Pde4b Cas9-KO Strategy

Designer: Daohua Xu

Reviewer: Huimin Su

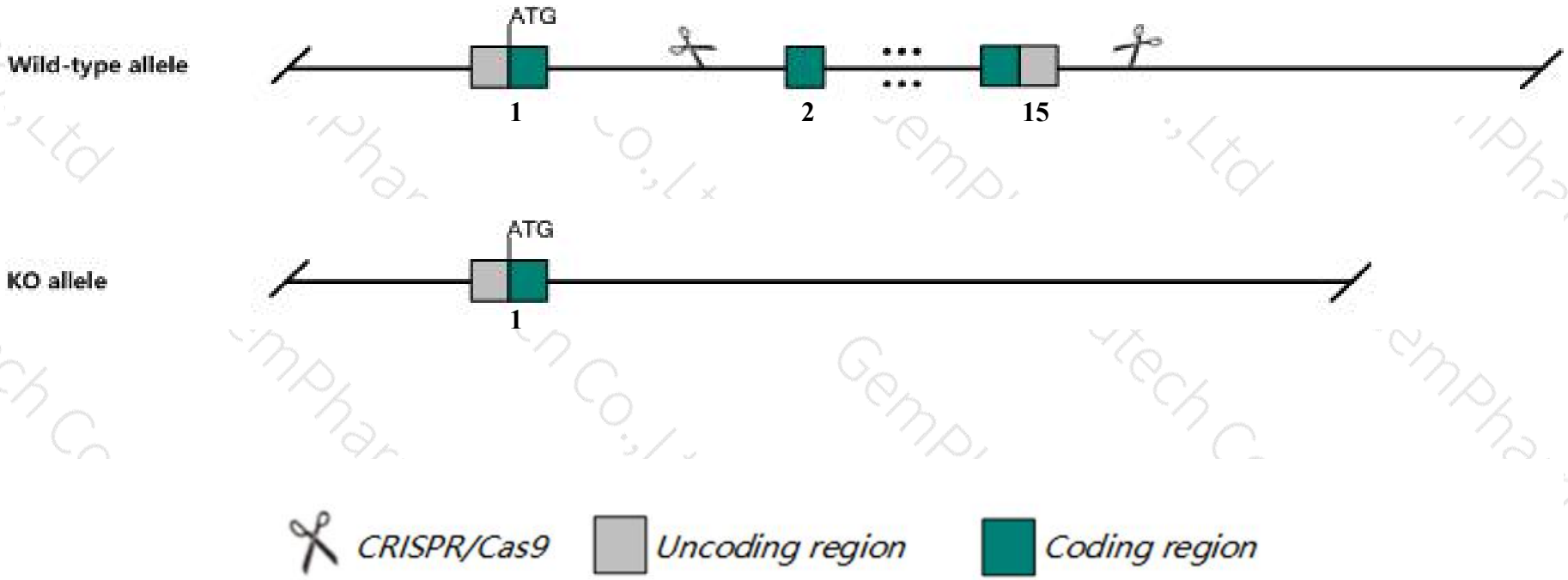
Design Date: 2019-9-10

Project Overview

Project Name	***Pde4b***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Pde4b* gene. The schematic diagram is as follows:



Technical routes

➢ The *Pde4b* gene has 13 transcripts. According to the structure of *Pde4b* gene, exon2-exon15 of *Pde4b-207* (ENSMUST00000106908.8) transcript is recommended as the knockout region.The region contains 1930bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Pde4b* gene. The brief process is as follows: CRISPR/Cas9 system

Notice

- According to the existing MGI data,Mice homozygous for disruptions in this gene produce significantly less TNF-alpha in response to lipopolysaccharide stimulation. One mutation resulted in brain and spinal cord vacuoles.

- The *Pde4b* 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 the gene knockout on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

Gene information（NCBI）

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Pde4b phosphodiesterase 4B, cAMP specific [Mus musculus (house mouse)]

Gene ID: 18578, updated on 31-Jan-2019

Summary

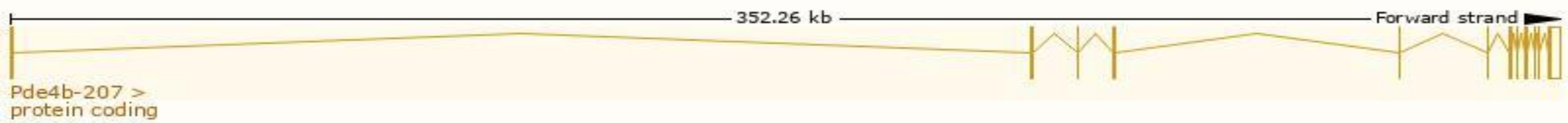
Official Symbol	Pde4b provided by MGI
Official Full Name	phosphodiesterase 4B, cAMP specific provided by MGI
Primary source	MGI:MGI:99557
See related	Ensembl:ENSMUSG00000028525
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Dpde4, R74983, dunce
Expression	Broad expression in cortex adult (RPKM 9.7), frontal lobe adult (RPKM 9.3) and 25 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

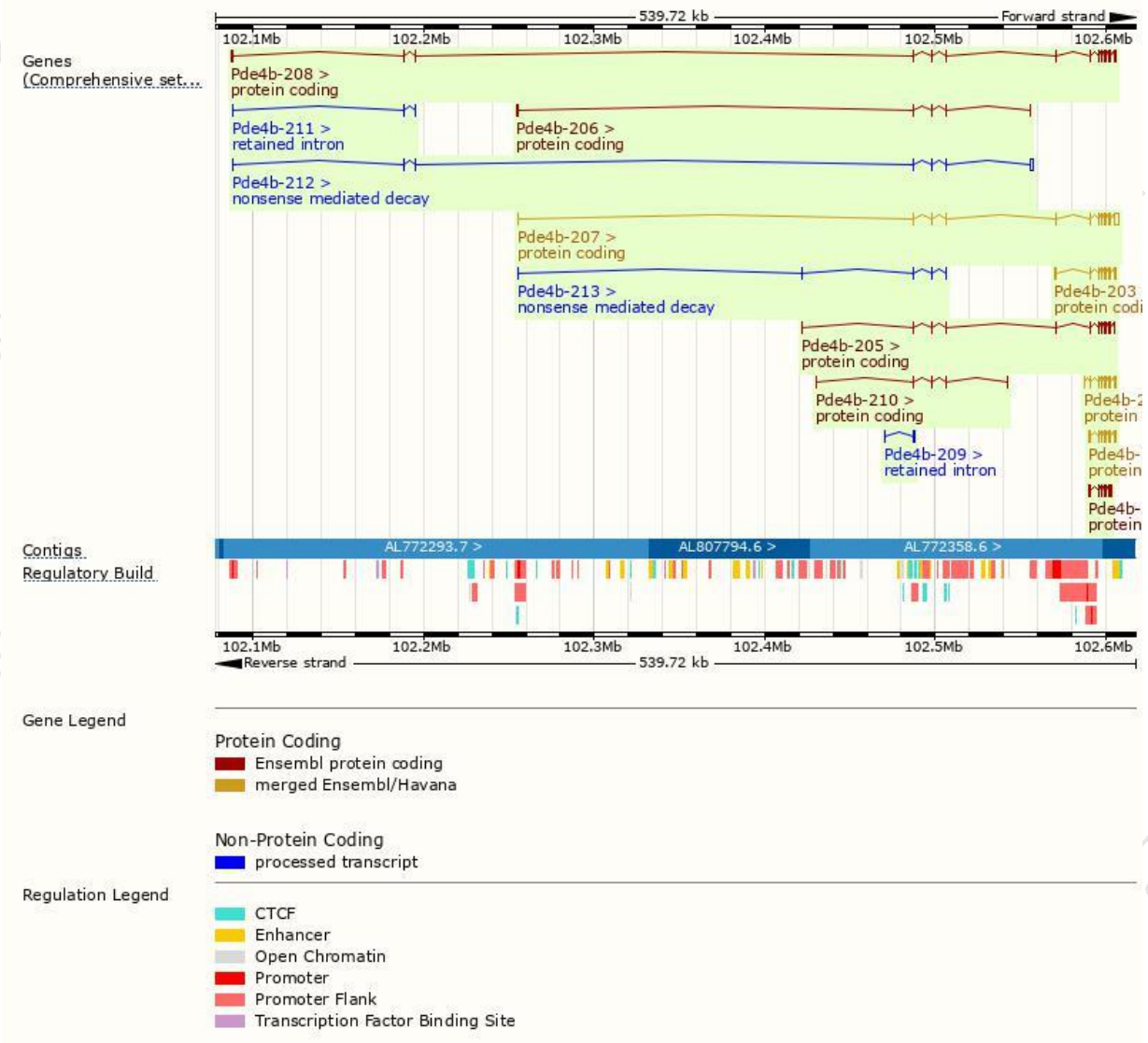
The gene has 13 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Pde4b-207	ENSMUST00000106908.8	4304	721aa	Protein coding	CCDS18403	Q8VBU5	TSL:1 GENCODE basic APPRIS P2
Pde4b-203	ENSMUST00000097950.8	2756	564aa	Protein coding	CCDS51243	B1AWD0	TSL:1 GENCODE basic
Pde4b-202	ENSMUST00000097949.10	2465	503aa	Protein coding	CCDS51244	Q6IQY6	TSL:1 GENCODE basic
Pde4b-201	ENSMUST00000030251.12	1923	484aa	Protein coding	CCDS51245	Q3TTI9	TSL:1 GENCODE basic
Pde4b-206	ENSMUST00000106907.8	1374	212aa	Protein coding	CCDS57289	Q80VK8	TSL:1 GENCODE basic
Pde4b-208	ENSMUST00000106911.7	3020	736aa	Protein coding	-	B1AWC9	TSL:5 GENCODE basic APPRIS ALT1
Pde4b-205	ENSMUST00000106904.8	2430	659aa	Protein coding	-	B1AWC8	TSL:5 GENCODE basic
Pde4b-204	ENSMUST00000106901.1	2129	402aa	Protein coding	-	B1AWD1	TSL:2 GENCODE basic
Pde4b-210	ENSMUST00000172616.1	823	161aa	Protein coding	-	G3UZ46	TSL:5 GENCODE basic
Pde4b-212	ENSMUST00000173119.7	2347	166aa	Nonsense mediated decay	-	G3UWT3	TSL:1
Pde4b-213	ENSMUST00000174186.1	848	121aa	Nonsense mediated decay	-	G3UZY9	CDS 5' incomplete TSL:5
Pde4b-209	ENSMUST00000133632.1	903	No protein	Retained intron	-	-	TSL:1
Pde4b-211	ENSMUST00000172845.1	476	No protein	Retained intron	-	-	TSL:2

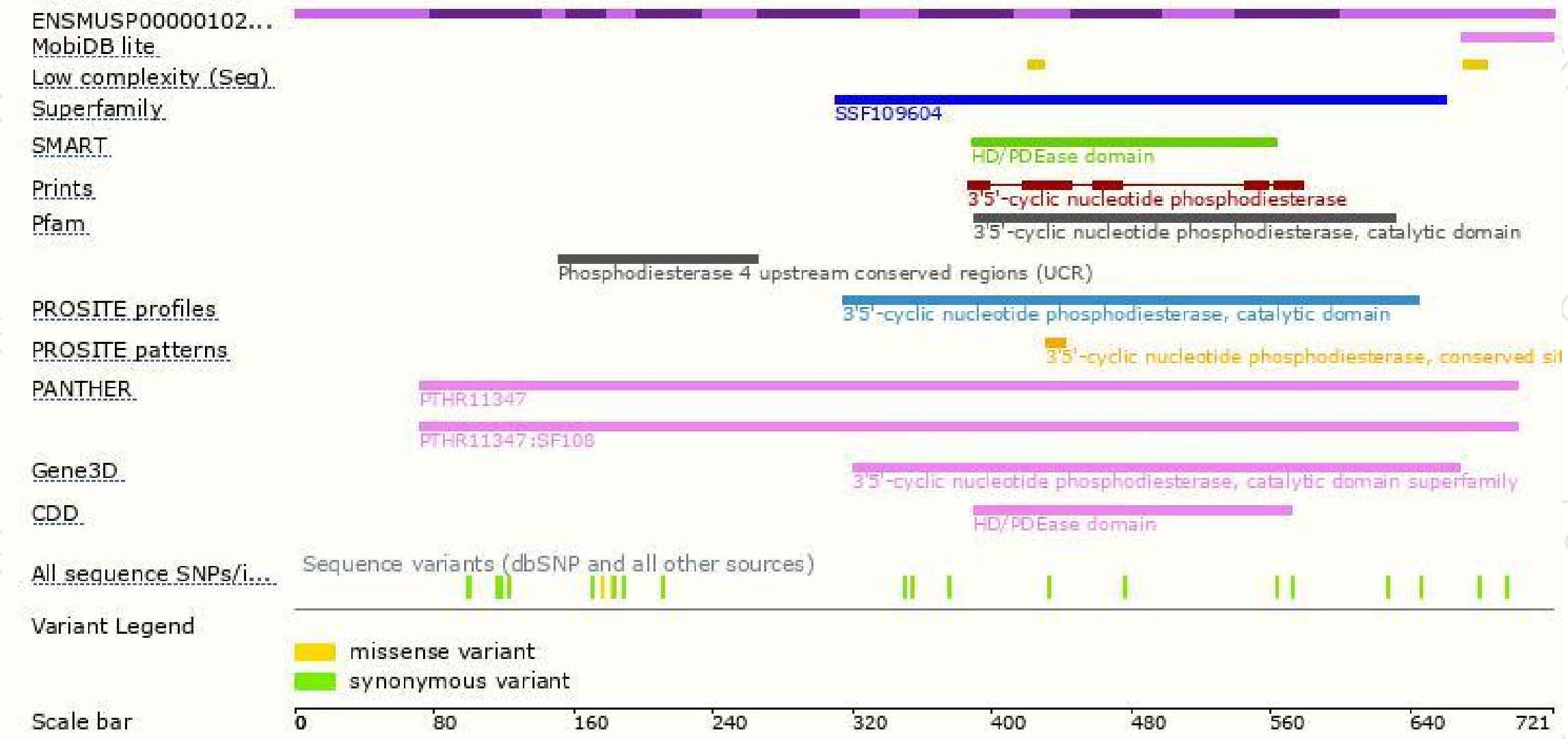
The strategy is based on the design of *Pde4b-207* transcript,The transcription is shown below



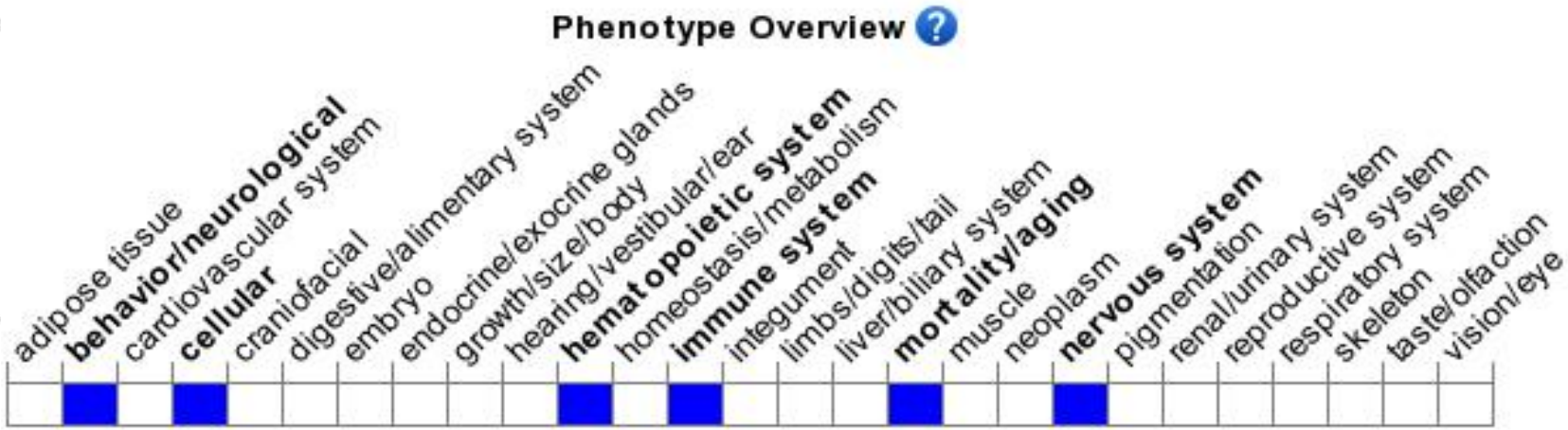
Genomic location distribution



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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GemPharmatech

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

Tel: 400-9660890

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GemPharmatech Co.,Ltd