

# *Lrrk2* Cas9-KO Strategy

**Designer:**

**Daohua Xu**

**Reviewer:**

**Huimin Su**

**Design Date:**

**2019-11-22**

# Project Overview

**Project Name**

*Lrrk2*

**Project type**

**Cas9-KO**

**Strain background**

**C57BL/6JGpt**

# Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Lrrk2* gene. The schematic diagram is as follows:



- The *Lrrk2* gene has 6 transcripts. According to the structure of *Lrrk2* gene, exon3 of *Lrrk2-201* (ENSMUST00000060642.6) transcript is recommended as the knockout region. The region contains 110bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Lrrk2* gene. The brief process is as follows: CRISPR/Cas9 system

- According to the existing MGI data, Mice homozygous for a knock-in allele exhibit impaired response to dopamine, amphetamine, and quinpirole. Mice homozygous for one knock-out allele exhibit increased neurite growth. Mice homozygous for different knock-out alleles exhibit alopecia due to excessive grooming or kidney atrophy.
- The *Lrrk2* 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)

## Lrrk2 leucine-rich repeat kinase 2 [Mus musculus (house mouse)]

Gene ID: 66725, updated on 9-Apr-2019

### Summary



<b>Official Symbol</b>	Lrrk2 provided by <a href="#">MGI</a>
<b>Official Full Name</b>	leucine-rich repeat kinase 2 provided by <a href="#">MGI</a>
<b>Primary source</b>	<a href="#">MGI:MGI:1913975</a>
<b>See related</b>	<a href="#">Ensembl:ENSMUSG00000036273</a>
<b>Gene type</b>	protein coding
<b>RefSeq status</b>	VALIDATED
<b>Organism</b>	<a href="#">Mus musculus</a>
<b>Lineage</b>	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
<b>Also known as</b>	4921513O20Rik, 9330188B09Rik, AW561911, D630001M17Rik, Gm927, cl-46
<b>Expression</b>	Broad expression in kidney adult (RPKM 2.7), lung adult (RPKM 2.3) and 24 other tissues <a href="#">See more</a>
<b>Orthologs</b>	<a href="#">human</a> <a href="#">all</a>

# Transcript information (Ensembl)

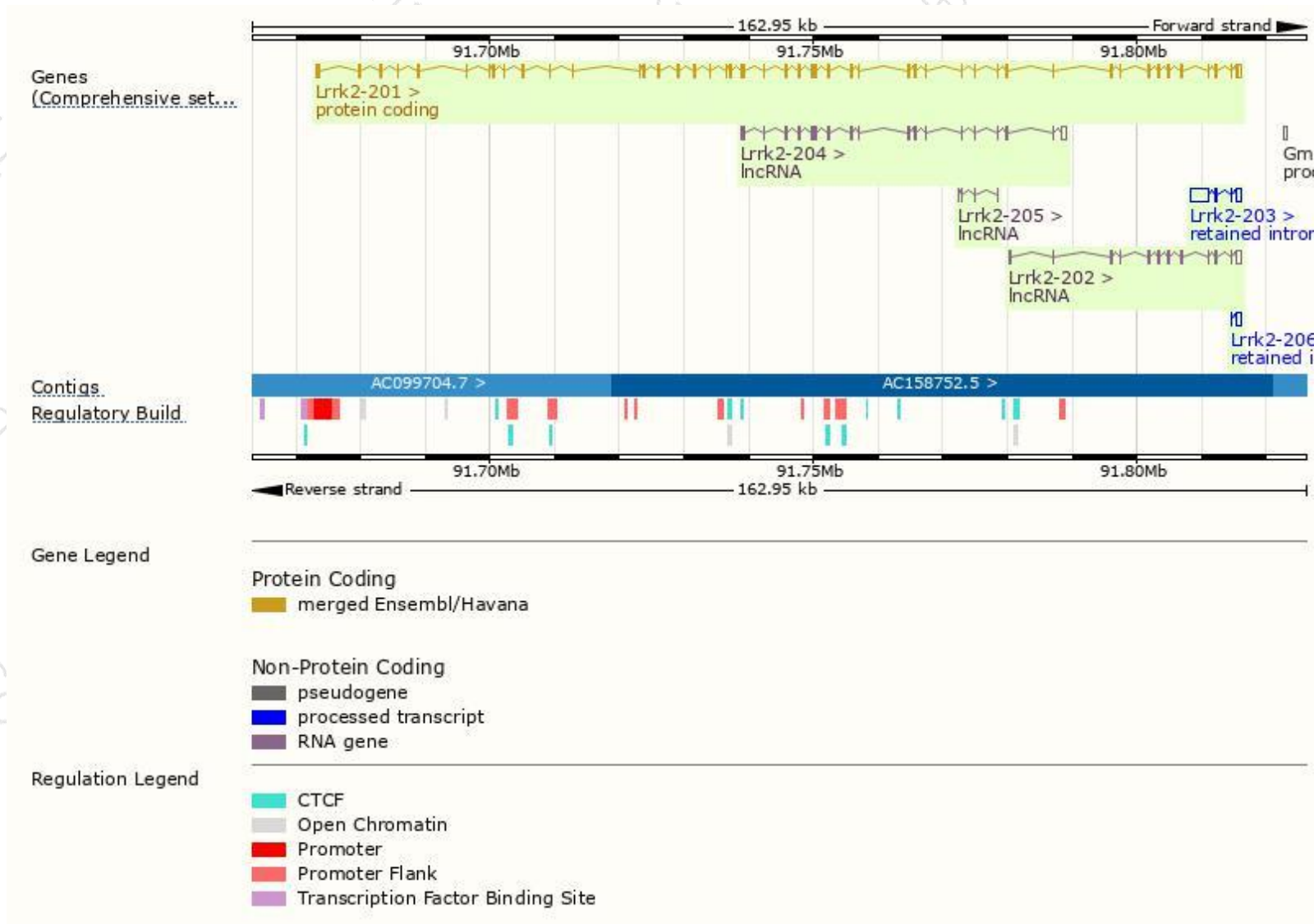
The gene has 6 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Lrrk2-201	<a href="#">ENSMUST00000060642.6</a>	8275	<a href="#">2527aa</a>	Protein coding	<a href="#">CCDS37180</a>	<a href="#">Q5S006</a>	TSL:1 GENCODE basic APPRIS P1
Lrrk2-203	<a href="#">ENSMUST00000137657.1</a>	3801	No protein	Retained intron	-	-	TSL:1
Lrrk2-206	<a href="#">ENSMUST00000172797.1</a>	812	No protein	Retained intron	-	-	TSL:1
Lrrk2-204	<a href="#">ENSMUST00000140734.7</a>	3452	No protein	lncRNA	-	-	TSL:1
Lrrk2-202	<a href="#">ENSMUST00000133743.7</a>	2203	No protein	lncRNA	-	-	TSL:1
Lrrk2-205	<a href="#">ENSMUST00000156900.1</a>	438	No protein	lncRNA	-	-	TSL:3

The strategy is based on the design of *Lrrk2-201* transcript,The transcription is shown below

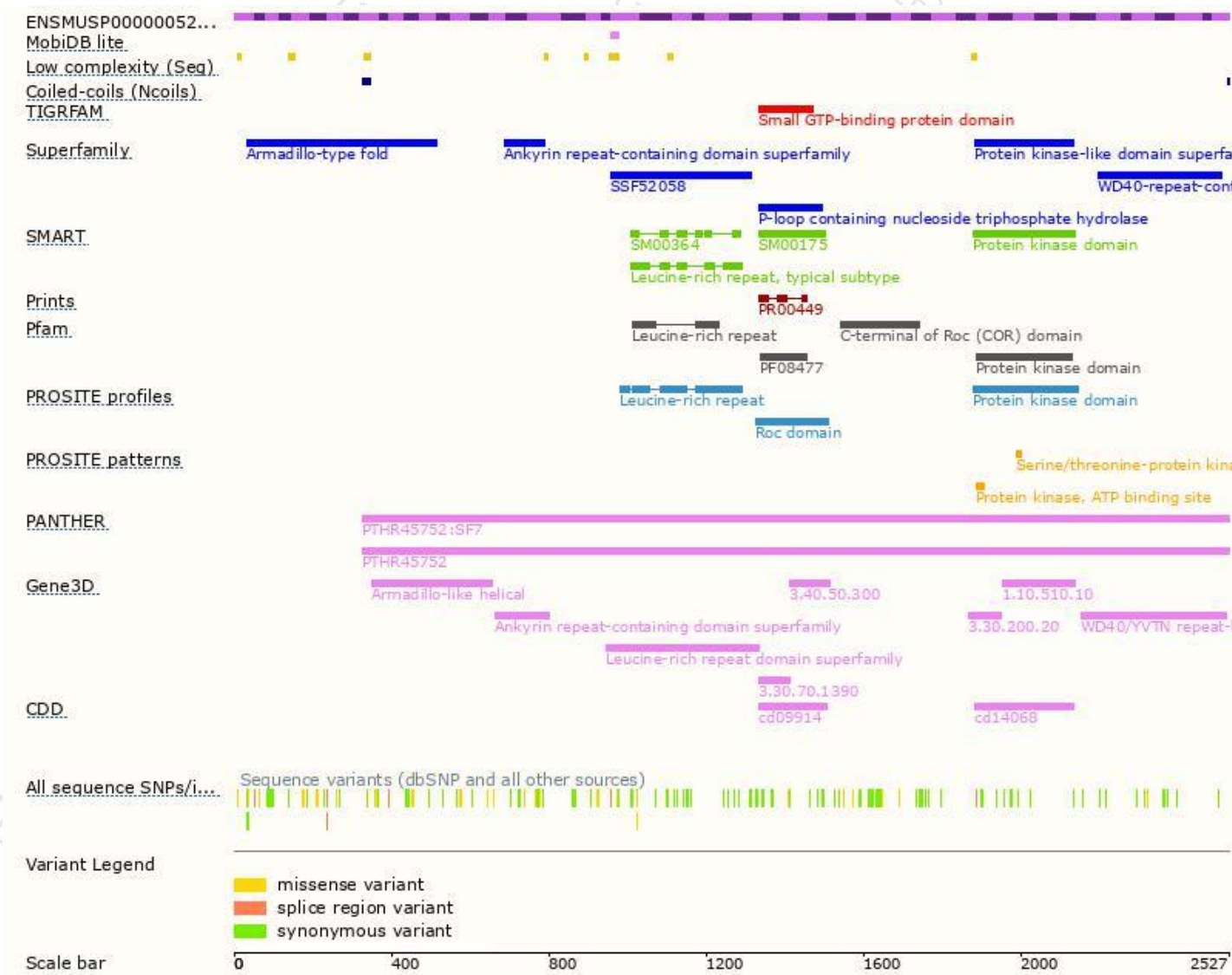


# Genomic location distribution

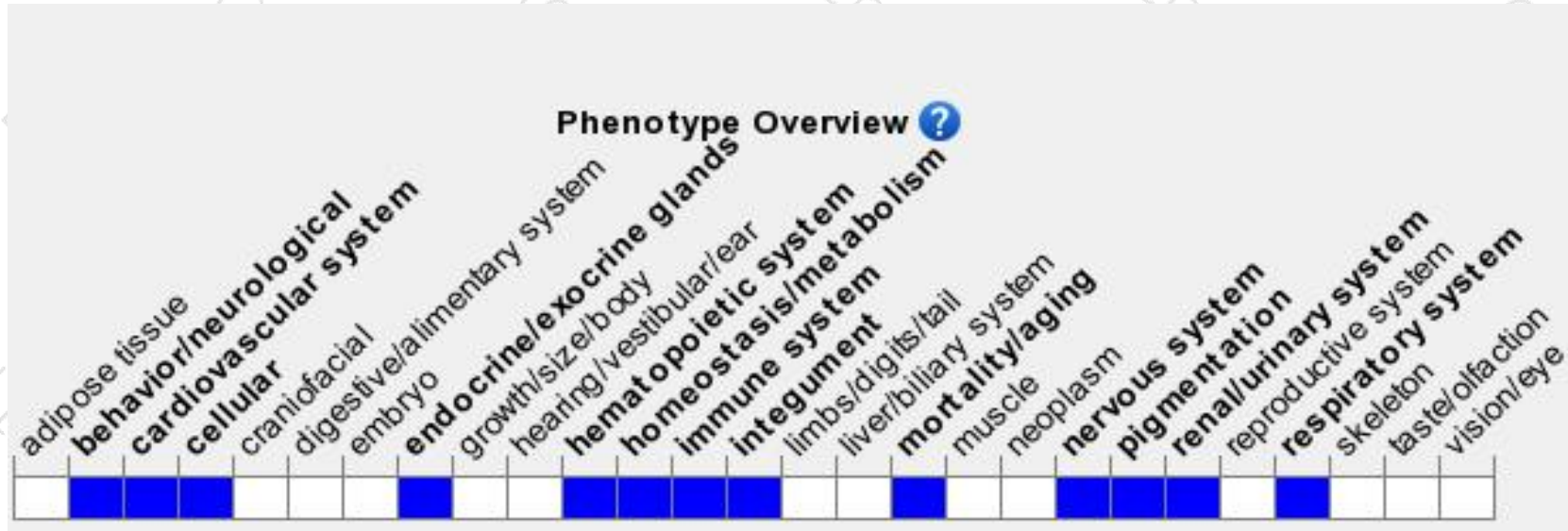




# Protein domain



# 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-in allele exhibit impaired response to dopamine, amphetamine, and quinpirole. Mice homozygous for one knock-out allele exhibit increased neurite growth. Mice homozygous for different knock-out alleles exhibit alopecia due to excessive grooming or kidney atrophy.

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

Tel: 400-9660890

