

# ***Grk6* Cas9-CKO Strategy**

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# Project Overview

**Project Name**

***Grk6***

**Project type**

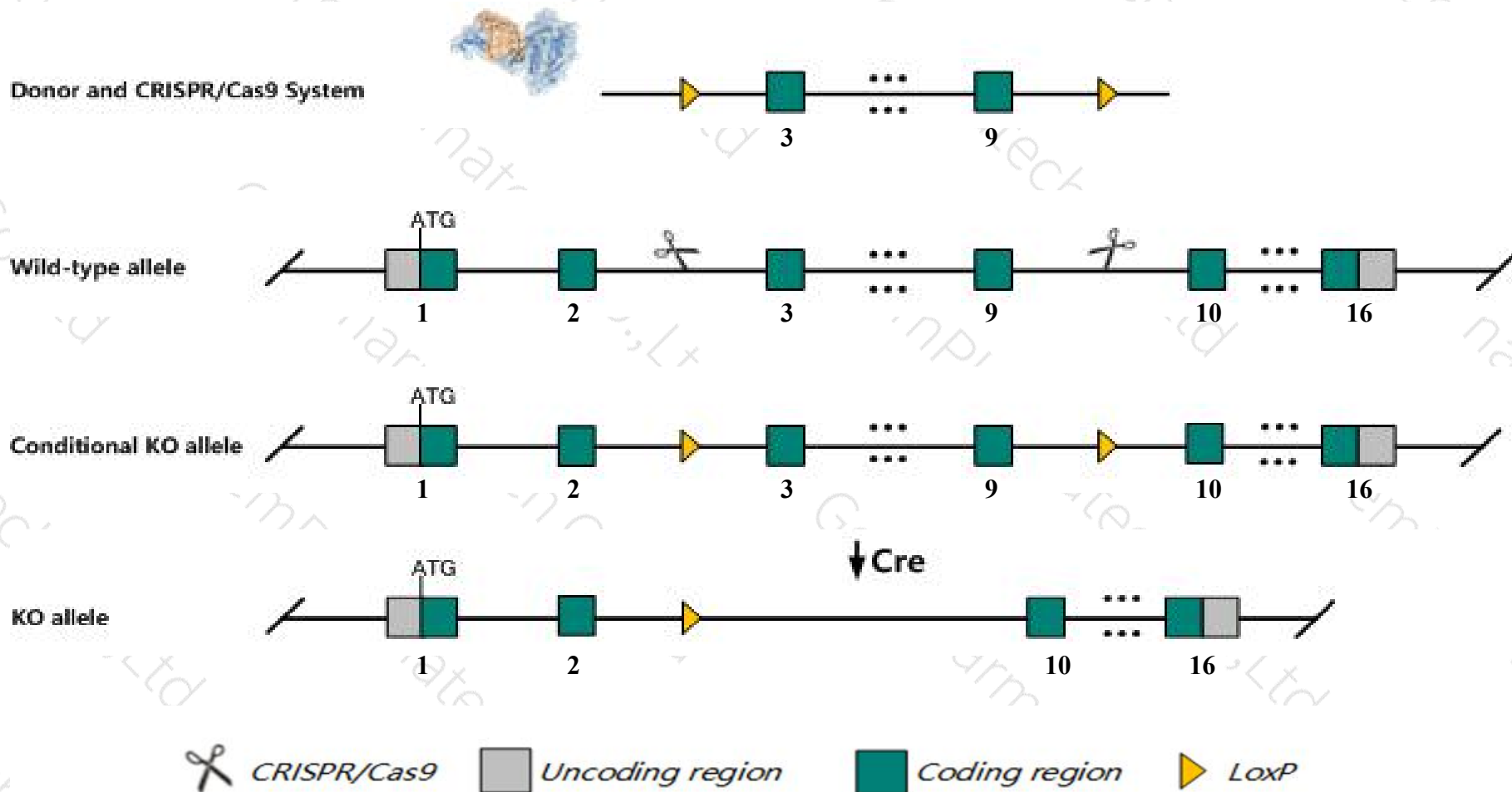
**Cas9-CKO**

**Strain background**

**C57BL/6JGpt**

# Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Grk6* gene. The schematic diagram is as follows:



- The *Grk6* gene has 7 transcripts. According to the structure of *Grk6* gene, exon3-exon9 of *Grk6-201* (ENSMUST00000001115.15) transcript is recommended as the knockout region. The region contains 781bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Grk6* gene. The brief process is as follows: CRISPR/Cas9 system 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.

- According to the existing MGI data, Whereas, homozygous mutant mice are viable and show no gross anatomical or behavioral abnormalities under normal physiological conditions, they exhibit locomotor supersensitivity to psychostimulants including cocaine and amphetamine.
- The floxed region is near to the N-terminal of *Mir6943* gene, this strategy may influence the regulatory function of the N-terminal of *Mir6943* gene.
- Transcript *Grk6*-204 may be not affected.
- The *Grk6* gene is located on the Chr13. 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)

## Grk6 G protein-coupled receptor kinase 6 [ *Mus musculus* (house mouse) ]

Gene ID: 26385, updated on 13-Dec-2019

### Summary

Official Symbol	Grk6 provided by <a href="#">MGI</a>
Official Full Name	G protein-coupled receptor kinase 6 provided by <a href="#">MGI</a>
Primary source	<a href="#">MGI:MGI:1347078</a>
See related	<a href="#">Ensembl:ENSMUSG00000074886</a>
Gene type	protein coding
RefSeq status	VALIDATED
Organism	<a href="#">Mus musculus</a>
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Gprk6
Expression	Ubiquitous expression in spleen adult (RPKM 77.5), thymus adult (RPKM 59.5) and 27 other tissues <a href="#">See more</a>
Orthologs	<a href="#">human</a> <a href="#">all</a>

### Genomic context

Location: 13 B1; 13 30.06 cM

See Grk6 in [Genome Data Viewer](#)

Exon count: 19

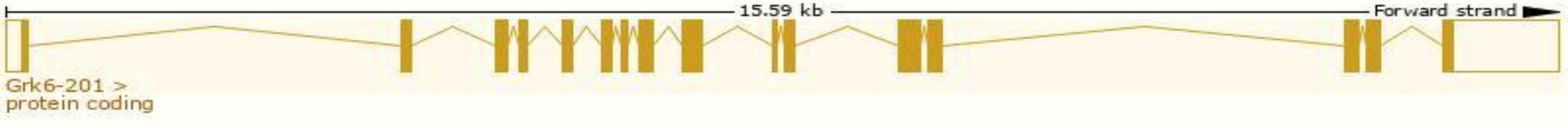
Annotation release	Status	Assembly	Chr	Location
<a href="#">108</a>	current	GRCm38.p6 ( <a href="#">GCF_000001635.26</a> )	13	NC_000079.6 (55445072..55460927)
Build 37.2	previous assembly	MGSCv37 ( <a href="#">GCF_000001635.18</a> )	13	NC_000079.5 (55546695..55562288)

# Transcript information (Ensembl)

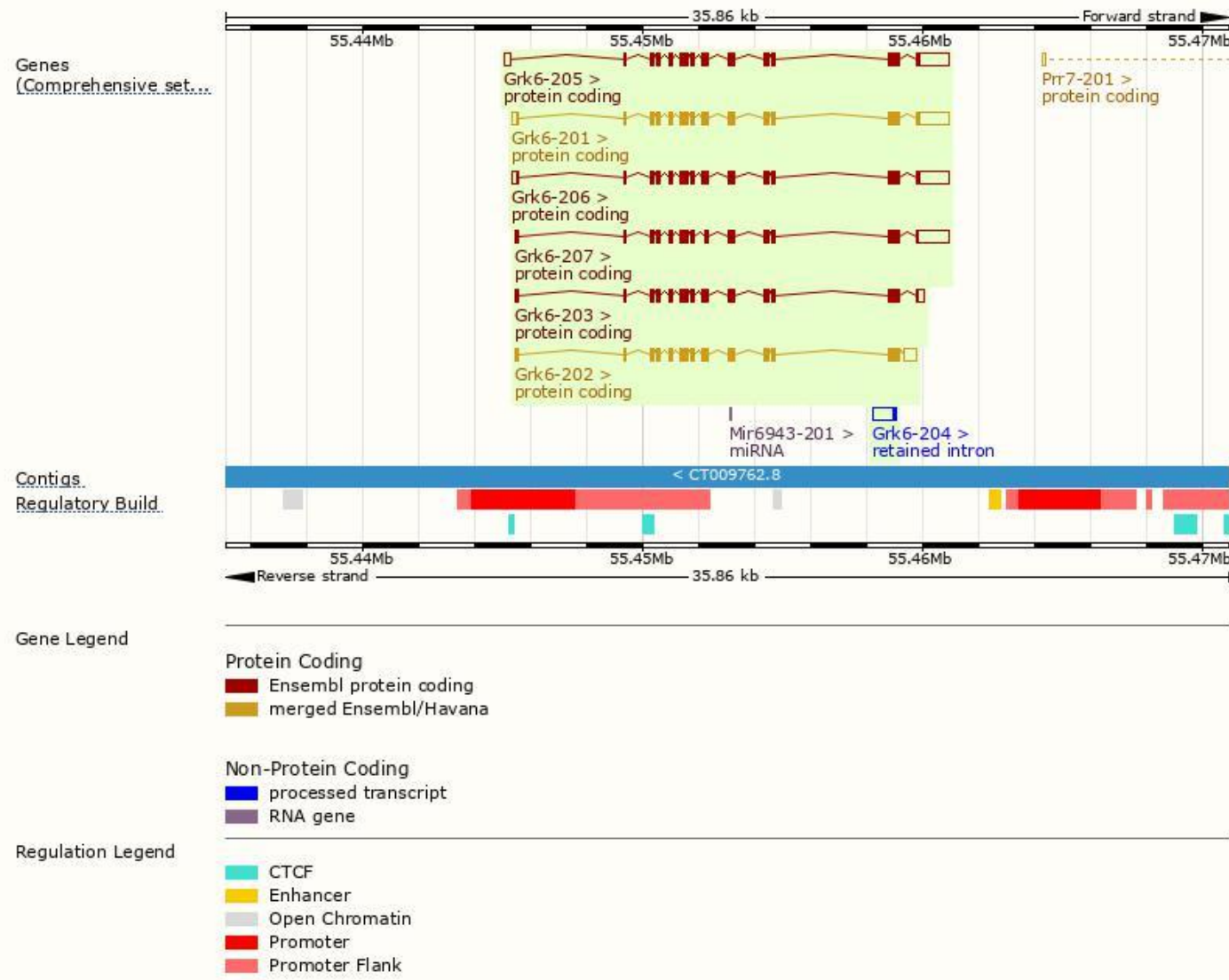
The gene has 7 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Grk6-201	<a href="#">ENSMUST00000001115.15</a>	2994	<a href="#">589aa</a>	Protein coding	<a href="#">CCDS49272</a>	<a href="#">Q70293</a>	TSL:1 GENCODE basic
Grk6-202	<a href="#">ENSMUST00000099482.4</a>	2169	<a href="#">560aa</a>	Protein coding	<a href="#">CCDS36676</a>	<a href="#">Q9EP84</a>	TSL:1 GENCODE basic APPRIS P2
Grk6-205	<a href="#">ENSMUST00000224653.1</a>	2976	<a href="#">557aa</a>	Protein coding	-	<a href="#">A0A286YDZ5</a>	GENCODE basic
Grk6-206	<a href="#">ENSMUST00000224995.1</a>	2971	<a href="#">584aa</a>	Protein coding	-	<a href="#">A0A286YDA5</a>	GENCODE basic
Grk6-207	<a href="#">ENSMUST00000225925.1</a>	2769	<a href="#">542aa</a>	Protein coding	-	<a href="#">A0A286YE10</a>	GENCODE basic
Grk6-203	<a href="#">ENSMUST00000224118.1</a>	1997	<a href="#">576aa</a>	Protein coding	-	<a href="#">Q70293</a>	GENCODE basic APPRIS ALT2
Grk6-204	<a href="#">ENSMUST00000224532.1</a>	753	No protein	Retained intron	-	-	

The strategy is based on the design of *Grk6-201* transcript,The transcription is shown below



# Genomic location distribution

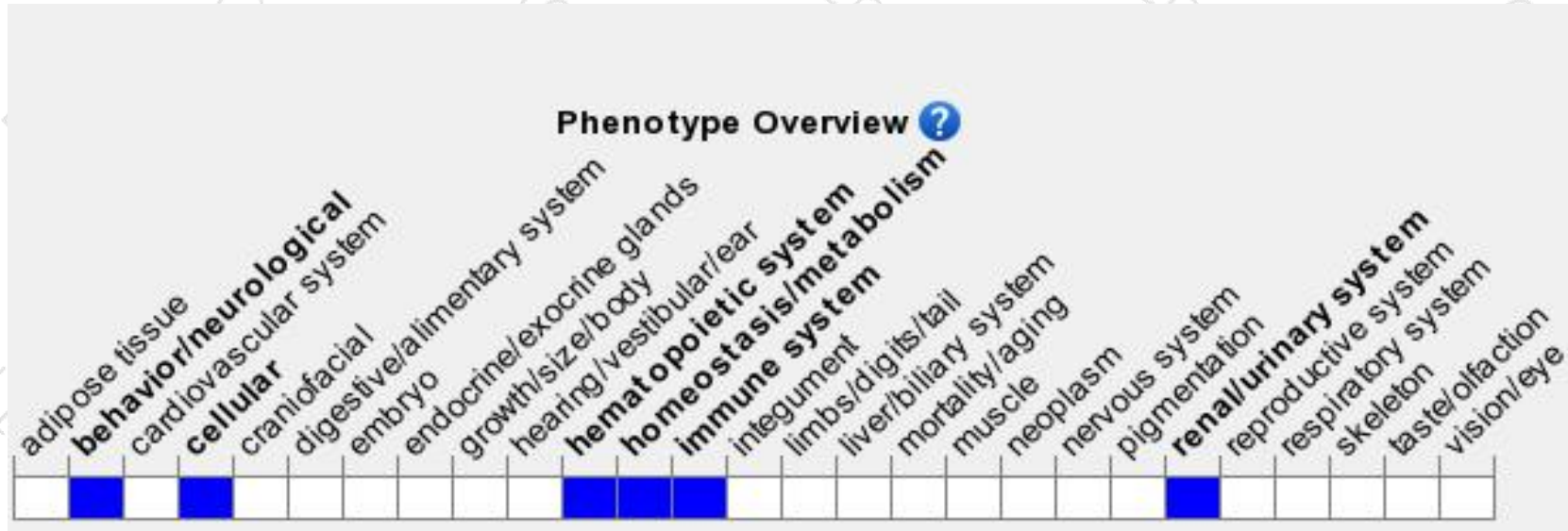




# Protein domain



# 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, Whereas, homozygous mutant mice are viable and show no gross anatomical or behavioral abnormalities under normal physiological conditions, they exhibit locomotor supersensitivity to psychostimulants including cocaine and amphetamine.

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

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