Jak1 Cas9-CKO Strategy

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Project Overview

Project Name	***Jak1***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

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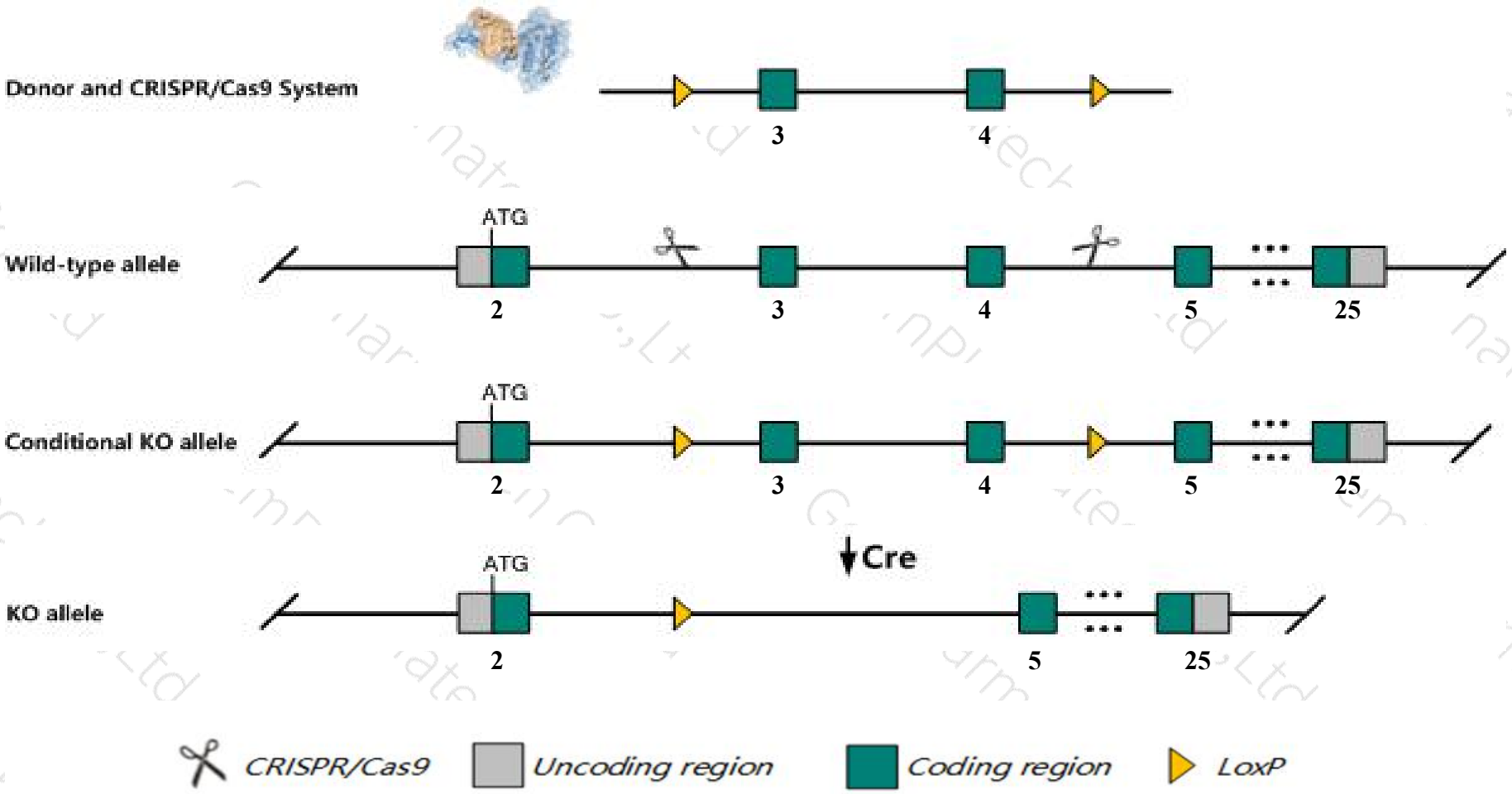
This model will use CRISPR/Cas9 technology to edit the *Jak1* gene. The schematic diagram is as follows:



Technical routes

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- The *Jak1* gene has 8 transcripts. According to the structure of *Jak1* gene, exon3-exon4 of *Jak1-201* (ENSMUST00000102781.9) transcript is recommended as the knockout region.The region contains 323bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Jak1* 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,mice homozygous for disruption of this gene die within the first 24 hours after birth.

- The distance between gene *Gm24468* and exon4 of *Jak1-201* is about 2kb, this strategy may affect the regulatory function of *Gm24468* gene.

- The *Jak1* gene is located on the Chr4. 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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Jak1 Janus kinase 1 [*Mus musculus* (house mouse)]

Gene ID: 16451, updated on 14-Dec-2019

Summary

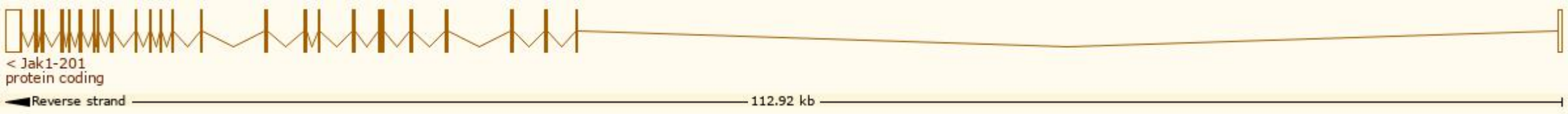
Official Symbol	Jak1 provided by MGI
Official Full Name	Janus kinase 1 provided by MGI
Primary source	MGI:MGI:96628
See related	Ensembl:ENSMUSG00000028530
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	BAP004; AA960307; C130039L05Rik
Expression	Ubiquitous expression in thymus adult (RPKM 28.5), spleen adult (RPKM 26.3) and 28 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

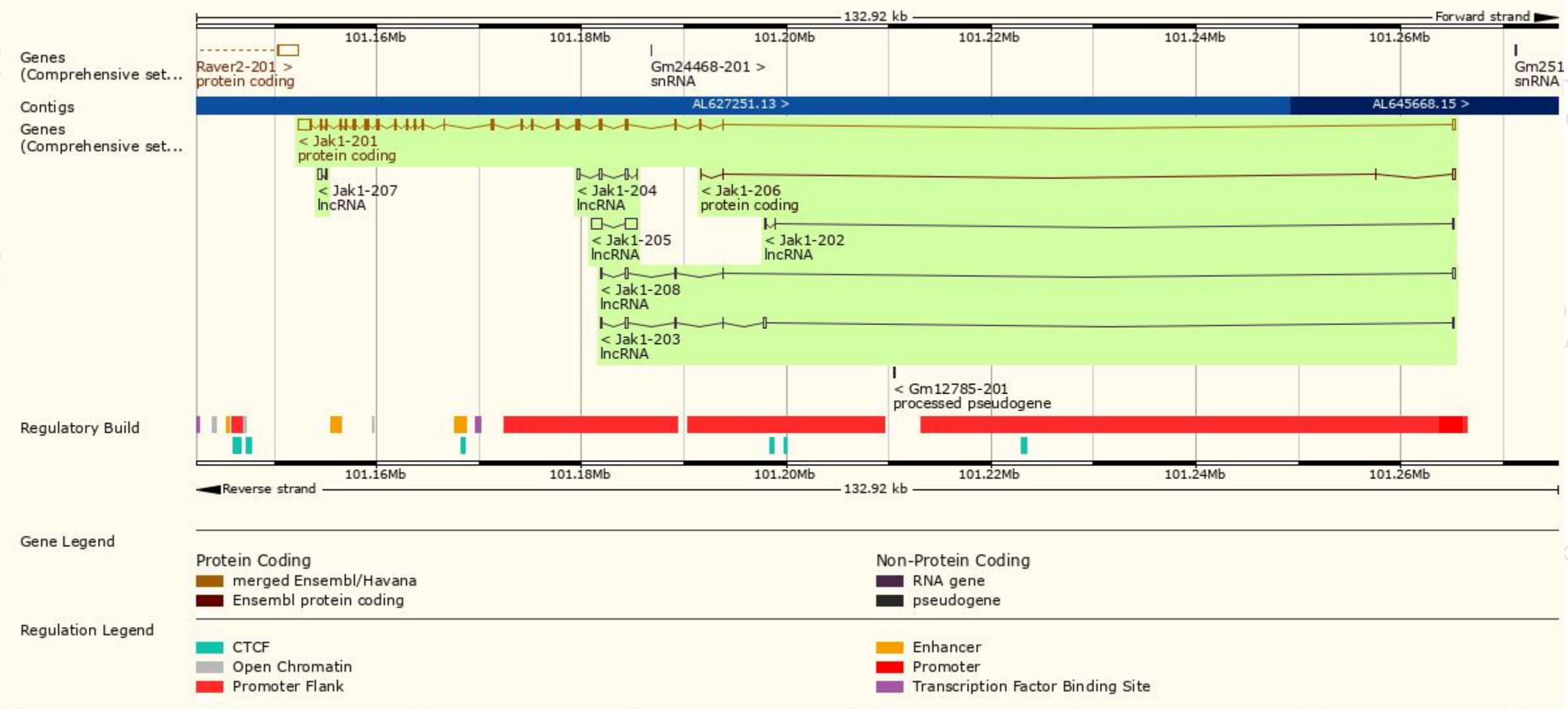
The gene has 8 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Jak1-201	ENSMUST00000102781.9	4906	1153aa	Protein coding	CCDS18393	B1ASP2	TSL:1 GENCODE basic APPRIS P1
Jak1-202	ENSMUST00000125968.1	374	No protein	lncRNA	-	-	TSL:3
Jak1-203	ENSMUST00000132292.1	778	No protein	lncRNA	-	-	TSL:5
Jak1-204	ENSMUST00000136167.7	589	No protein	lncRNA	-	-	TSL:3
Jak1-205	ENSMUST00000147211.1	2039	No protein	lncRNA	-	-	TSL:1
Jak1-206	ENSMUST00000149297.1	421	18aa	Protein coding	-	B1ASP3	CDS 3' incomplete TSL:3
Jak1-207	ENSMUST00000151235.1	504	No protein	lncRNA	-	-	TSL:1
Jak1-208	ENSMUST00000155328.7	671	No protein	lncRNA	-	-	TSL:5

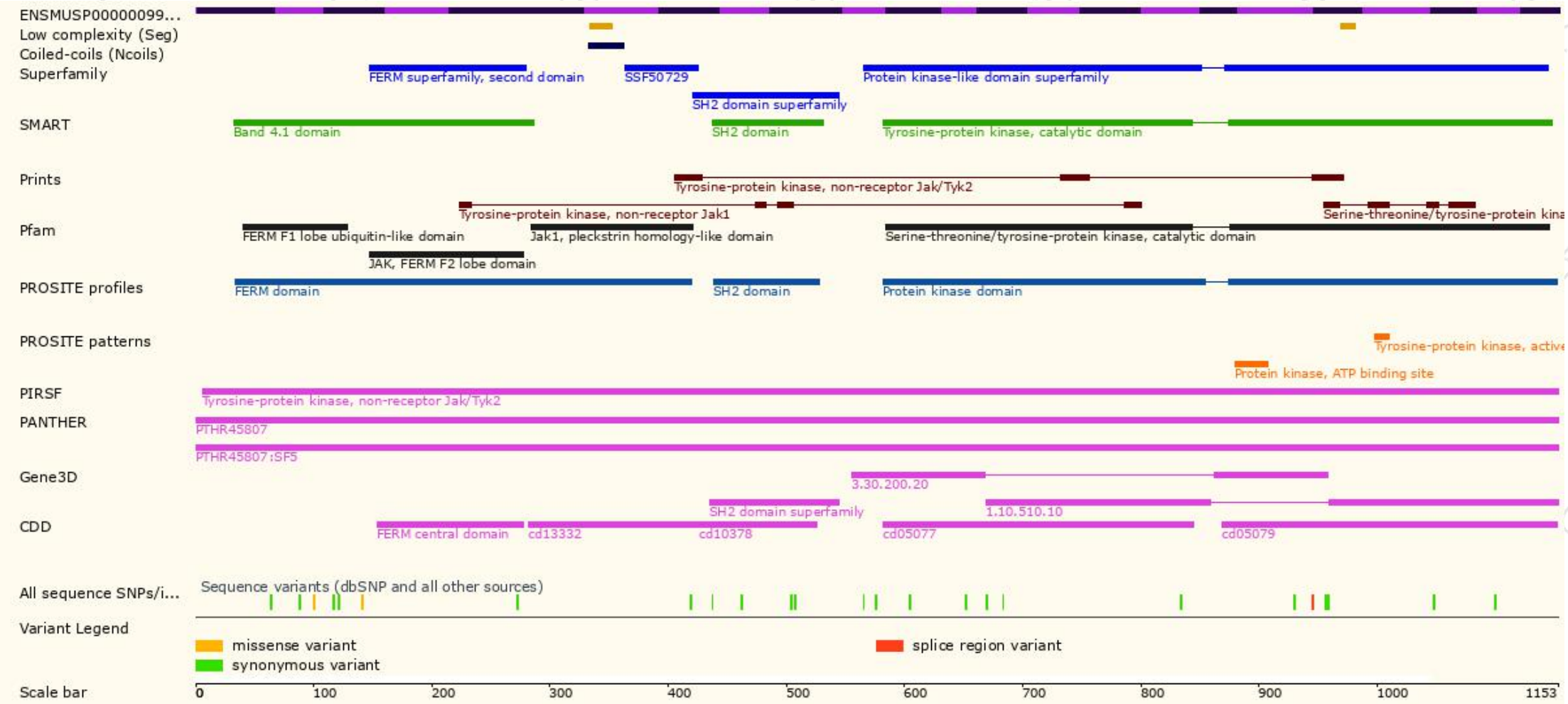
The strategy is based on the design of *Jak1-201* transcript, the transcription is shown below:



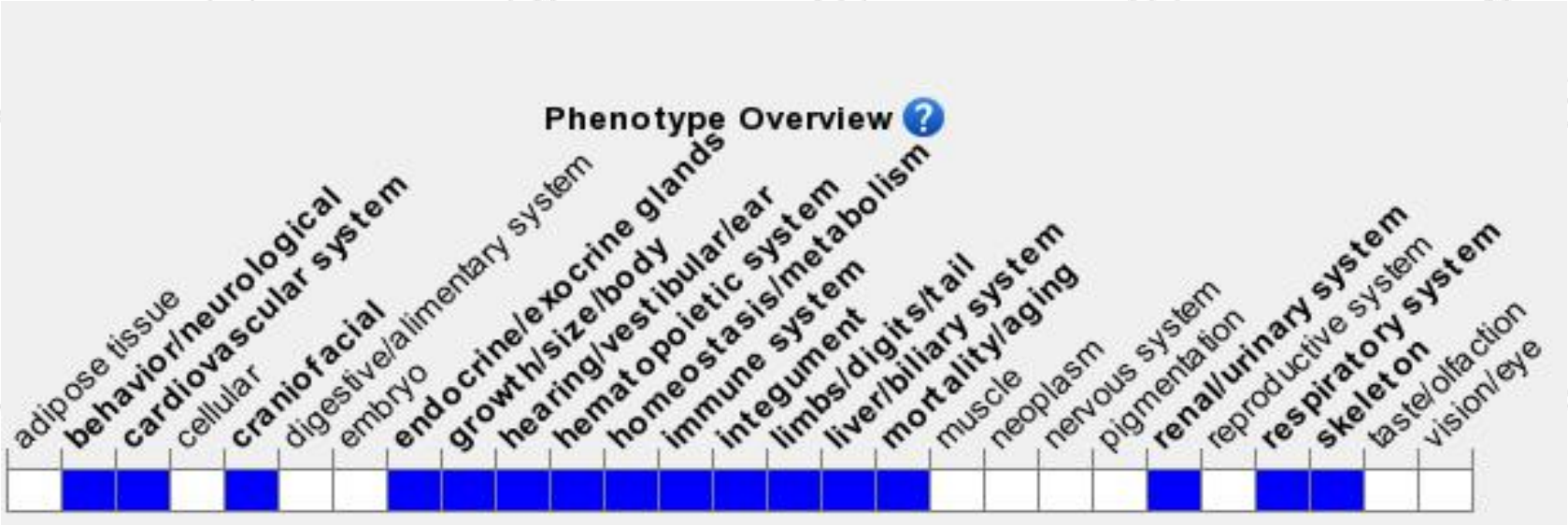
Genomic location distribution



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,Mice homozygous for disruption of this gene die within the first 24 hours after birth.

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