

# *F13a1* Cas9-KO Strategy

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**Reviewer:**

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# Project Overview

**Project Name**

***F13a1***

**Project type**

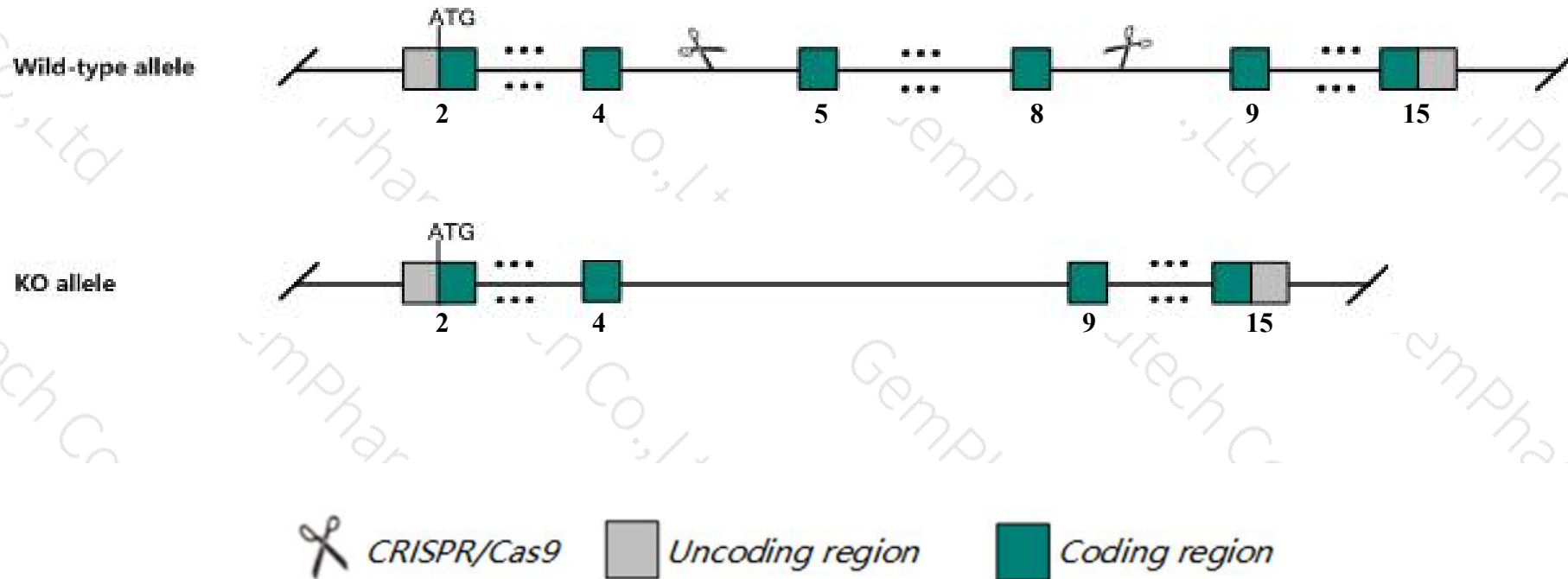
**Cas9-KO**

**Strain background**

**C57BL/6JGpt**

# Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *F13a1* gene. The schematic diagram is as follows:



- The *F13a1* gene has 5 transcripts. According to the structure of *F13a1* gene, exon5-exon8 of *F13a1-201* (ENSMUST00000037491.9) transcript is recommended as the knockout region. The region contains 541bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *F13a1* gene. The brief process is as follows: CRISPR/Cas9 system

- According to the existing MGI data, Homozygous mutant mice exhibit bleeding symptoms, increased lethality, and impaired fertility.
- The KO region contains functional region of the *Gm30489* gene. Knockout the region may affect the function of *Gm30489* gene.
- The *F13a1* gene is located on the Chr13. 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 gene knockout on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.



# Gene information (NCBI)

## F13a1 coagulation factor XIII, A1 subunit [Mus musculus (house mouse)]

Gene ID: 74145, updated on 31-Jan-2019

### Summary



**Official Symbol** F13a1 provided by [MGI](#)

**Official Full Name** coagulation factor XIII, A1 subunit provided by [MGI](#)

**Primary source** [MGI:MGI:1921395](#)

**See related** [Ensembl:ENSMUSG00000039109](#)

**Gene type** protein coding

**RefSeq status** REVIEWED

**Organism** [Mus musculus](#)

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

**Also known as** 1200014I03Rik, AI462306, F13a

**Summary** This gene encodes subunit A of the coagulation factor XIII that catalyzes the final step of the blood coagulation pathway. The encoded protein associates with subunit B to form a heterotetrameric proenzyme that undergoes thrombin-mediated proteolysis to generate active factor XIIIa. The transglutaminase activity of factor XIIIa is required for the calcium-dependent crosslinking of fibrin, leading to the formation of a clot. Mice lacking the encoded protein display impaired reproduction and reduced survival due to bleeding episodes, hemothorax, hemoperitoneum and subcutaneous hemorrhage. Additionally, mice lacking the encoded protein exhibit impaired wound healing and inadequate healing of myocardial infarction. Alternative splicing results in multiple transcript variants. [provided by RefSeq, Sep 2015]

**Expression** Broad expression in bladder adult (RPKM 12.1), mammary gland adult (RPKM 11.7) and 17 other tissues [See more](#)

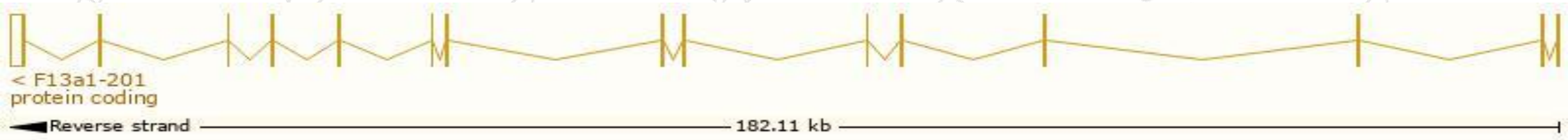
**Orthologs** [human](#) [all](#)

# Transcript information (Ensembl)

The gene has 5 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
F13a1-201	<a href="#">ENSMUST00000037491.9</a>	3952	<a href="#">732aa</a>	Protein coding	<a href="#">CCDS26456</a>	<a href="#">Q8BH61</a>	TSL:1 GENCODE basic APPRIS P1
F13a1-202	<a href="#">ENSMUST00000164727.7</a>	3854	<a href="#">732aa</a>	Protein coding	<a href="#">CCDS26456</a>	<a href="#">Q8BH61</a>	TSL:1 GENCODE basic APPRIS P1
F13a1-203	<a href="#">ENSMUST00000224446.1</a>	2965	No protein	lncRNA	-	-	
F13a1-204	<a href="#">ENSMUST00000224783.1</a>	1509	No protein	lncRNA	-	-	
F13a1-205	<a href="#">ENSMUST00000225168.1</a>	1110	No protein	lncRNA	-	-	

The strategy is based on the design of *F13a1-201* transcript,The transcription is shown below

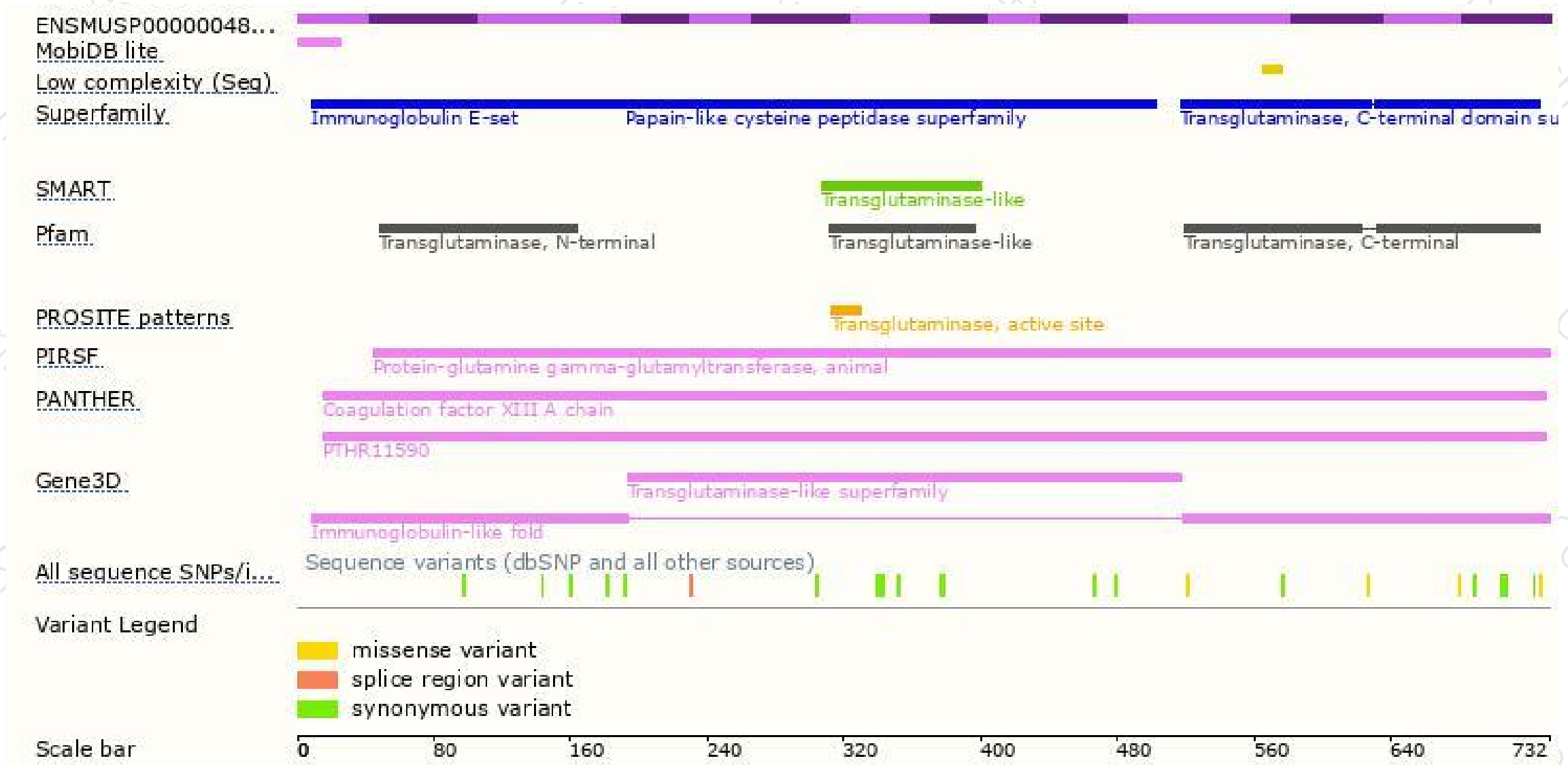


# Genomic location distribution

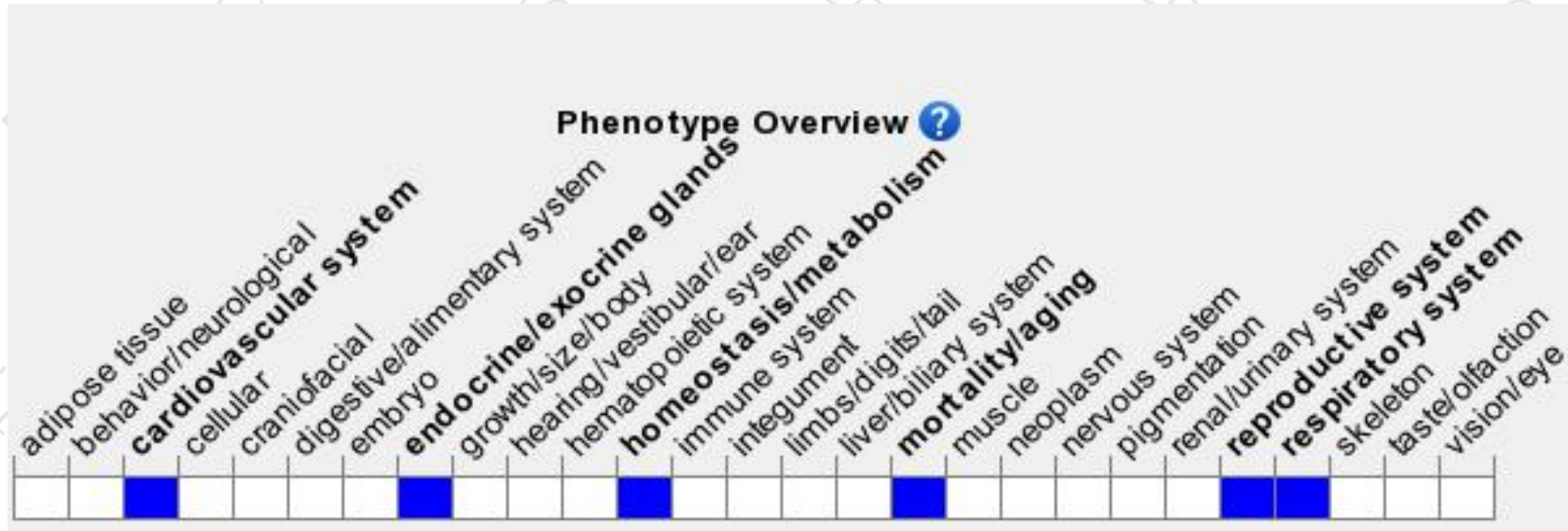




# Protein domain



# 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, Homozygous mutant mice exhibit bleeding symptoms, increased lethality, and impaired fertility.

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

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