Spred1 Cas9-CKO Strategy

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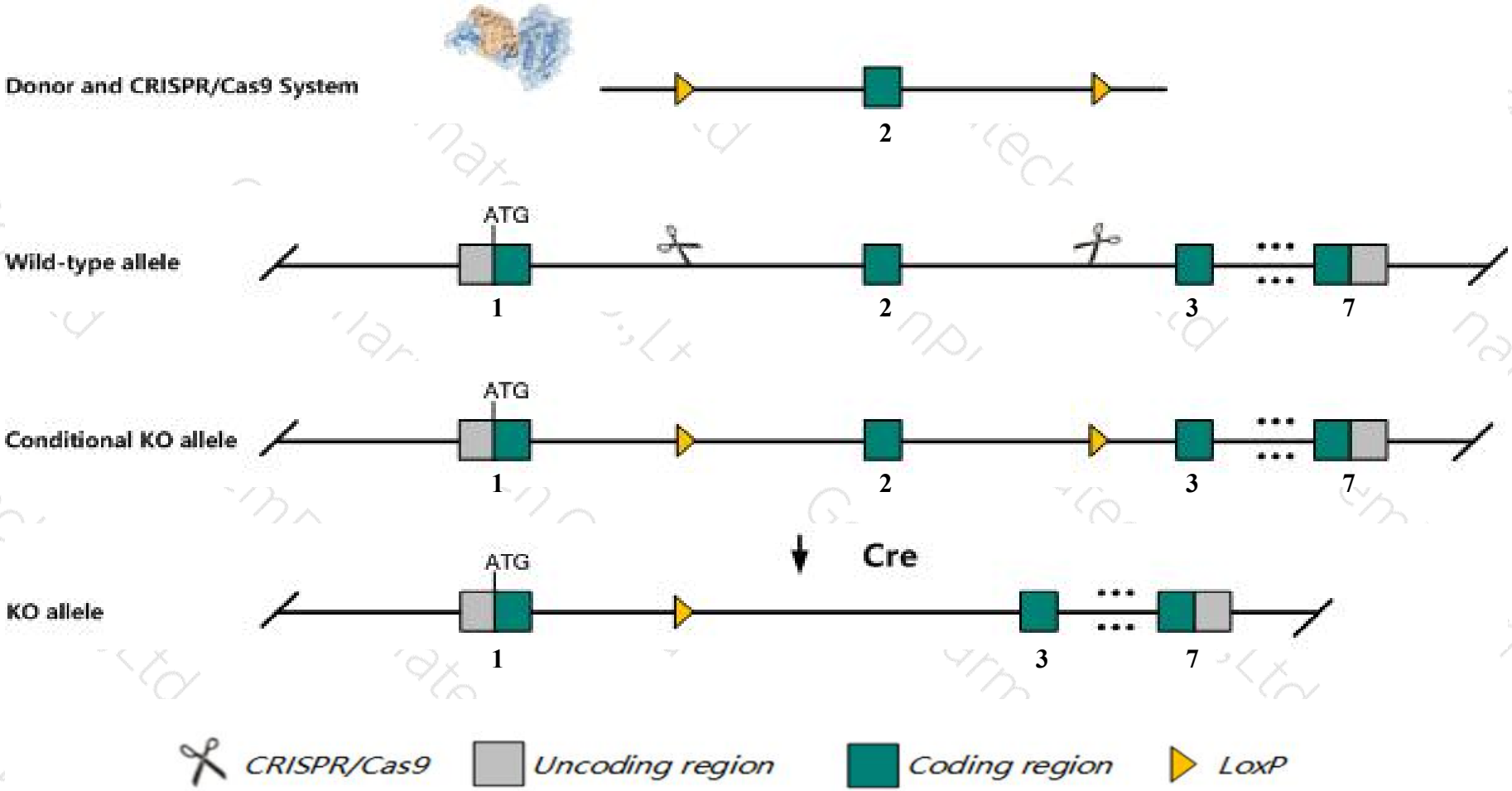
Date:2020-1-17

Project Overview

Project Name	***Spred1***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Spred1* gene. The schematic diagram is as follows:



Technical routes

- The *Spred1* gene has 2 transcripts. According to the structure of *Spred1* gene, exon2 of *Spred1-201* (ENSMUST00000028829.12) transcript is recommended as the knockout region.The region contains 175bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Spred1* 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.

Notice

- According to the existing MGI data,Homozygous null mice display increased airway hyperresponsiveness, eosinophilia, a kinked tail, shortened face, impaired spatial learning and memory, and altered CNS transmission.

- The *Spred1* gene is located on the Chr2. 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）

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Spred1 sprouty protein with EVH-1 domain 1, related sequence [*Mus musculus* (house mouse)]

Gene ID: 114715, updated on 14-Oct-2019

Summary

Official Symbol	Spred1 provided by MGI
Official Full Name	sprouty protein with EVH-1 domain 1, related sequence provided by MGI
Primary source	MGI:MGI:2150016
See related	Ensembl:ENSMUSG00000027351
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	AL024345; AW047647; 5730461F13Rik
Summary	This gene encodes a membrane-associated protein that is phosphorylated by tyrosine kinases in response to growth factors. The encoded protein acts as a negative regulator of the mitogen-activated protein (MAP) kinase signaling pathway. Alternative splicing results in multiple transcript variants. [provided by RefSeq, Mar 2013]
Expression	Ubiquitous expression in adrenal adult (RPKM 12.0), cortex adult (RPKM 10.9) and 27 other tissues See more
Orthologs	human all

Genomic context

Location: 2; 2 E5

See Spred1 in Genome Data Viewer

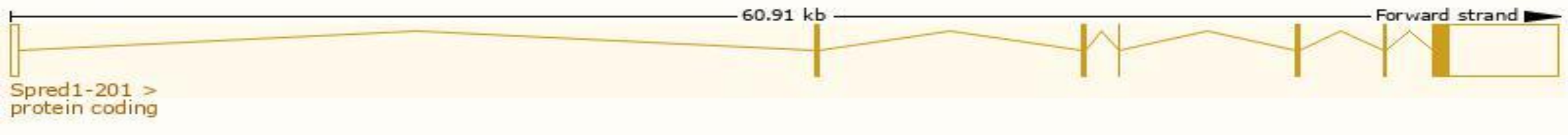
Exon count: 7

Transcript information（Ensembl）

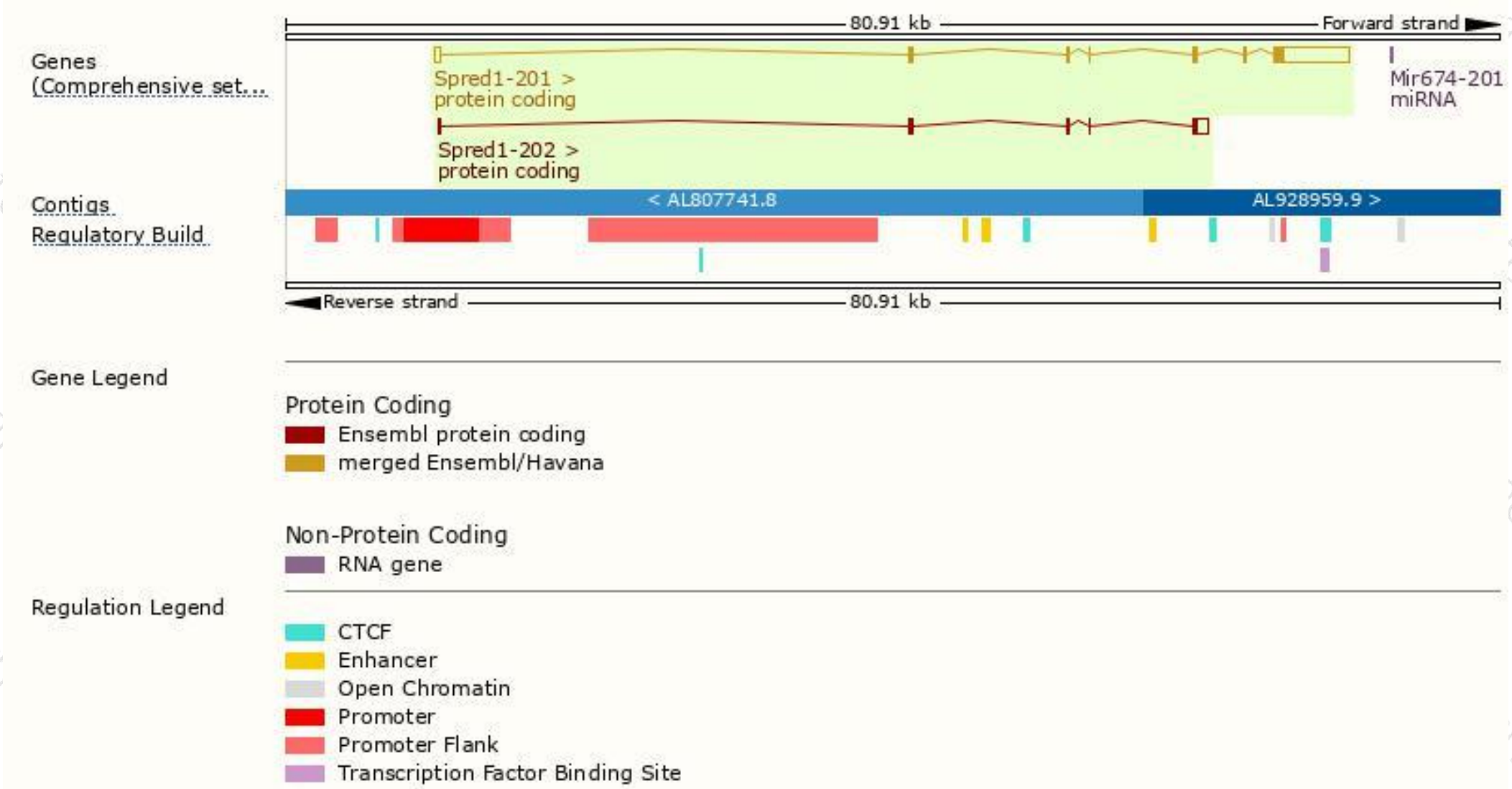
The gene has 2 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Spred1-201	ENSMUST00000028829.12	6016	444aa	Protein coding	CCDS16570	Q924S8	TSL:1 GENCODE basic APPRIS P1
Spred1-202	ENSMUST00000110901.1	1440	229aa	Protein coding	CCDS71115	Q924S8	TSL:1 GENCODE basic

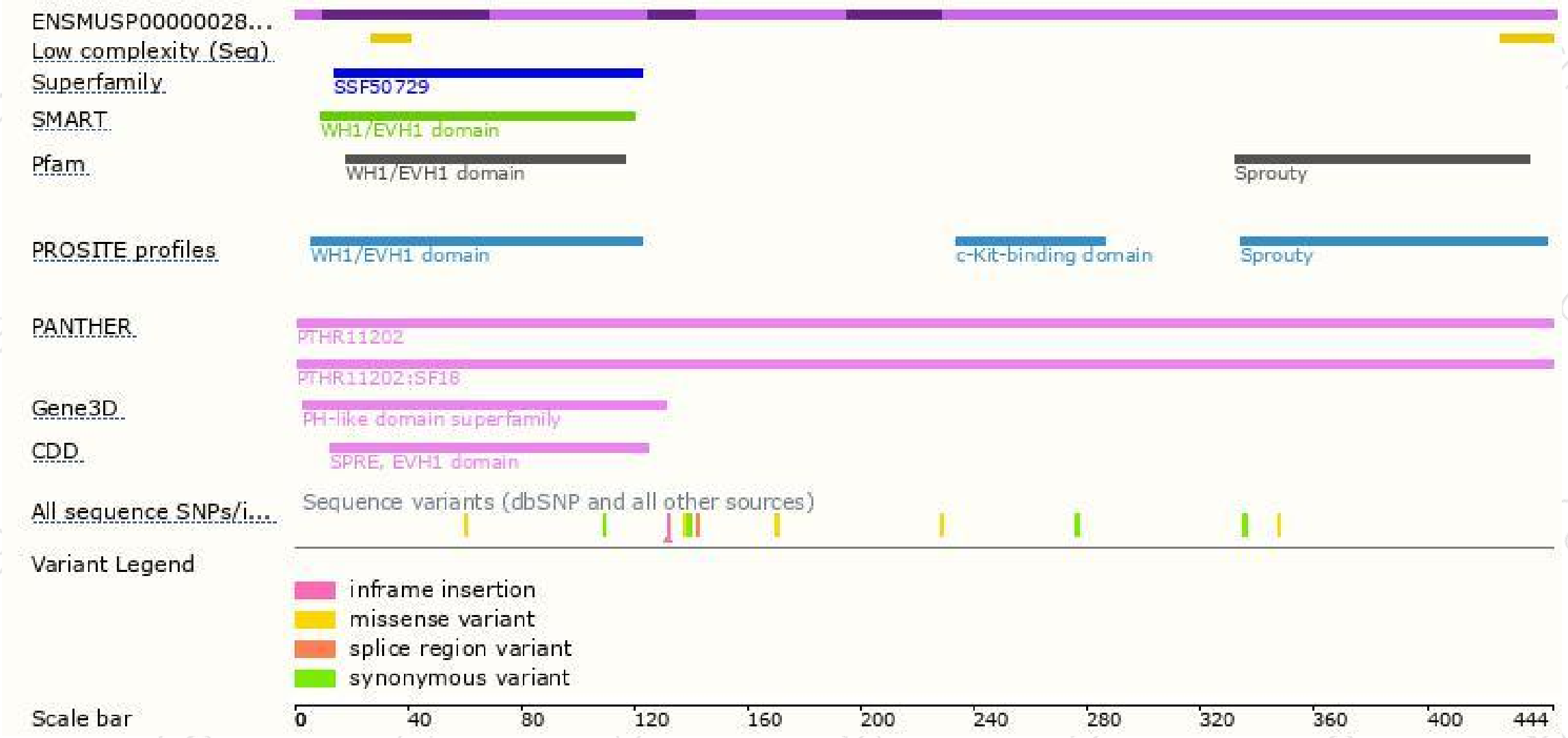
The strategy is based on the design of *Spred1-201* transcript,The transcription is shown below



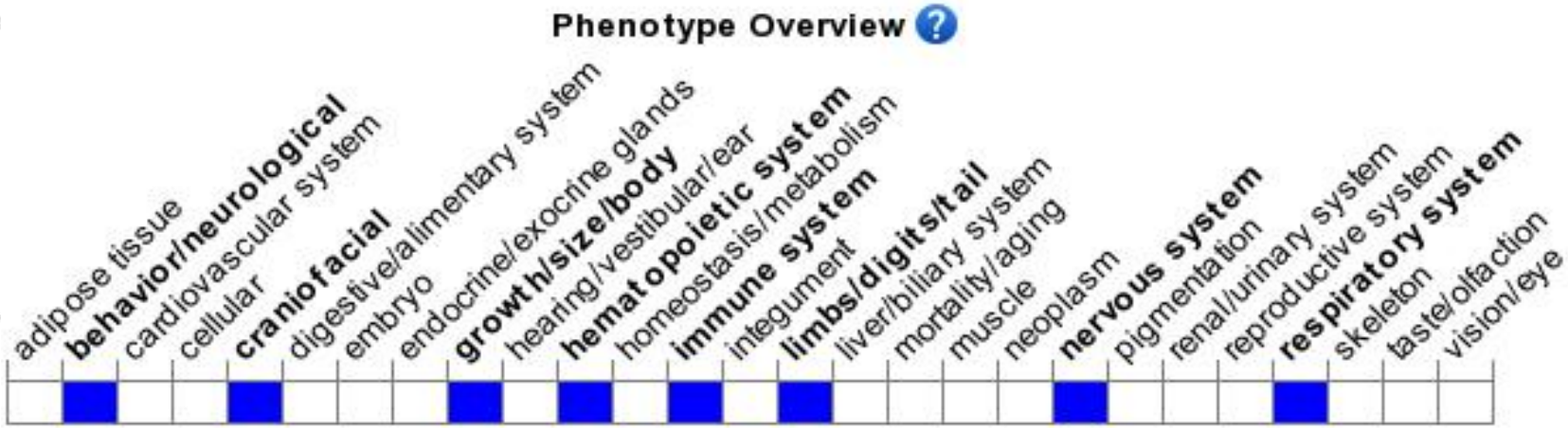
Genomic location distribution



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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