Senp1 Cas9-KO Strategy

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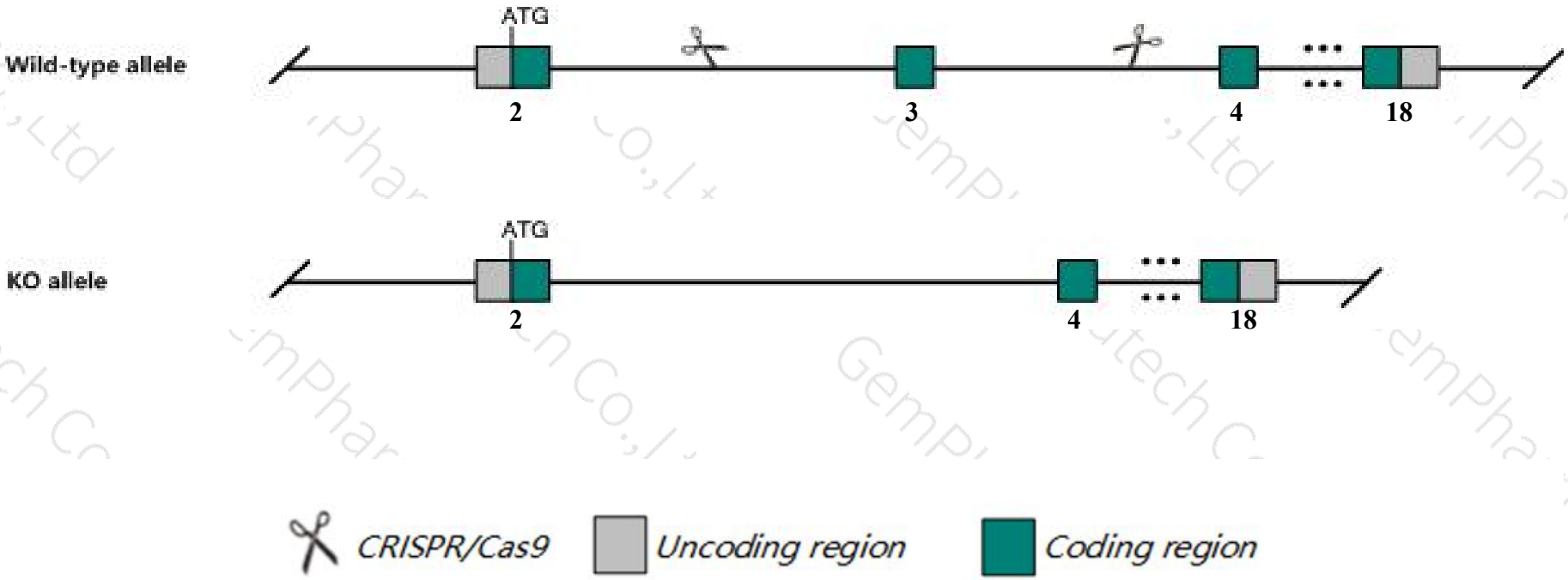
Project Overview

Project Name	***Senp1***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Senp1* gene. The schematic diagram is as follows:



Technical routes

➢ The *Senp1* gene has 9 transcripts. According to the structure of *Senp1* gene, exon3 of *Senp1-201* (ENSMUST00000044189.15) transcript is recommended as the knockout region.The region contains 131bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Senp1* gene. The brief process is as follows: CRISPR/Cas9 system

Notice

- According to the existing MGI data, Homozygous mutant mice die before birth. Depending on the allele mice may exhibit placental labyrinth defects and widespread cell death or severe anemia and a defect in definitive erythropoiesis in the fetal liver.

- Transcript *Senp1-202/203/207/208* may not be affected.

- The *Senp1* gene is located on the Chr15. 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）

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Senp1 SUMO1/sentrin specific peptidase 1 [*Mus musculus* (house mouse)]

Gene ID: 223870, updated on 21-Aug-2019

Summary

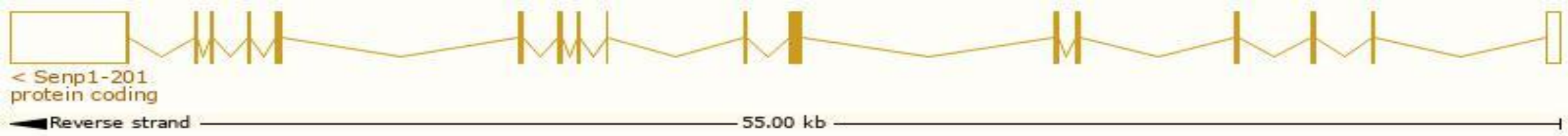
Official Symbol	Senp1 provided by MGI
Official Full Name	SUMO1/sentrin specific peptidase 1 provided by MGI
Primary source	MGI:MGI:2445054
See related	Ensembl:ENSMUSG00000033075
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	suPr-2; D15Ertd528e; 2310046A20Rik; E330036L07Rik
Expression	Ubiquitous expression in testis adult (RPKM 9.4), thymus adult (RPKM 9.2) and 28 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

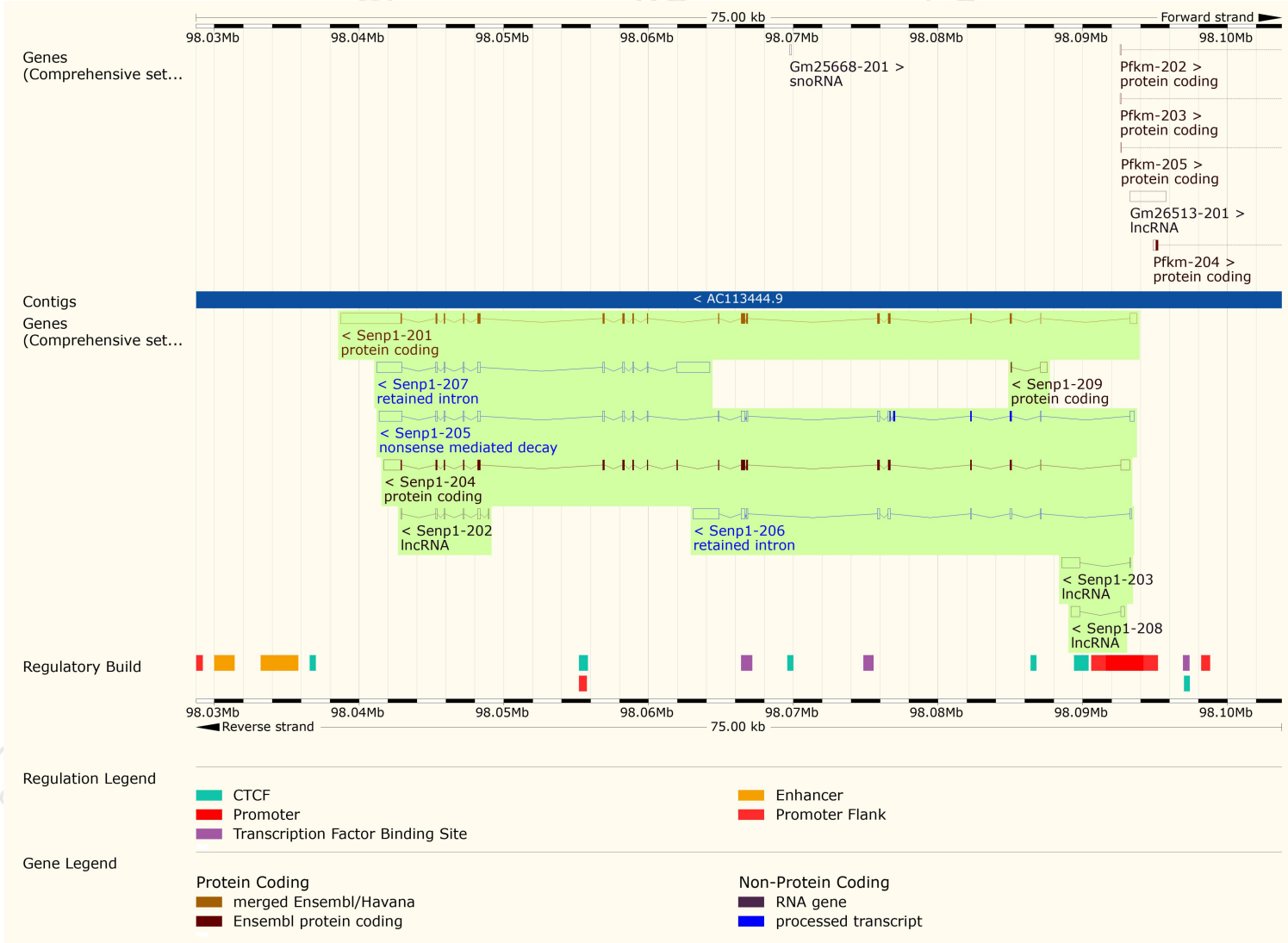
The gene has 9 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Senp1-201	ENSMUST00000044189.15	6575	640aa	Protein coding	CCDS49717	P59110	TSL:1 GENCODE basic APPRIS P2
Senp1-204	ENSMUST00000180657.1	3806	666aa	Protein coding	-	M0QWX4	TSL:1 GENCODE basic APPRIS ALT2
Senp1-209	ENSMUST00000183105.1	518	21aa	Protein coding	-	S4R1V9	CDS 3' incomplete TSL:3
Senp1-205	ENSMUST00000180716.7	3882	130aa	Nonsense mediated decay	-	M0QWV7	TSL:5
Senp1-203	ENSMUST00000180531.1	1270	No protein	Processed transcript	-	-	TSL:1
Senp1-208	ENSMUST00000182611.1	853	No protein	Processed transcript	-	-	TSL:3
Senp1-202	ENSMUST00000180461.1	568	No protein	Processed transcript	-	-	TSL:3
Senp1-207	ENSMUST00000181855.7	4886	No protein	Retained intron	-	-	TSL:2
Senp1-206	ENSMUST00000181349.1	2830	No protein	Retained intron	-	-	TSL:1

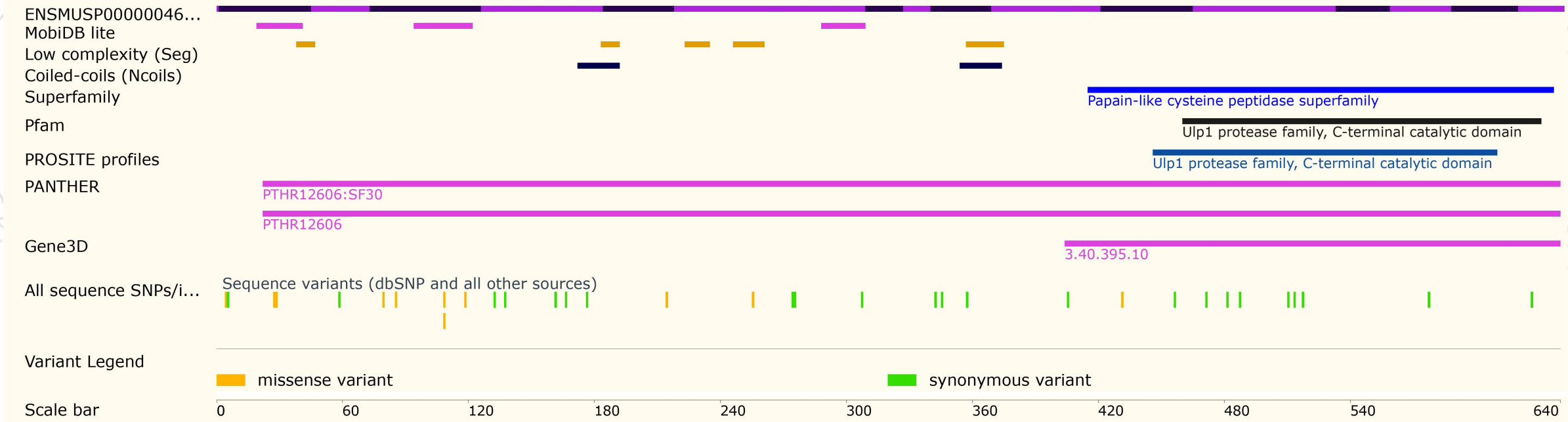
The strategy is based on the design of *Senp1-201* transcript,The transcription is shown below



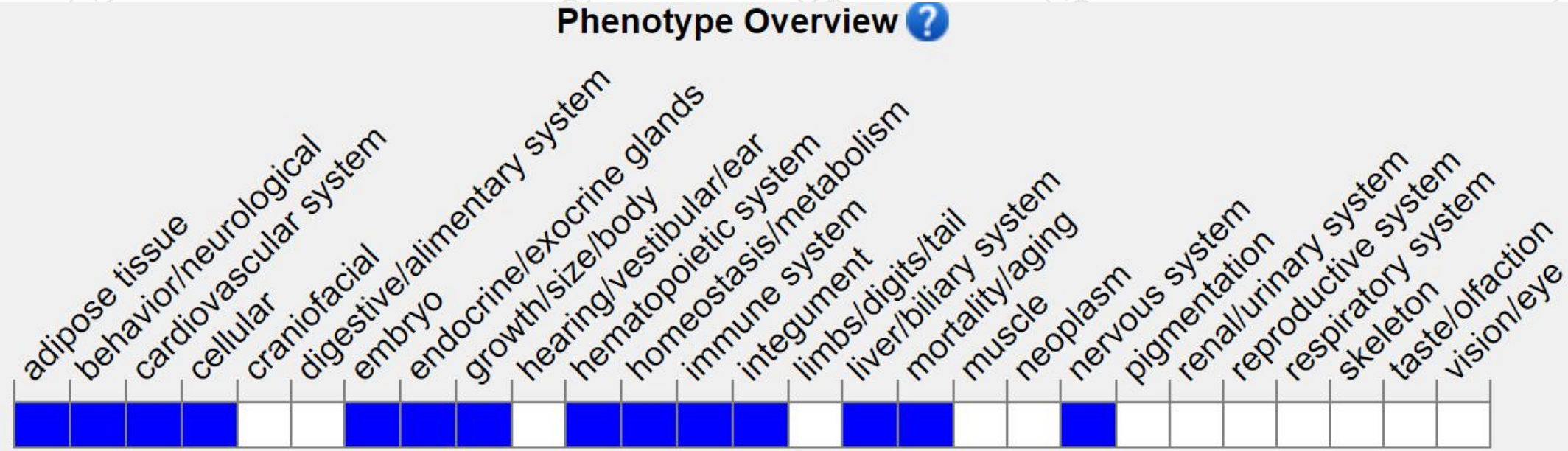
Genomic location distribution



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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