Rad50 Cas9-KO Strategy

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Project Overview

Project Name	*Rad50*
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

This model will use CRISPR/Cas9 technology to edit the *Rad50* gene. The schematic diagram is as follows:

➢ The *Rad50* gene has 5 transcripts. According to the structure of *Rad50* gene, exon2-exon3 of *Rad50-201* (ENSMUST00000020649.13) transcript is recommended as the knockout region.The region contains 236bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Rad50* gene. The brief process is as follows: CRISPR/Cas9 system

➤ According to the existing MGI data,Homozygotes for a targeted hypomorphic mutation exhibit growth defects, predisposition toward cancer, progressive loss of hematopoietic and spermatogenic stem cells, and lethality due to bone marrow depletion. A null mutation results in embryonic death.

➤ The distance between exon3 of *Rad50* and *Gm22275* is about 0.6kb, and the knockout of *Rad50* may affect the functional of *Gm22275* .

➤ The *Rad50* gene is located on the Chr11. 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.

Rad50 RAD50 double strand break repair protein [*Mus musculus* (house mouse)]

Gene ID: 19360, updated on 12-Aug-2019

▲ Summary

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Official Symbol	Rad50 provided by MGI
Official Full Name	RAD50 double strand break repair protein provided by MGI
Primary source	MGI:MGI:109292
See related	Ensembl:ENSMUSG00000020380
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	Mrell; Rad50l
Expression	Ubiquitous expression in bladder adult (RPKM 4.4), CNS E11.5 (RPKM 4.2) and 28 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		
Rad50-201	ENSMUST00000020649.13	5153	1312aa	Protein coding	CCDS24684	Q5SV02	TSL:1	GENCODE basic	APPRIS P1
Rad50-202	ENSMUST00000124352.1	2211	657aa	Protein coding	-	A8Y5I3	CDS 3' incomplete	TSL:1	
Rad50-204	ENSMUST00000128483.7	3085	551aa	Nonsense mediated decay	-	E9PUJ2	TSL:1		
Rad50-205	ENSMUST00000152598.1	693	No protein	lncRNA	-	-	TSL:2		
Rad50-203	ENSMUST00000126121.1	404	No protein	lncRNA	-	-	TSL:2		

The strategy is based on the design of *Rad50-201* transcript,The transcription is shown below

< Rad50-201
protein coding

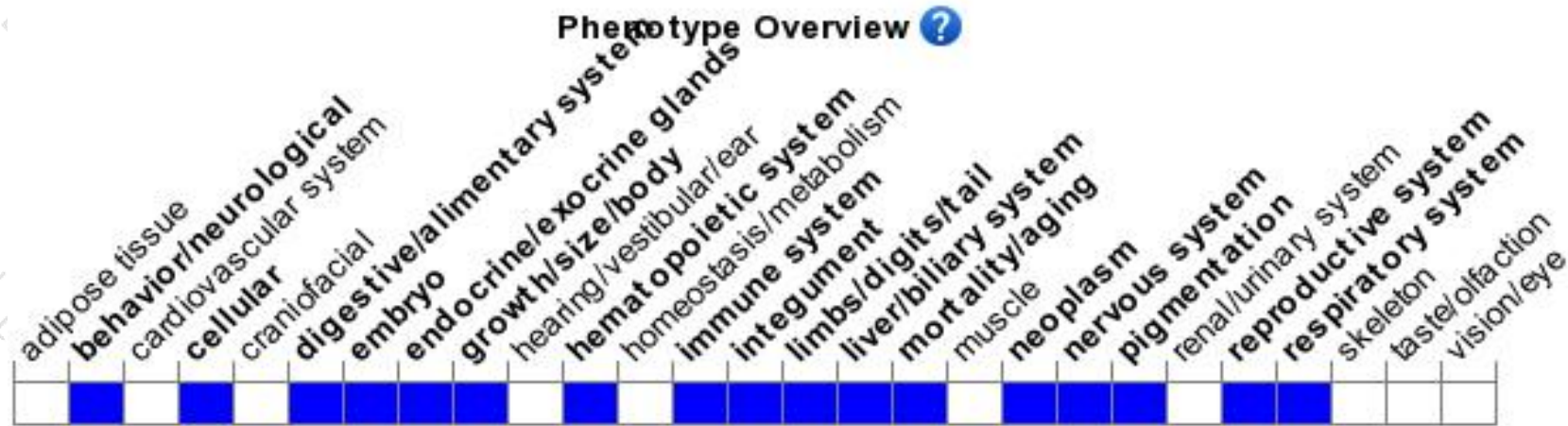◄ Reverse strand ———————————————— 57.80 kb ————————————————►
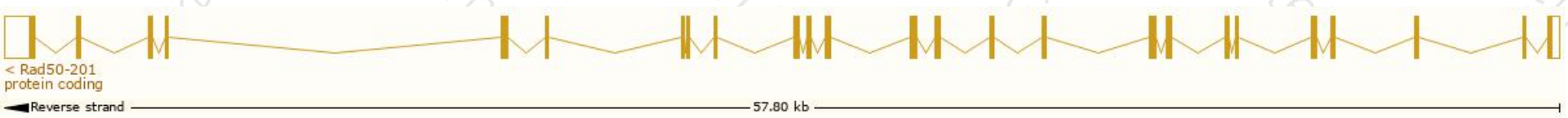
Genomic location distribution
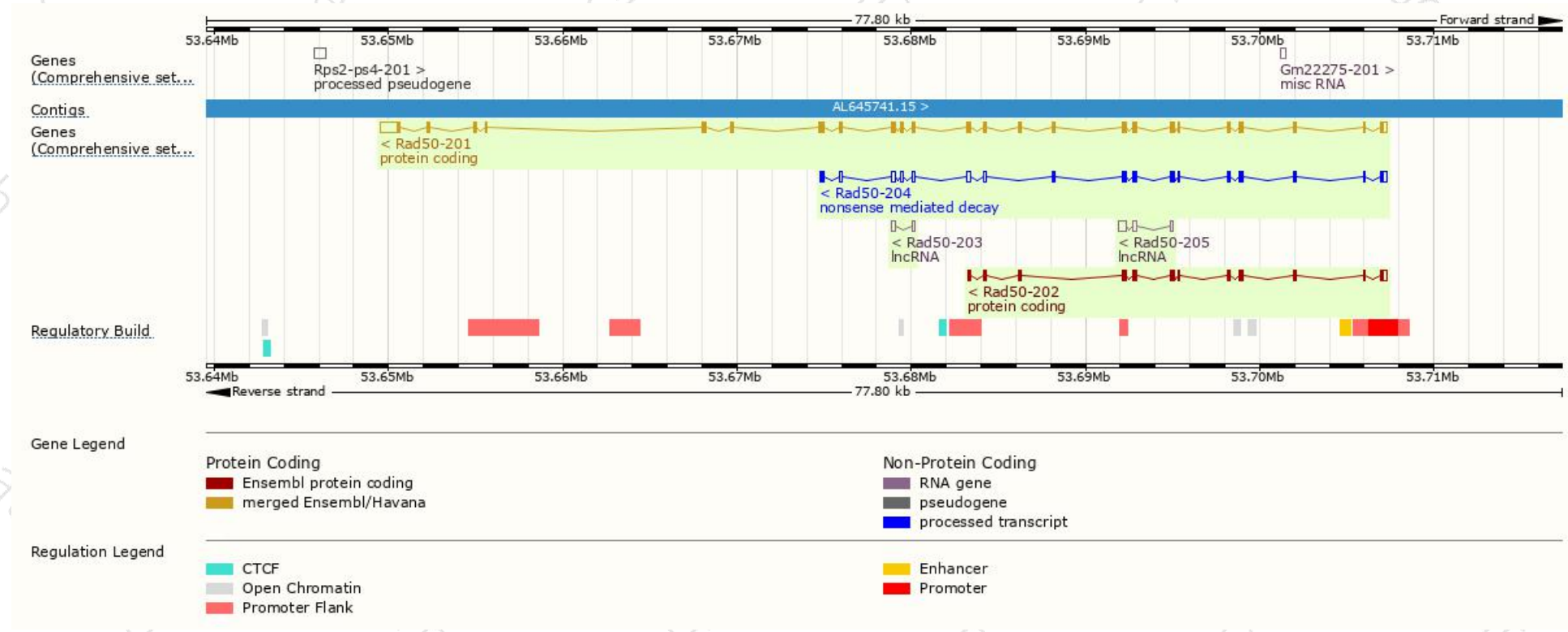
Protein domain

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,Homozygotes for a targeted hypomorphic mutation exhibit growth defects, predisposition toward cancer, progressive loss of hematopoietic and spermatogenic stem cells, and lethality due to bone marrow depletion. A null mutation results in embryonic death.

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