Park7 Cas9-CKO Strategy

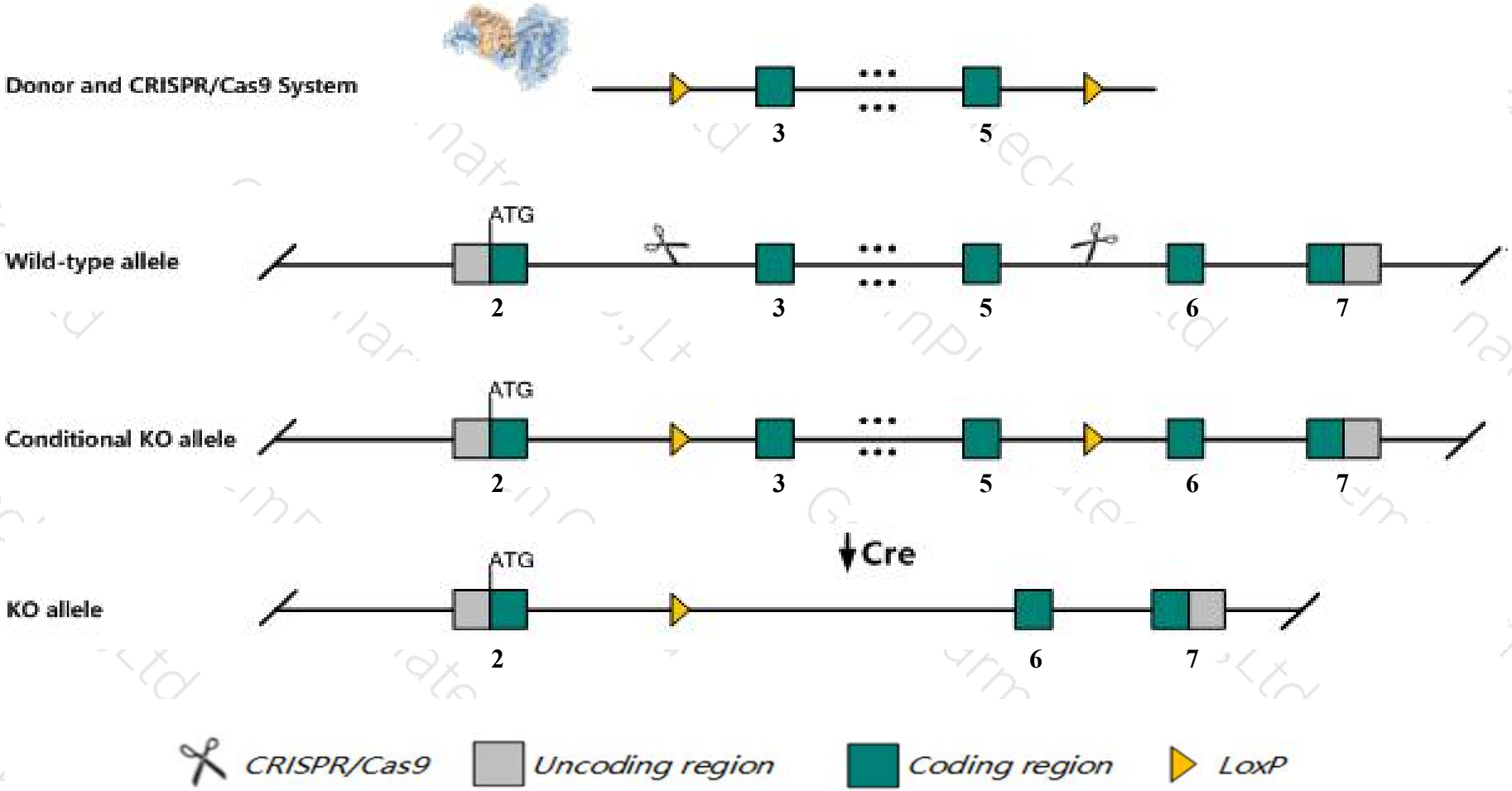
Designer:Qiong Zhou
Design Date:2019-8-9

Project Overview

Project Name	***Park7***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Park7* gene. The schematic diagram is as follows:



Technical routes

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- The *Park7* gene has 10 transcripts. According to the structure of *Park7* gene, exon3-exon5 of *Park7-201* (ENSMUST00000030805.13) transcript is recommended as the knockout region.The region contains 232bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Park7* gene. The brief process is as follows:gRNA was transcribed in vitro, donor was constructed.Cas9, gRNA 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,Homozygous null mice exhibit reduced evoked dopamine overflow in the striatum, resulting primarily from increased dopamine uptake. Mice show hyopactivity, absent long-term depression in medium spiny neurons and decreased sensitivity of nigral neurons to dopamine.
- Transcript *Park7*-207 may not be affected .
- The floxed region is near to the N-terminal of *Tnfrsf9* gene,this strategy may influence the regulatory function of the N-terminal of *Tnfrsf9* gene.
- The *Park7* 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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Park7 Parkinson disease (autosomal recessive, early onset) 7 [Mus musculus (house mouse)]

Gene ID: 57320, updated on 9-Apr-2019

Summary

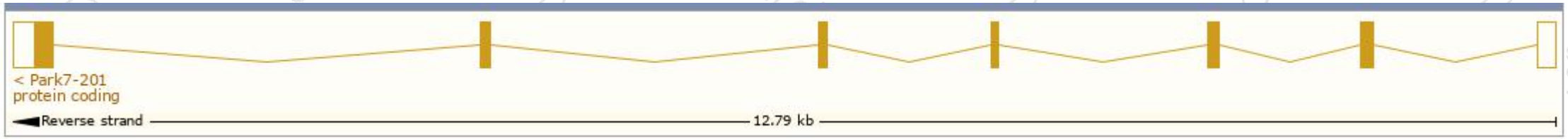
Official Symbol	Park7 provided by MGI
Official Full Name	Parkinson disease (autosomal recessive, early onset) 7 provided byMGI
Primary source	MGI:MGI:2135637
See related	Ensembl:ENSMUSG00000028964
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	DJ-1, Dj1
Expression	Ubiquitous expression in kidney adult (RPKM 117.4), CNS E11.5 (RPKM 109.9) and 28 other tissuesSee more
Orthologs	human all

Transcript information（Ensembl）

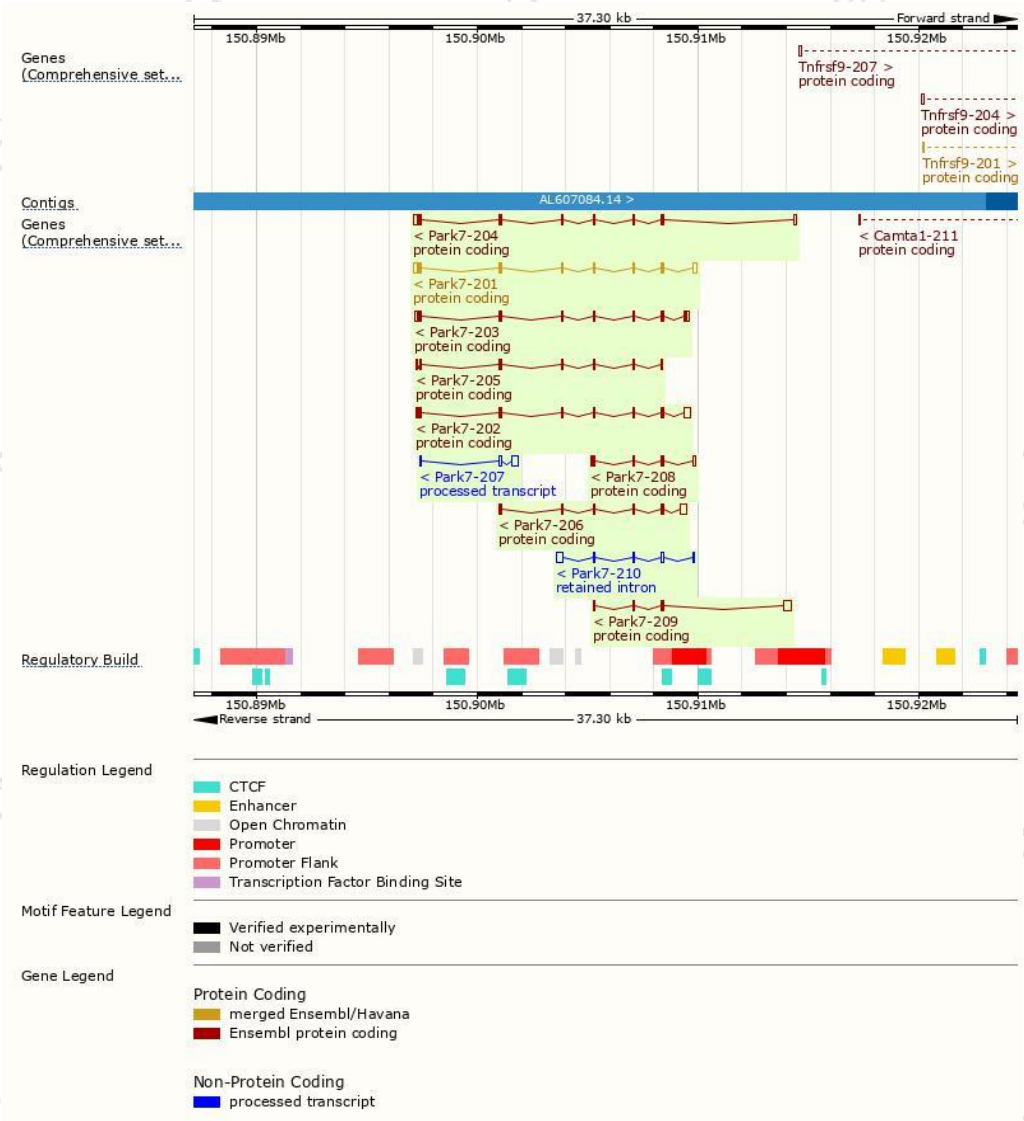
The gene has 10 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Park7-203	ENSMUST00000105674.7	937	189aa	Protein coding	CCDS18975	Q99LX0	TSL:5 GENCODE basic APPRIS P1
Park7-202	ENSMUST00000105673.7	919	189aa	Protein coding	CCDS18975	Q99LX0	TSL:5 GENCODE basic APPRIS P1
Park7-201	ENSMUST00000030805.13	908	189aa	Protein coding	CCDS18975	Q99LX0	TSL:1 GENCODE basic APPRIS P1
Park7-204	ENSMUST00000105675.7	882	189aa	Protein coding	CCDS18975	Q99LX0	TSL:5 GENCODE basic APPRIS P1
Park7-206	ENSMUST00000128075.7	715	135aa	Protein coding	-	A2A815	CDS 3' incomplete TSL:5
Park7-209	ENSMUST00000146184.2	584	84aa	Protein coding	-	A2A817	CDS 3' incomplete TSL:5
Park7-205	ENSMUST00000105676.7	582	175aa	Protein coding	-	A2A813	TSL:5 GENCODE basic
Park7-208	ENSMUST00000134751.7	478	125aa	Protein coding	-	A2A816	CDS 3' incomplete TSL:2
Park7-207	ENSMUST00000132265.1	472	No protein	Processed transcript	-	-	TSL:3
Park7-210	ENSMUST00000148626.1	640	No protein	Retained intron	-	-	TSL:2

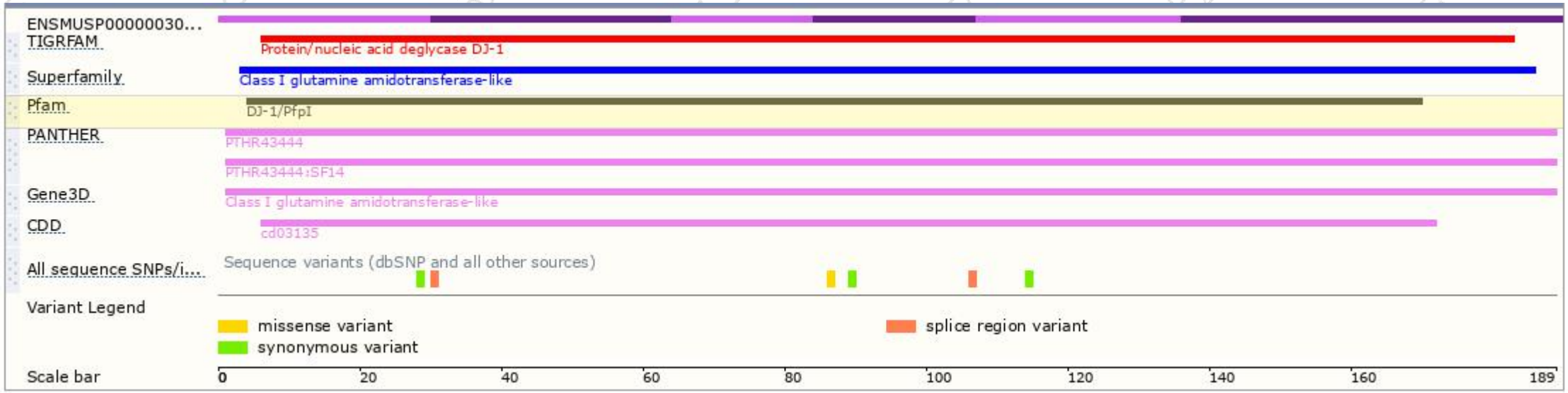
The strategy is based on the design of *Park7-201* transcript,The transcription is shown below



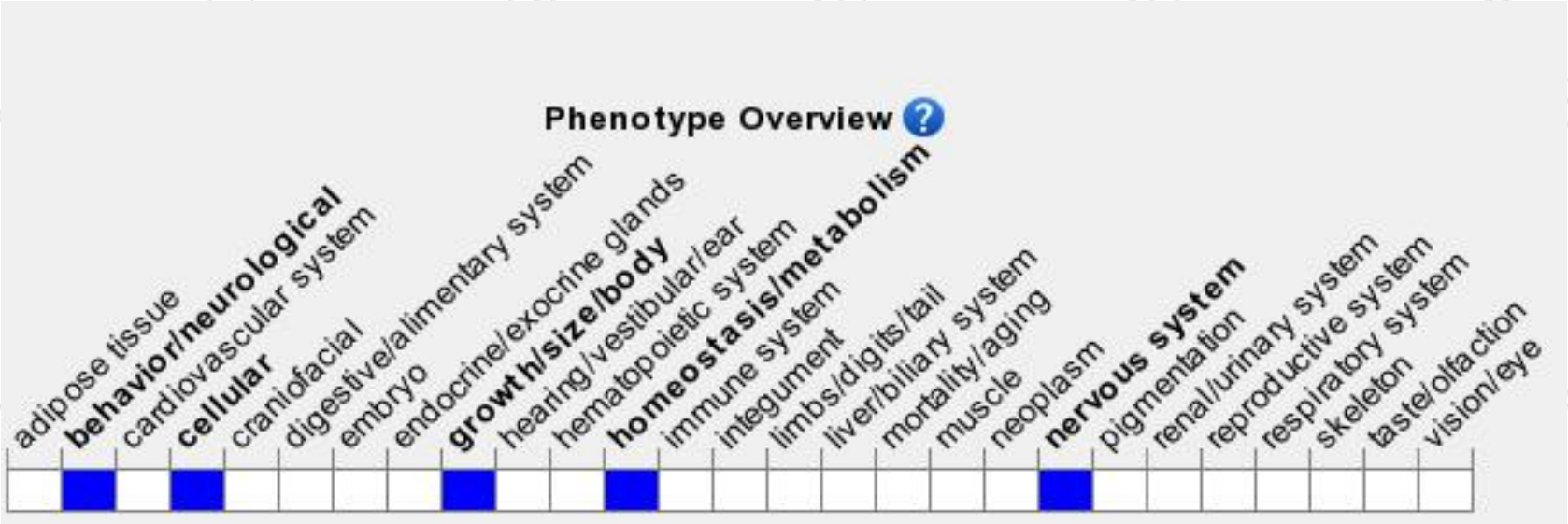
Genomic location distribution



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.

Tel: 400-9660890

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GemPharmatech Co.,Ltd