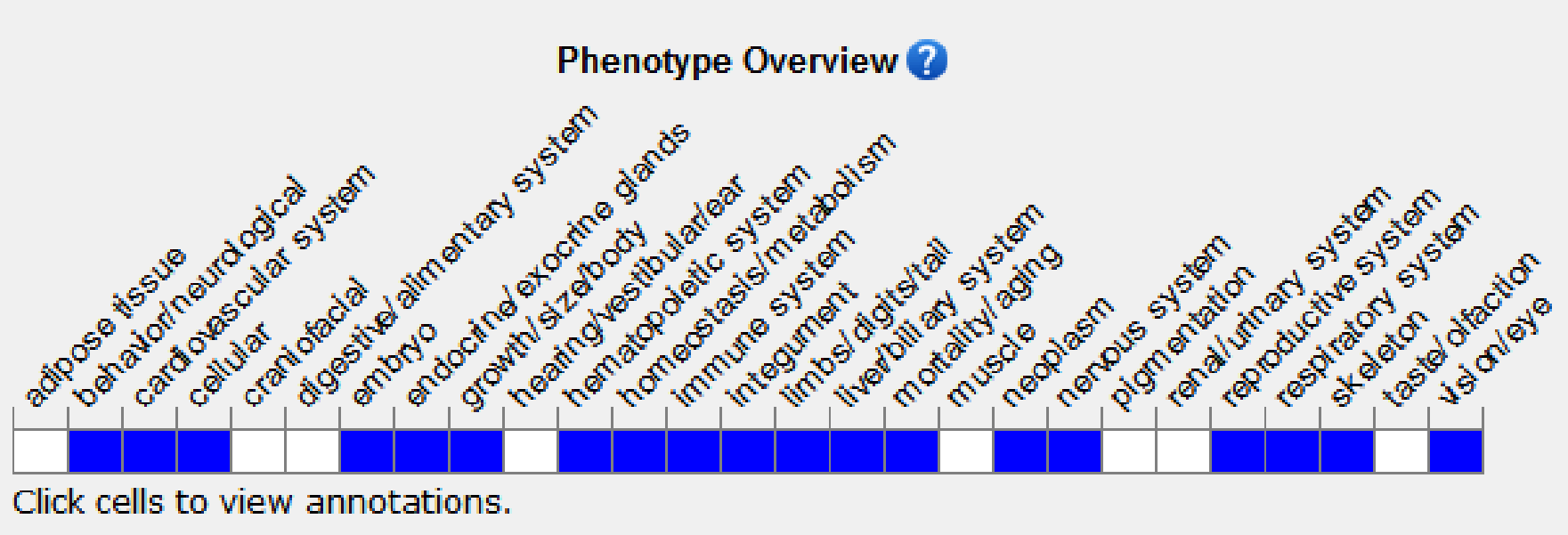
# Genomic location distribution



# 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/) .*

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

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