Xrcc6 Cas9-KO Strategy

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Project Overview

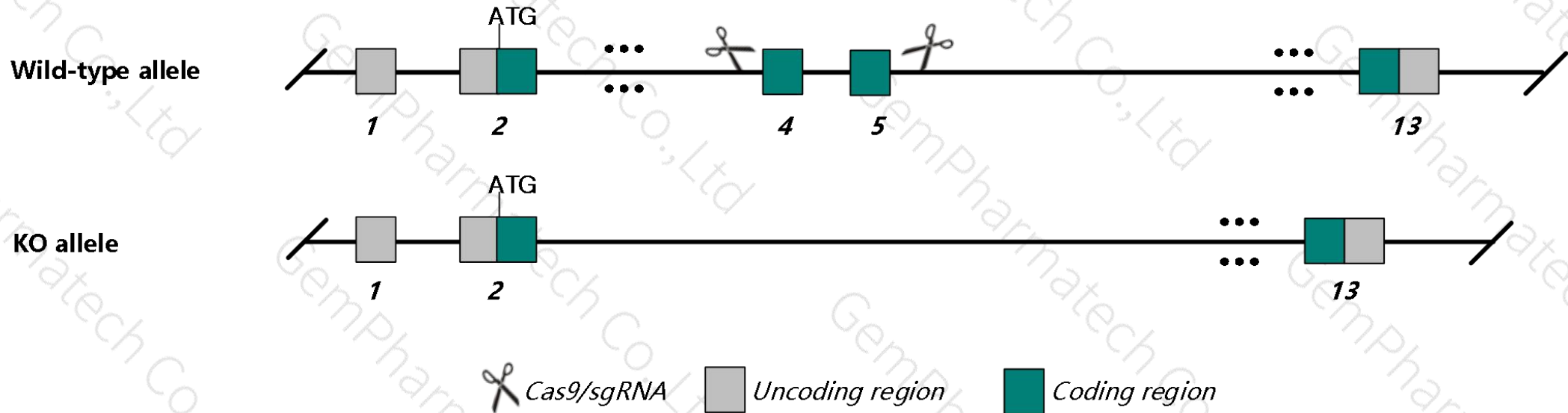|	
Project Name	*Xrcc6*
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Xrcc6* gene. The schematic diagram is as follows:

Technical routes

➤ The *Xrcc6* gene has 12 transcripts. According to the structure of *Xrcc6* gene, exon4-exon5 of *Xrcc6-201* (ENSMUST00000069530.12) transcript is recommended as the knockout region.The region contains 394bp coding sequence. Knock out the region will result in disruption of protein function.

➤ In this project we use CRISPR/Cas9 technology to modify *Xrcc6* gene. The brief process is as follows:CRISPR/Cas9 system tra 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.

Notice

➢ According to the existing MGI data,Mice homozygous for a knock-out allele exhibit neuron apoptosis, decreased body size, abnormal B and T cell morphology, increased incidence of tumorigenesis, and increased cellular sensitivity to irradiation.

➢ The *Xrcc6* 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 gene knockout on gene transcription, RNA splicing and protein translation cannot be predicted at existing technological level.

Gene information （NCBI）

Xrcc6 X-ray repair complementing defective repair in Chinese hamster cells 6 [Mus musculus (house mouse)]

Gene ID: 14375, updated on 7-Apr-2019

▲Summary

|	
Official Symbol	Xrcc6 provided by MGI
Official Full Name	X-ray repair complementing defective repair in Chinese hamster cells 6 provided by MGI
Primary source	MGI:MGI:95606
See related	Ensembl:ENSMUSG00000022471
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	70kDa, G22p1, Ku70
Expression	Ubiquitous expression in thymus adult (RPKM 14.8), liver E14 (RPKM 4.4) and 23 other tissuesSee more
Orthologs	human all

Transcript information（Ensembl）

The gene has 12 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Xrcc6-202	ENSMUST00000100399.10	3296	608aa	Protein coding	CCDS37153	A0A0R4J187	TSL:1 GENCODE basic APPRIS P1
Xrcc6-201	ENSMUST00000069530.12	2114	608aa	Protein coding	CCDS37153	A0A0R4J187	TSL:1 GENCODE basic APPRIS P1
Xrcc6-212	ENSMUST00000230729.1	1062	263aa	Protein coding	-	A0A2R8VHZ9	GENCODE basic
Xrcc6-204	ENSMUST00000164779.1	809	97aa	Protein coding	-	E9PZD4	CDS 3' incomplete TSL:3
Xrcc6-207	ENSMUST00000165777.7	797	106aa	Protein coding	-	E9Q163	CDS 3' incomplete TSL:5
Xrcc6-209	ENSMUST00000168581.7	471	27aa	Protein coding	-	E9Q4A4	CDS 3' incomplete TSL:5
Xrcc6-211	ENSMUST00000170907.1	802	No protein	Retained intron	-	-	TSL:2
Xrcc6-208	ENSMUST00000166311.1	686	No protein	Retained intron	-	-	TSL:3
Xrcc6-203	ENSMUST00000164775.1	529	No protein	Retained intron	-	-	TSL:3
Xrcc6-206	ENSMUST00000164975.1	425	No protein	Retained intron	-	-	TSL:3
Xrcc6-210	ENSMUST00000170630.1	677	No protein	lncRNA	-	-	TSL:5
Xrcc6-205	ENSMUST00000164920.7	387	No protein	lncRNA	-	-	TSL:3

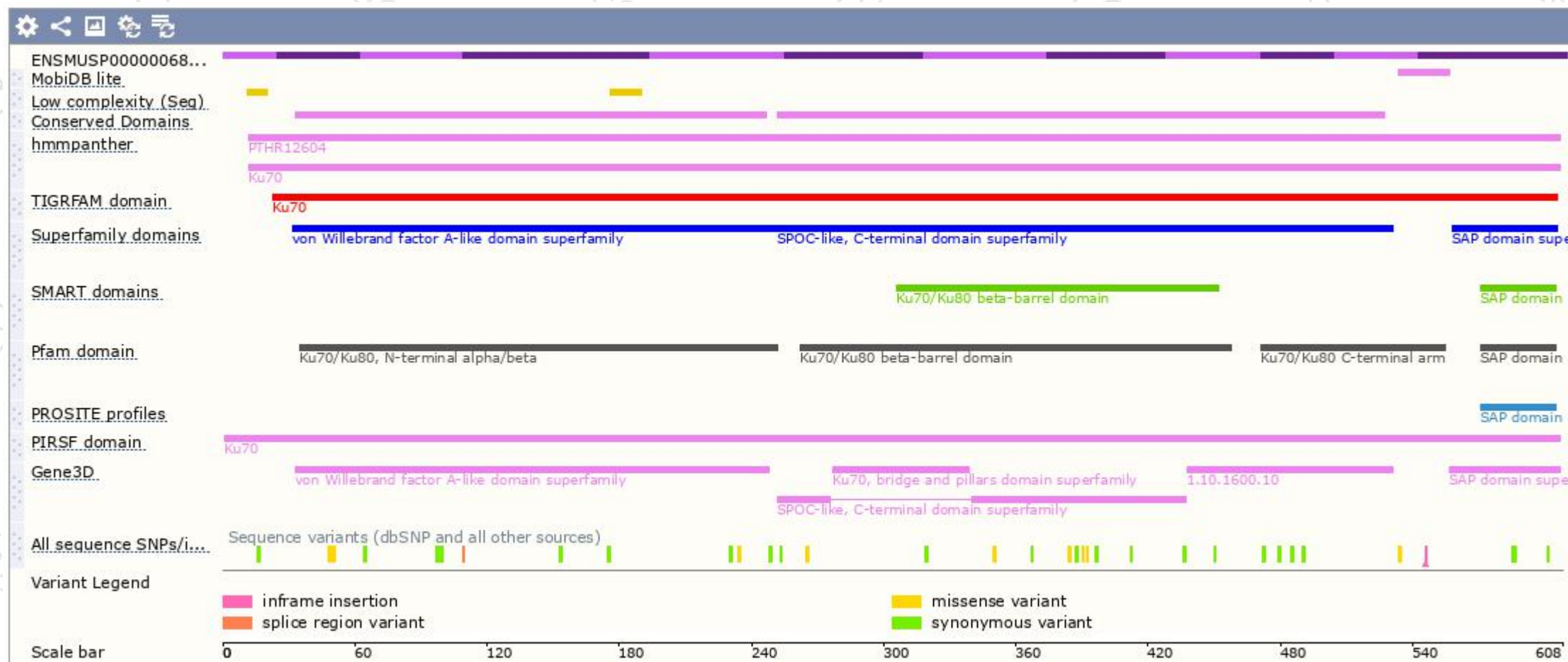The strategy is based on the design of *Xrcc6-201* transcript,The transcription is shown below
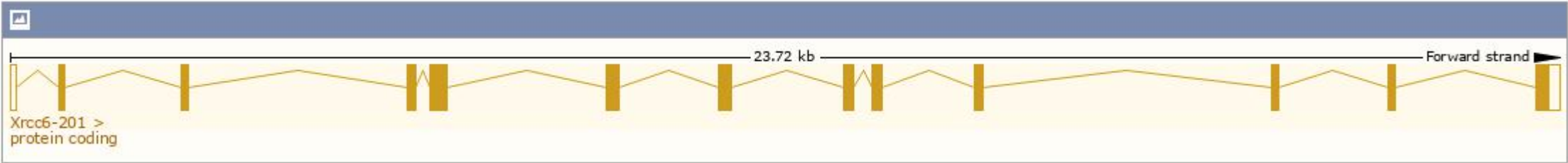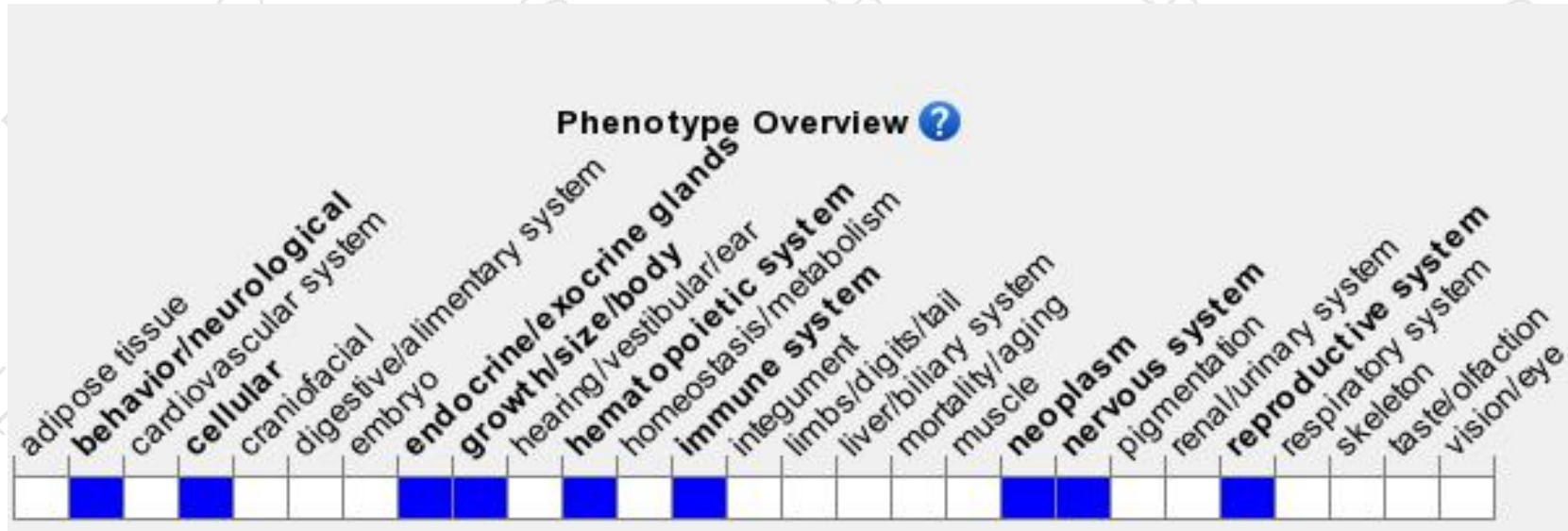
Genomic location distribution
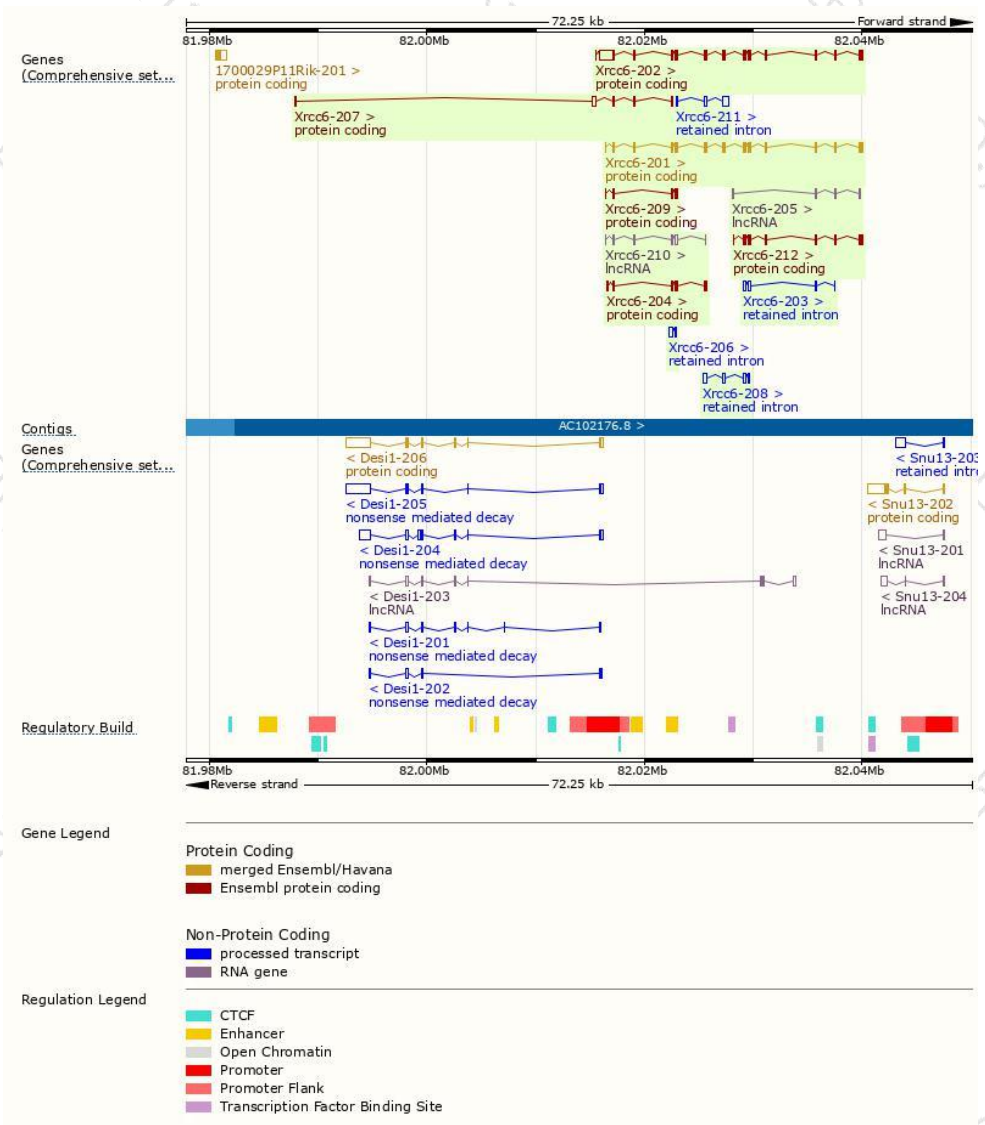
Protein domain

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 a knock-out allele exhibit neuron apoptosis, decreased body size, abnormal B and T cell morphology, increased incidence of tumorigenesis, and increased cellular sensitivity to irradiation.

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