

Ep^{or} Cas9-CKO Strategy

Designer: Zihe Cui

Reviewer: Ruirui Zhang

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Project Overview

Project Name

Ep^{or}

Project type

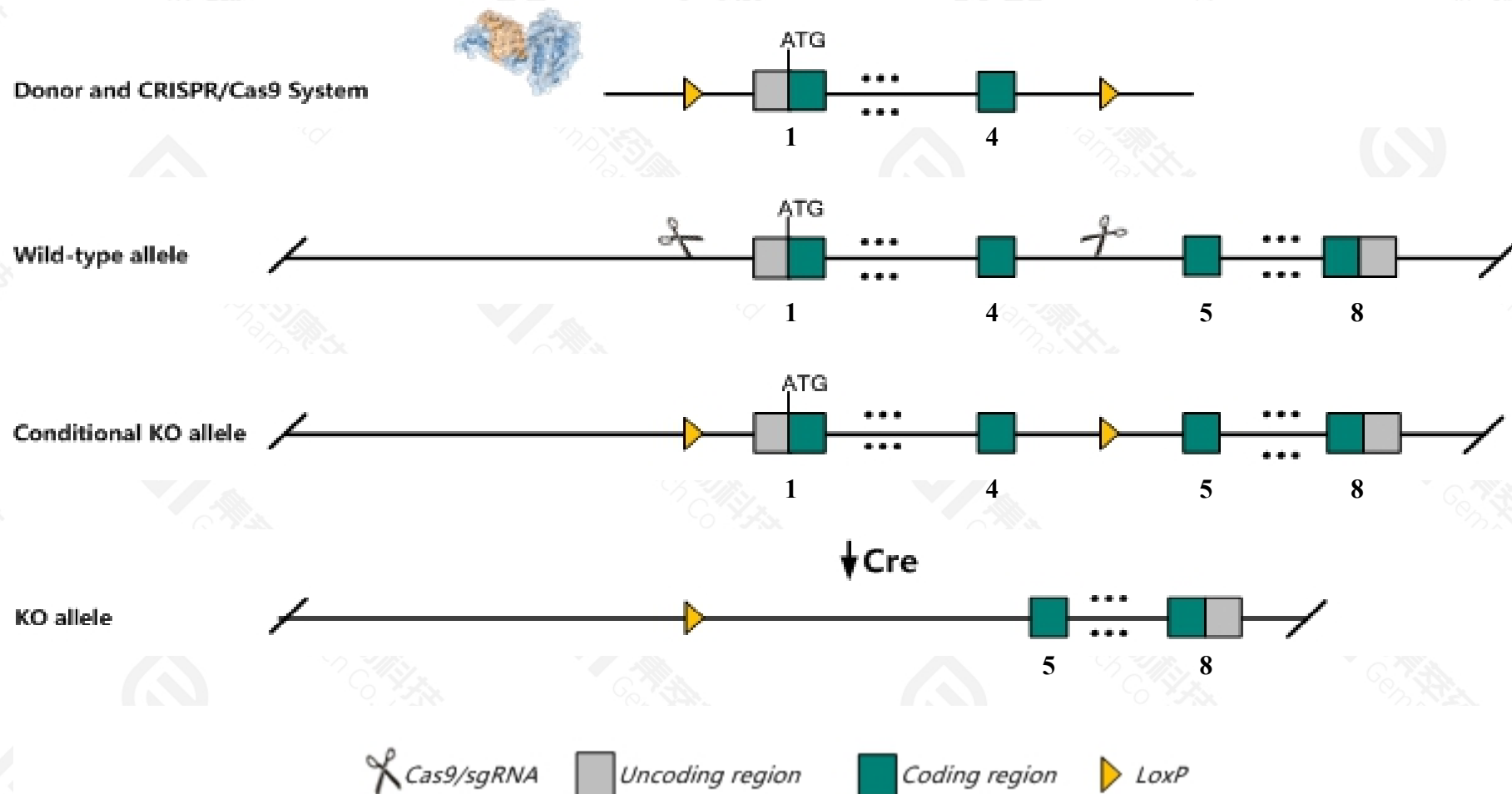
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

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



LoxP sequences were inserted into the endogenous *Epor* locus 1.7kb upstream of exon 1 and in the intron4-5 near the EcoRV.

Technical routes

- The *Epor* gene has 2 transcripts. According to the structure of *Epor* gene, exon1-exon4 of *Epor-201*(ENSMUST00000006397.7) transcript is recommended as the knockout region. The region contains start codon ATG. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Epor* gene. The brief process is as follows: sgRNA was transcribed in vitro, donor 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 and cell types.

- According to the existing MGI data, mutations in this locus affect erythropoiesis. Targeted null mutants die at embryonic day 11-12.5 with severe anemia. Mutants with truncated alleles are viable with mild changes in erythropoiesis. A human mutation replacement allele produces polycythemia.
- The *Epor* gene is located on the Chr9. 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)

Epor erythropoietin receptor [*Mus musculus* (house mouse)]

Gene ID: 13857, updated on 29-Mar-2021

[Download Datasets](#)

Summary

Official Symbol Epor provided by [MGI](#)
Official Full Name erythropoietin receptor provided by [MGI](#)
Primary source [MGI:MGI:95408](#)
See related [Ensembl:ENSMUSG000000006235](#)
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
Expression Biased expression in liver E14.5 (RPKM 73.4), liver E14 (RPKM 57.8) and 5 other tissues [See more](#)
Orthologs [human](#) [all](#)

NEW

Try the new [Gene table](#)

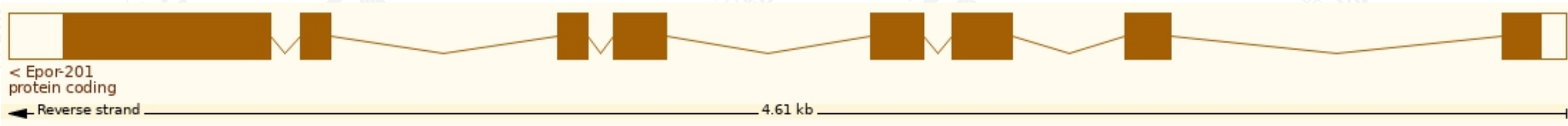
Try the new [Transcript table](#)

Transcript information (Ensembl)

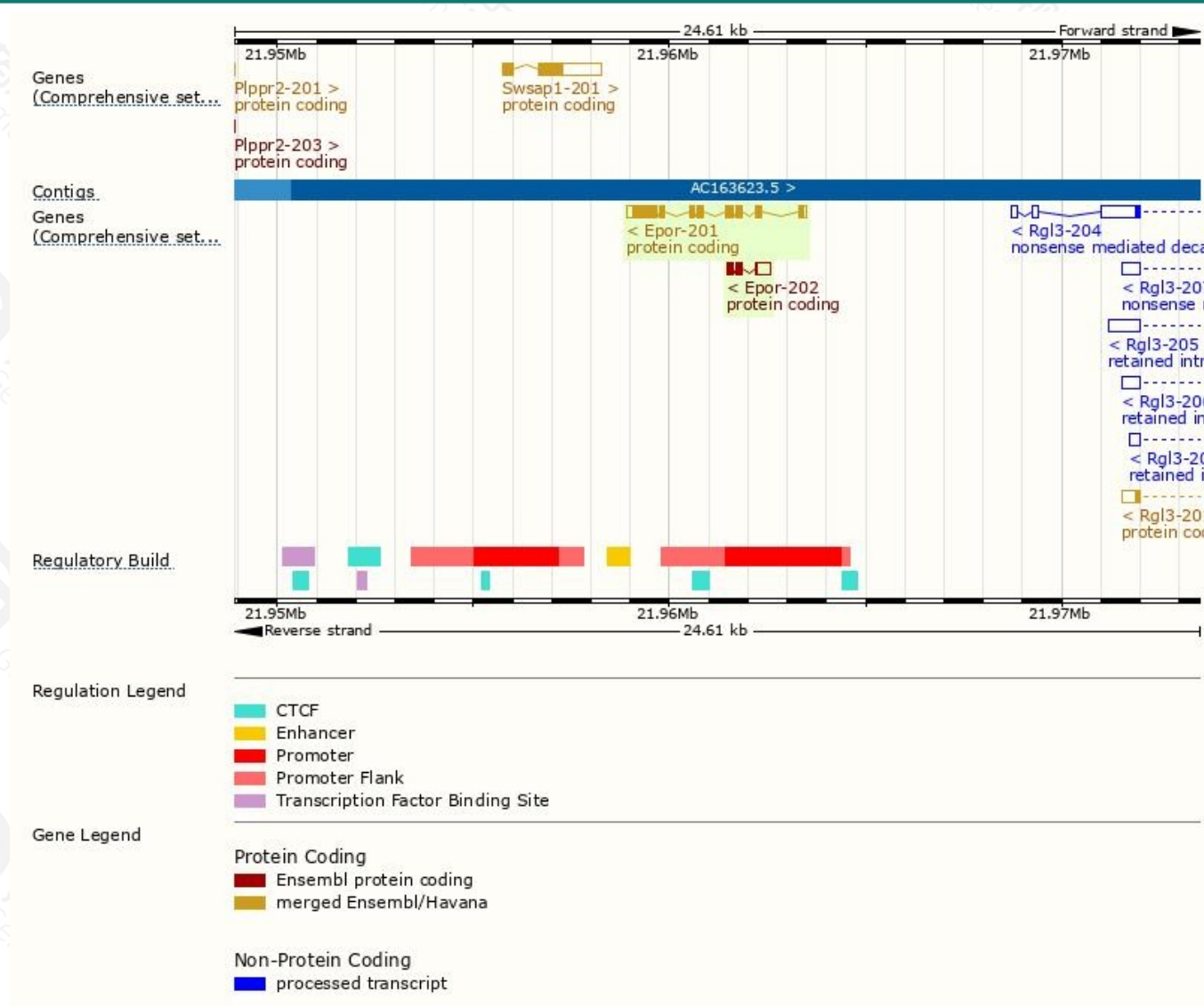
The gene has 2 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Epor-201	ENSMUST00000006397.7	1761	507aa	Protein coding	CCDS22915		TSL:1 , GENCODE basic , APPRIS P1 ,
Epor-202	ENSMUST00000213181.2	659	111aa	Protein coding	-		CDS 3' incomplete , TSL:2 ,

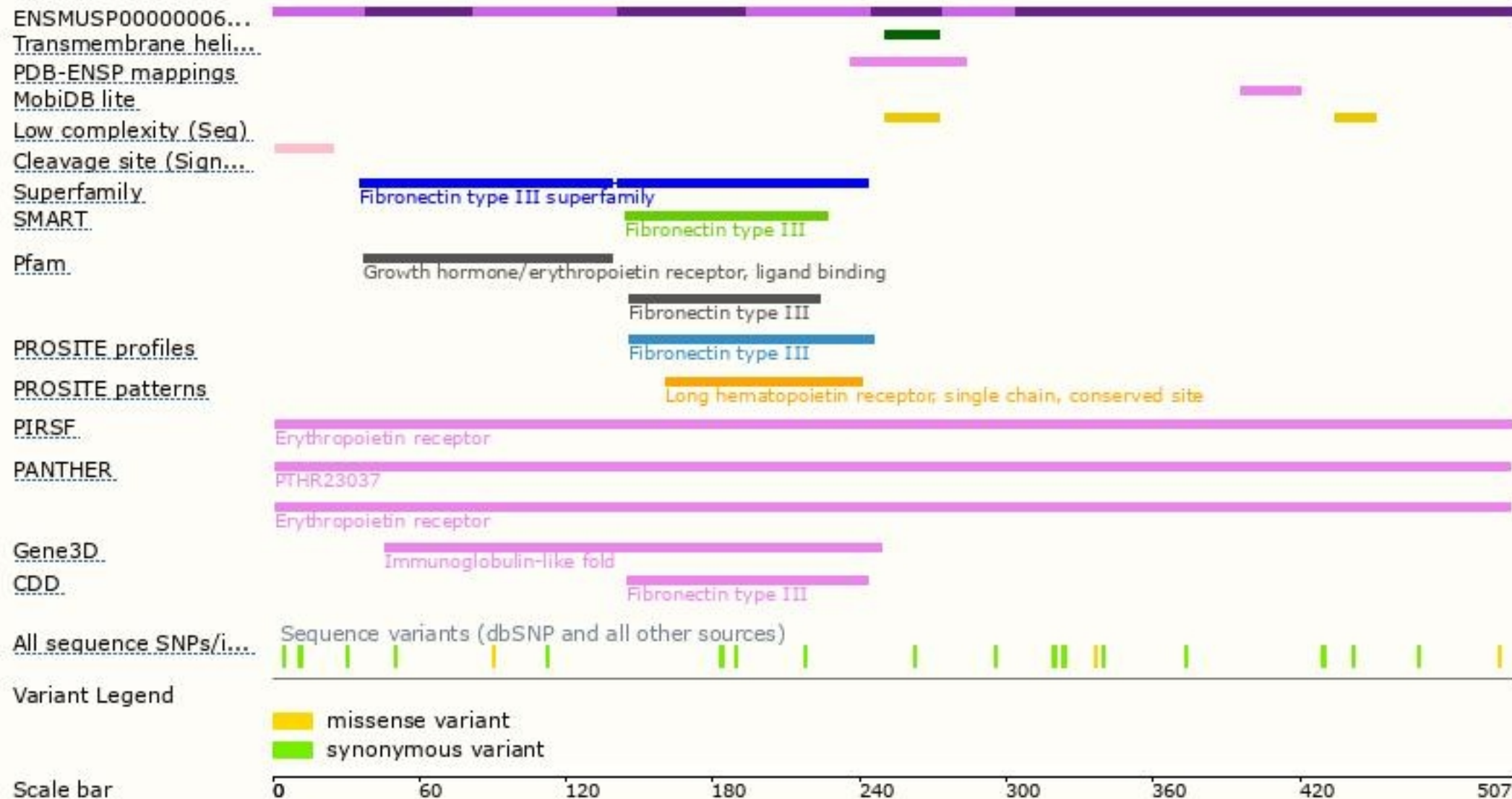
The strategy is based on the design of *Epor-201* transcript,the transcription is shown below:



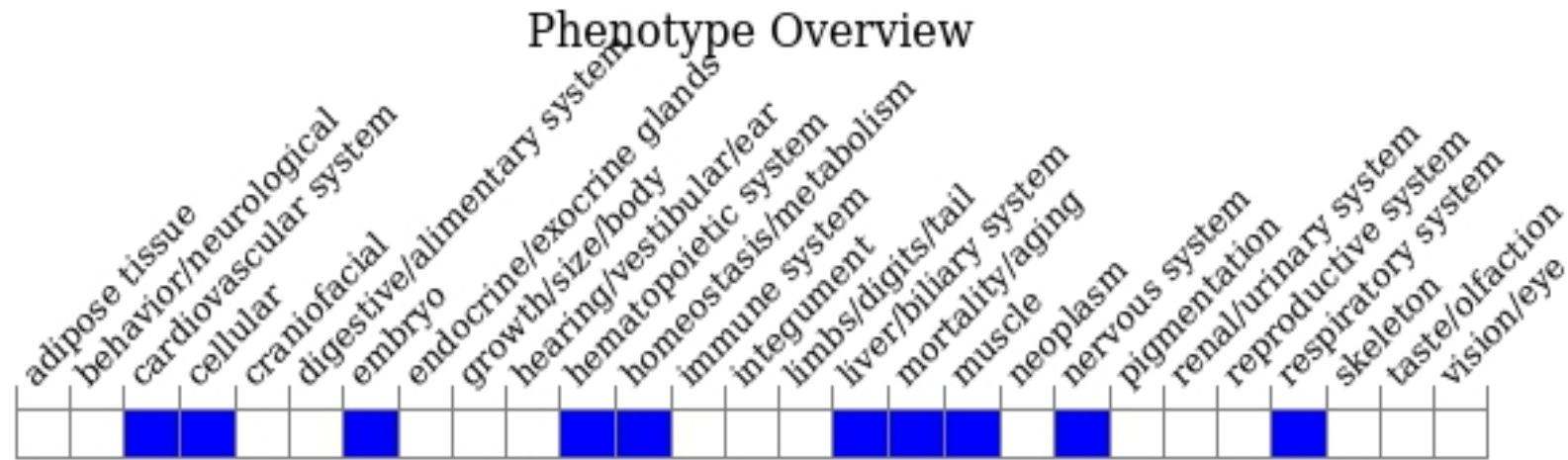
Genomic location distribution



Protein domain



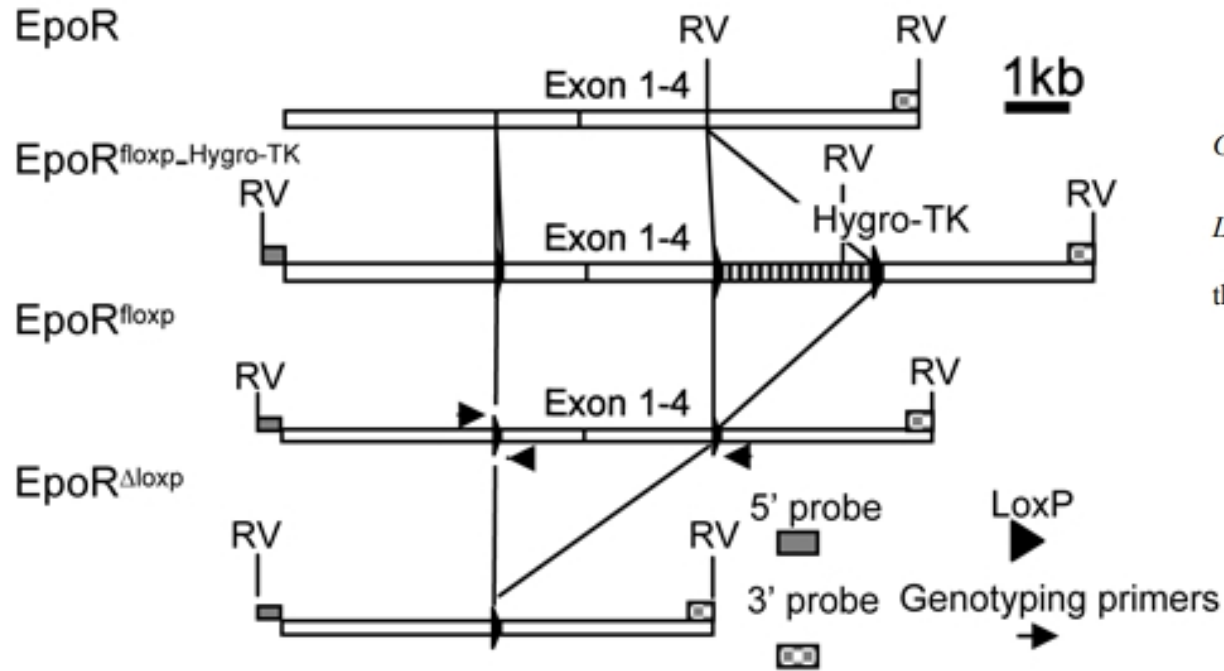
Mouse phenotype description(MGI)



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, mutations in this locus affect erythropoiesis. Targeted null mutants die at embryonic day 11-12.5 with severe anemia. Mutants with truncated alleles are viable with mild changes in erythropoiesis. A human mutation replacement allele produces polycythemia.

Reference



Generation of *hGFAP-Cre;EpoR^{flox/flox}* and *hGFAP-Cre;EpoR^{flox/-}* mice.

LoxP sequences were inserted into the endogenous *EpoR* locus 1.7kb upstream of exon 1 and in the intron 4 to generate *pEpoR-floxHyTK* targeting construct. *pEpoR-floxHyTK* was

Tsai P T , Ohab J J , N Kertesz, et al. A Critical Role of Erythropoietin Receptor in Neurogenesis and Post-Stroke Recovery[J]. JOURNAL OF NEUROSCIENCE, 2006.

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

Tel: 025-5864 1534

