Cdk6 Cas9-KO Strategy

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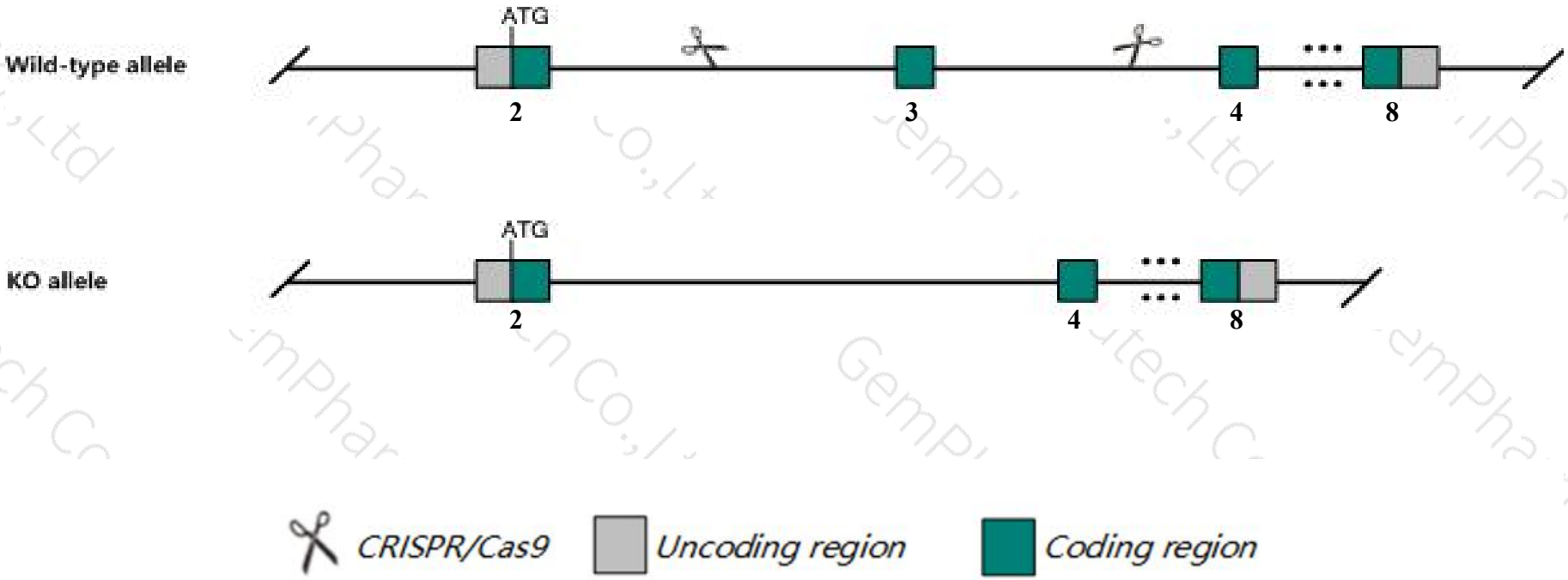
Project Overview

Project Name	***Cdk6***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Cdk6* gene. The schematic diagram is as follows:



Technical routes

➢ The *Cdk6* gene has 6 transcripts. According to the structure of *Cdk6* gene, exon3 of *Cdk6-202* (ENSMUST00000165117.7) transcript is recommended as the knockout region.The region contains 136bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Cdk6* gene. The brief process is as follows: CRISPR/Cas9 system

Notice

- According to the existing MGI data,Mice homozygous for disruptions in this gene display hematopoietic abnormalities affecting spleen and thymus size. Female body weight and fertility are also reduced.

- The *Cdk6* gene is located on the Chr5. 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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Cdk6 cyclin-dependent kinase 6 [Mus musculus (house mouse)]

Gene ID: 12571, updated on 31-Jan-2019

Summary

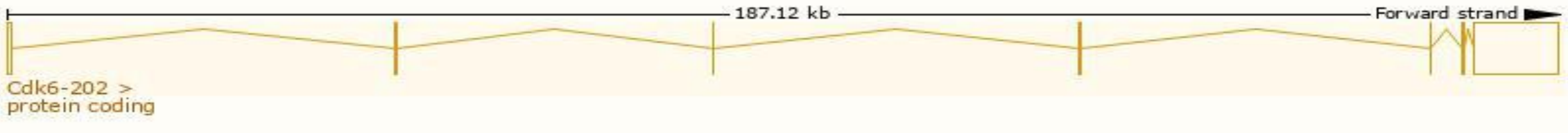
Official Symbol	Cdk6 provided by MGI
Official Full Name	cyclin-dependent kinase 6 provided by MGI
Primary source	MGI:MGI:1277162
See related	Ensembl:ENSMUSG00000040274
Gene type	protein coding
RefSeq status	REVIEWED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	AI504062, Crk2
Summary	This gene encodes a member of the cyclin dependent kinase family of proteins that play important roles in the progression and regulation of the cell cycle. The encoded protein binds to a D-type cyclin to form an active kinase complex to regulate progression through the G1 phase of the cell cycle. Mice lacking the encoded protein exhibit thymic and splenic hypoplasia, and hematopoietic defects such as reduced number of megakaryocytes and erythrocytes. A pseudogene of this gene has been defined on chromosome 4. [provided by RefSeq, Aug 2015]
Expression	Ubiquitous expression in thymus adult (RPKM 7.0), lung adult (RPKM 3.6) and 26 other tissuesSee more
Orthologs	human all

Transcript information（Ensembl）

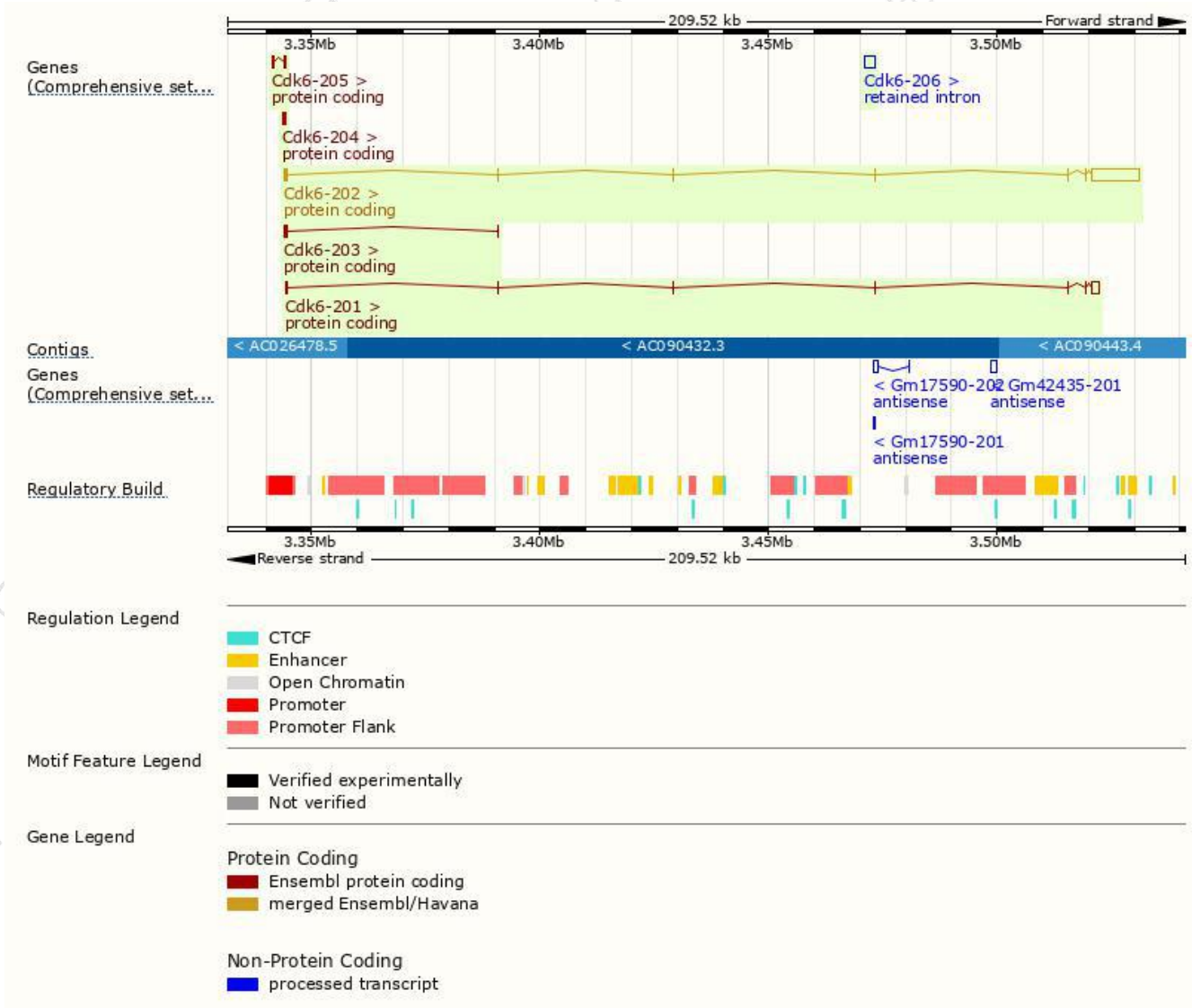
The gene has 6 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Cdk6-202	ENSMUST00000165117.7	11525	326aa	Protein coding	CCDS19062	Q0VBK8 Q64261	TSL:1 GENCODE basic APPRIS P1
Cdk6-201	ENSMUST00000042410.4	2470	326aa	Protein coding	CCDS19062	Q0VBK8 Q64261	TSL:1 GENCODE basic APPRIS P1
Cdk6-203	ENSMUST00000197385.1	697	82aa	Protein coding	-	A0A0G2JGA8	CDS 3' incomplete TSL:2
Cdk6-205	ENSMUST00000199156.1	425	29aa	Protein coding	-	A0A0G2JGH2	CDS 3' incomplete TSL:5
Cdk6-204	ENSMUST00000197607.1	376	23aa	Protein coding	-	A0A0G2JEJ6	CDS 3' incomplete TSL:3
Cdk6-206	ENSMUST00000199396.1	2232	No protein	Retained intron	-	-	TSL:NA

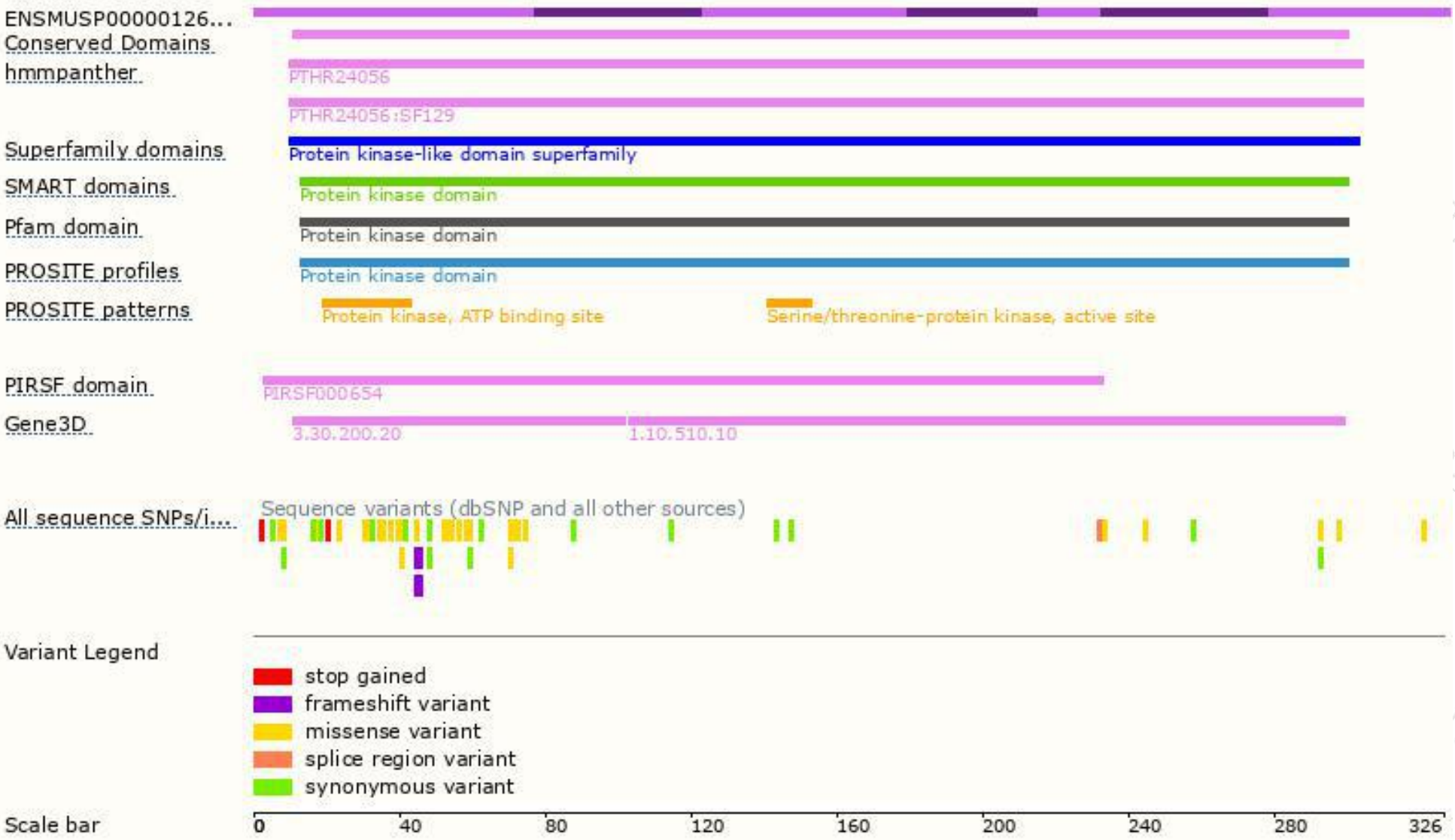
The strategy is based on the design of *Cdk6-202* transcript,The transcription is shown below



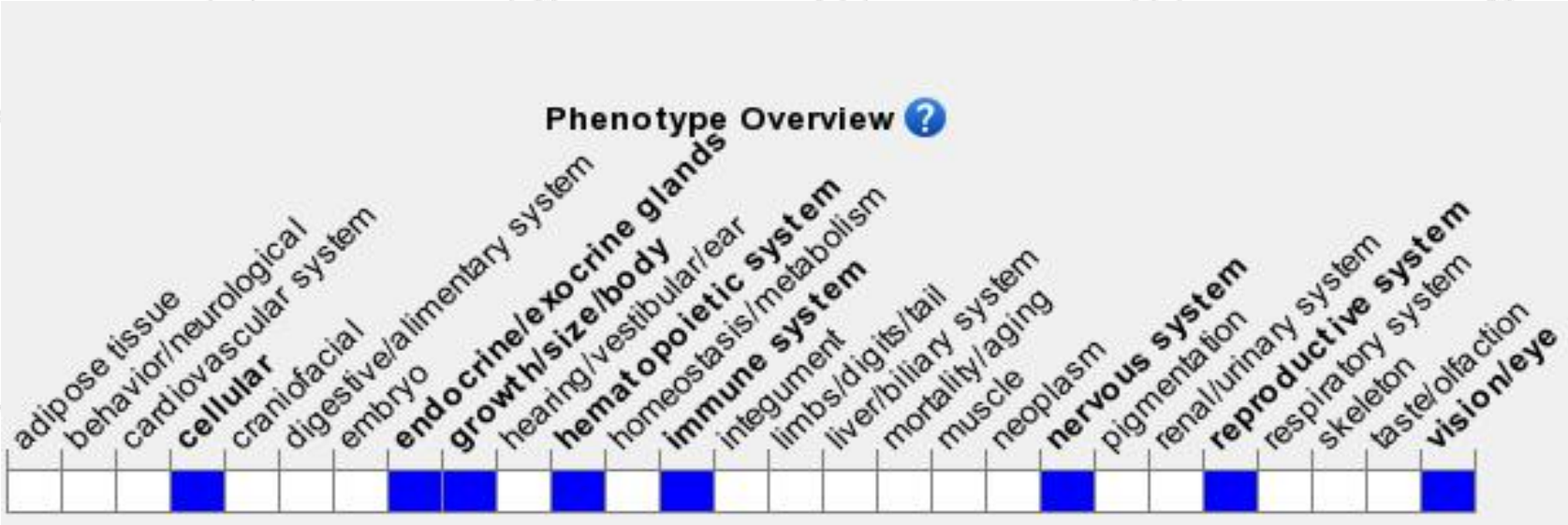
Genomic location distribution



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/).

According to the existing MGI data,Mice homozygous for disruptions in this gene display hematopoietic abnormalities affecting spleen and thymus size. Female body weight and fertility are also reduced.

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

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