Dlg3 Cas9-KO Strategy

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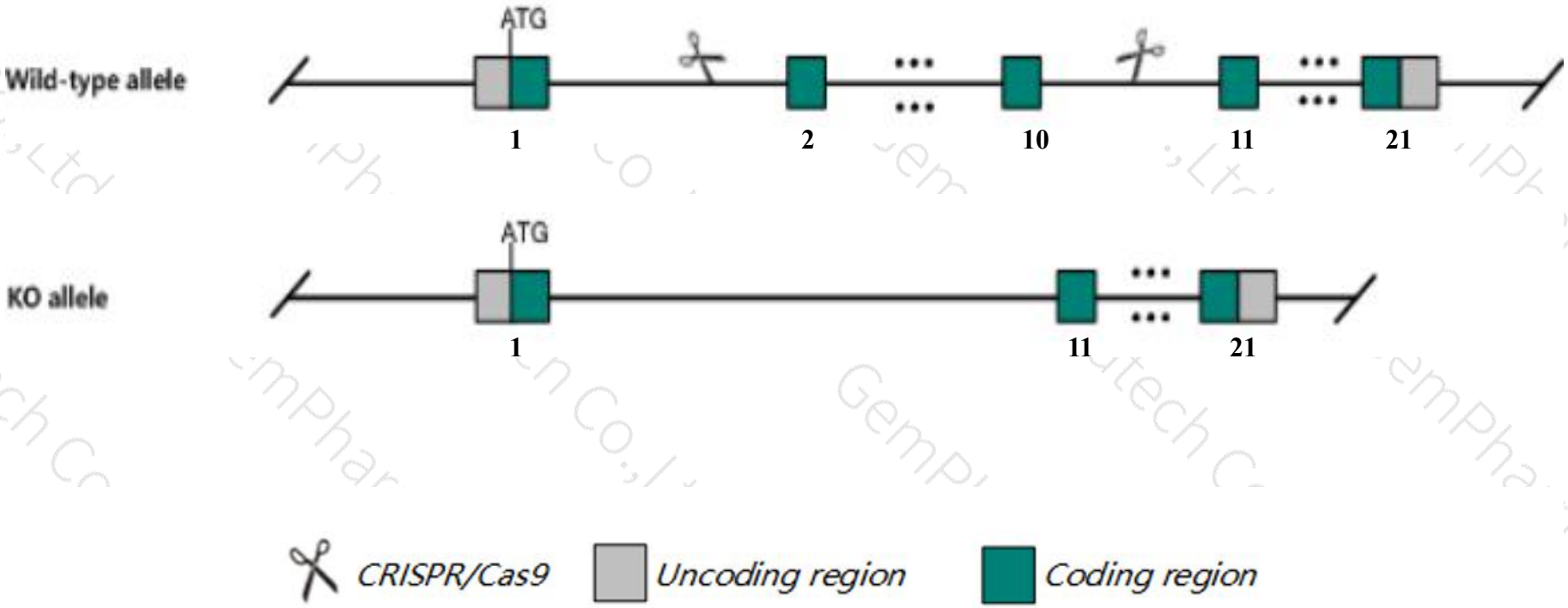
Design Date: 2020-7-20

Project Overview

Project Name	***Dlg3***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Dlg3* gene. The schematic diagram is as follows:



Technical routes

➢ The *Dlg3* gene has 8 transcripts. According to the structure of *Dlg3* gene, exon2-exon10 of *Dlg3-202*(ENSMUST00000087984.10) transcript is recommended as the knockout region.The region contains 1102bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Dlg3* gene. The brief process is as follows: CRISPR/Cas9 system 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.

Notice

➢ According to the existing MGI data,male mice hemizygous for a knock-out allele show alterations in spatial learning, locomotor activation, LTP, and spike-timing-dependent plasticity. A portion of chimeras hemizygous for a gene trapped allele display forebrain deletion, posterior truncation, and failure to initiate embryo turning.

➢ The *Dlg3* gene is located on the ChrX. 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）

Dlg3 discs large MAGUK scaffold protein 3 [Mus musculus (house mouse)]

Gene ID: 53310, updated on 20-Mar-2020

Summary

Official Symbol	Dlg3 provided by MGI
Official Full Name	discs large MAGUK scaffold protein 3 provided byMGI
Primary source	MGI:MGI:1888986
See related	Ensembl:ENSMUSG00000000881
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	Dlgh3, SAP102, mKIAA1232
Expression	Broad expression in frontal lobe adult (RPKM 16.8), cortex adult (RPKM 13.9) and 24 other tissuesSee more
Orthologs	human all

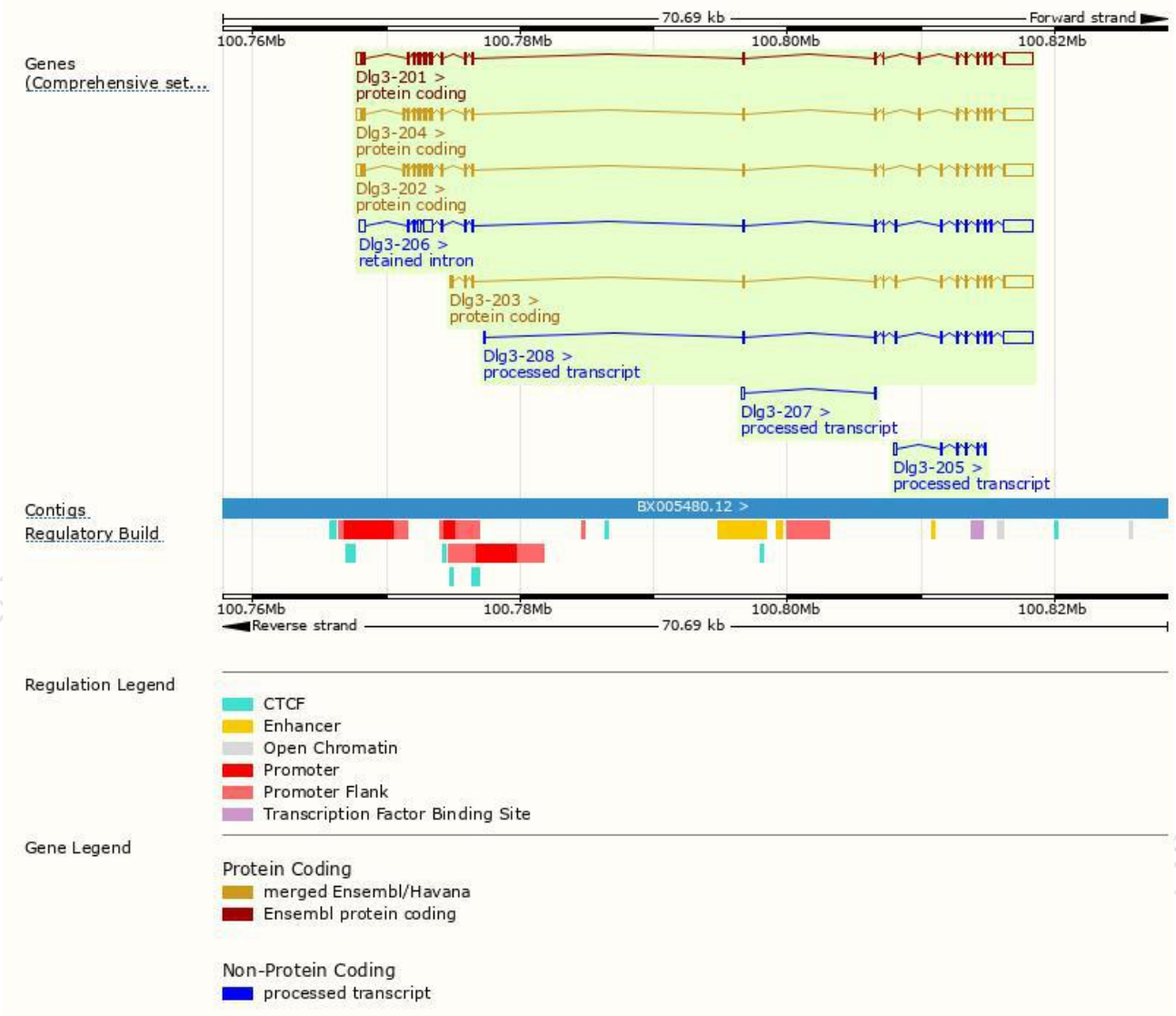
Transcript information（Ensembl）

The gene has 8 transcripts,all transcripts are shown below:

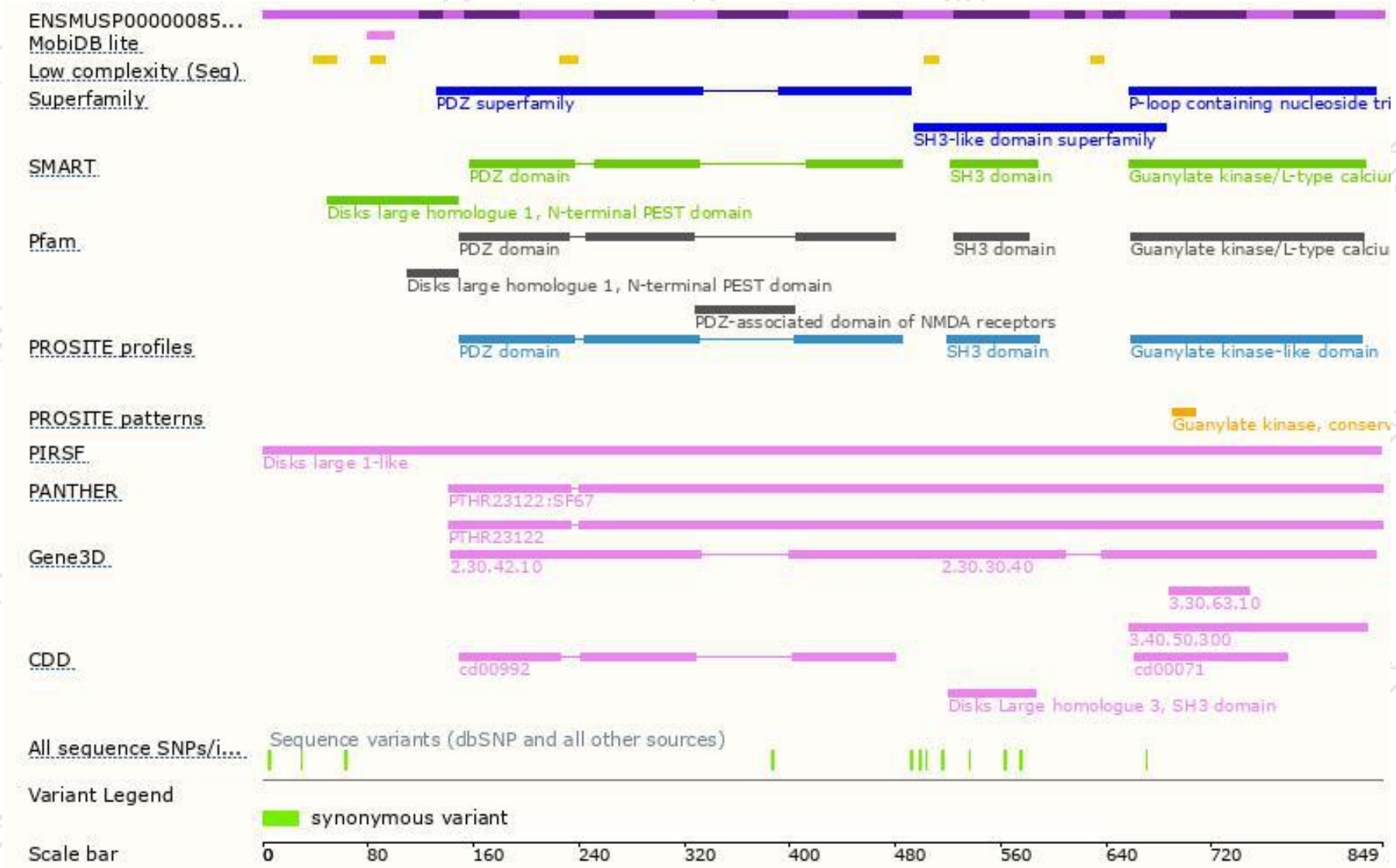
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Dlg3-202	ENSMUST00000087984.10	4956	849aa	Protein coding	CCDS30307	P70175	TSL:1 GENCODE basic
Dlg3-204	ENSMUST00000113736.8	4940	835aa	Protein coding	CCDS53148	A2BEE9	TSL:1 GENCODE basic
Dlg3-201	ENSMUST00000000901.12	4885	817aa	Protein coding	CCDS72413	Q52KF7	TSL:1 GENCODE basic APPRIS P1
Dlg3-203	ENSMUST00000113735.2	3692	512aa	Protein coding	CCDS53149	A2BEF2	TSL:1 GENCODE basic
Dlg3-208	ENSMUST00000151020.7	3316	No protein	Processed transcript	-	-	TSL:1
Dlg3-205	ENSMUST00000146772.1	559	No protein	Processed transcript	-	-	TSL:3
Dlg3-207	ENSMUST00000148076.1	326	No protein	Processed transcript	-	-	TSL:2
Dlg3-206	ENSMUST00000147863.7	5017	No protein	Retained intron	-	-	TSL:2

The strategy is based on the design of *Dlg3-202* transcript,the transcription is shown below:

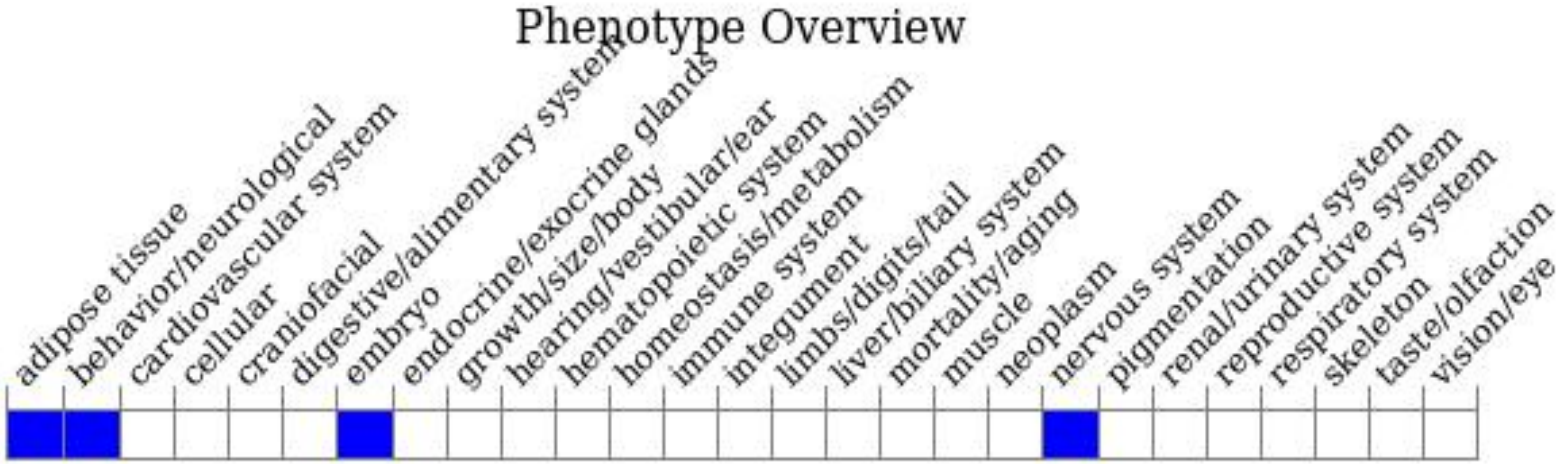
Genomic location distribution



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.

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