Tbk1 Cas9-KO Strategy

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Project Overview

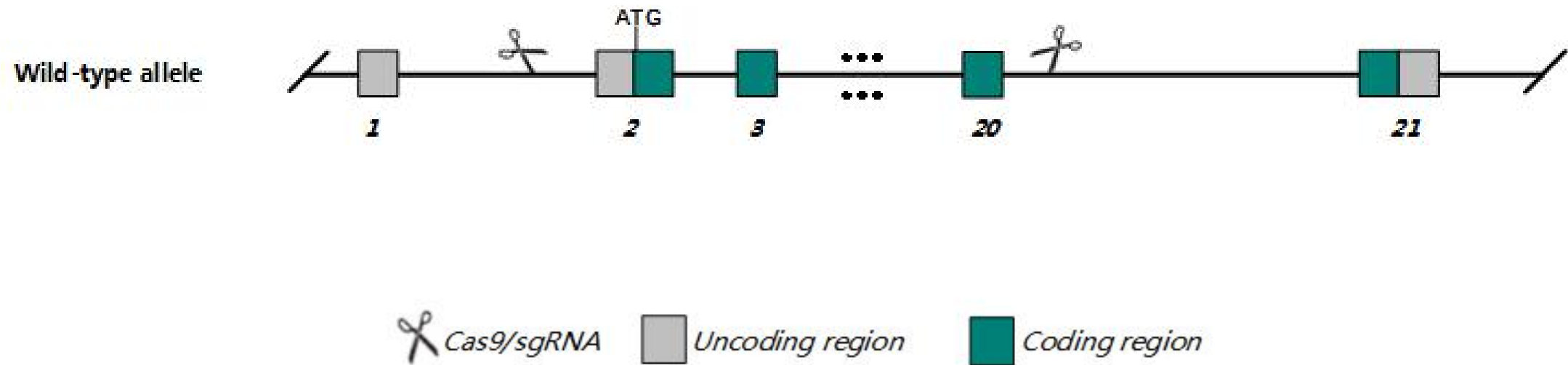|	
Project Name	***Tbk1***
Project type	**Cas9-KO**
Strain background	**C57BL/6J**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Tbk1* gene. The schematic diagram is as follows:

Technical routes

➢ The *Tbk1* gene has 7 transcripts. According to the structure of *Tbk1* gene, exon2-exon20 of *Tbk1-201* (ENSMUST00000020316.3) transcript is recommended as the knockout region. The region contains start codon ATG. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Tbk1* gene. The brief process is as follows: sgRNA was transcribed in vitro. Cas9 and sgRNA were microinjected into the fertilized eggs of C57BL/6J 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/6J mice.

Notice

➢ According to the existing MGI data,Homozygous null mice display embryonic lethality. Mice homozygous for a different knock-out allele exhibit increased prenatal lethality, increased infiltration of mononuclear and/or granulomatous cells in multiple organs and tissues at 3 months of age, and increased lethality in response to LPS.

➢ The *Tbk1* gene is located on the Chr10. 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）

Tbk1 TANK-binding kinase 1 [Mus musculus (house mouse)]

Gene ID: 56480, updated on 31-Jan-2019

▲ Summary

|	
Official Symbol	Tbk1 provided by MGI
Official Full Name	TANK-binding kinase 1 provided by MGI
Primary source	MGI:MGI:1929658
See related	Ensembl:ENSMUSG00000020115
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	1200008B05Rik, AI462036, AW048562
Expression	Ubiquitous expression in bladder adult (RPKM 7.5), CNS E11.5 (RPKM 7.4) and 28 other tissuesSee more
Orthologs	human all

Transcript information（Ensembl）

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

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Tbk1-201	ENSMUST00000020316.3	3024	729aa	Protein coding	CCDS24212	A1L361 Q9WUN2	TSL:1 GENCODE basic APPRIS P1
Tbk1-206	ENSMUST0000219493.1	442	108aa	Protein coding	-	A0A1W2P835	CDS 3' incomplete TSL:3
Tbk1-204	ENSMUST00000219400.1	3005	121aa	Nonsense mediated decay	-	A0A1W2P6W7	TSL:2
Tbk1-202	ENSMUST00000218460.1	406	No protein	Processed transcript	-	-	TSL:3
Tbk1-207	ENSMUST00000220386.1	747	No protein	Retained intron	-	-	TSL:3
Tbk1-203	ENSMUST00000219244.1	634	No protein	Retained intron	-	-	TSL:3
Tbk1-205	ENSMUST00000219439.1	485	No protein	Retained intron	-	-	TSL:3

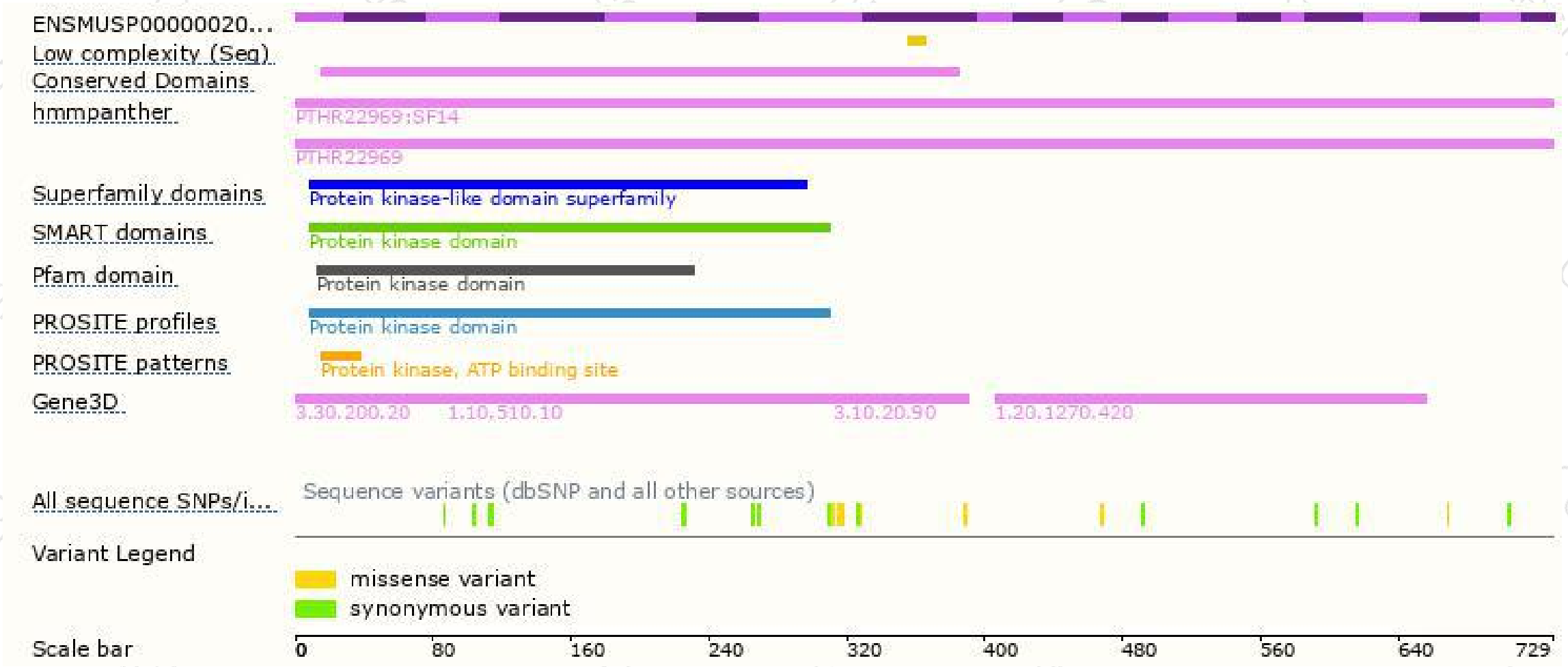The strategy is based on the design of *Tbk1-201* transcript,The transcription is shown below

< Tbk1-201
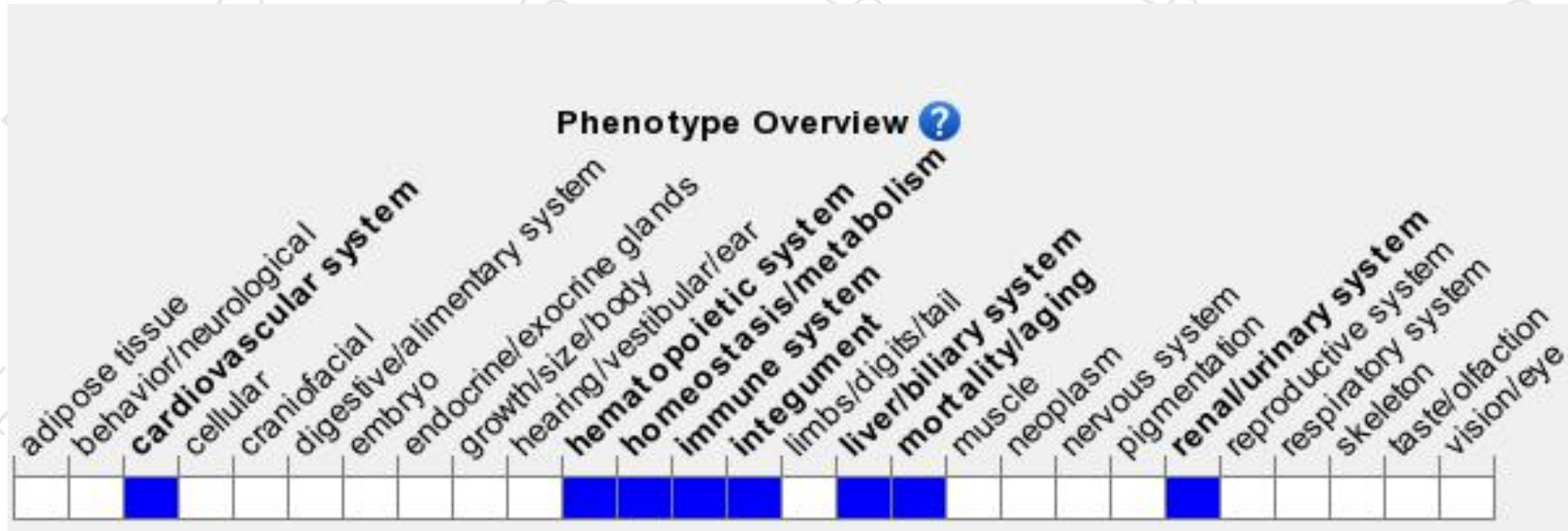protein coding

◄ Reverse strand

40.33 kb
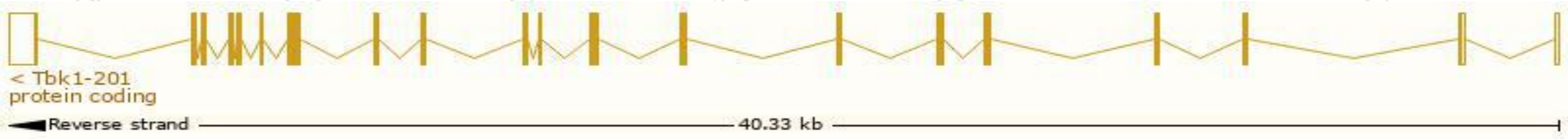
Genomic location distribution
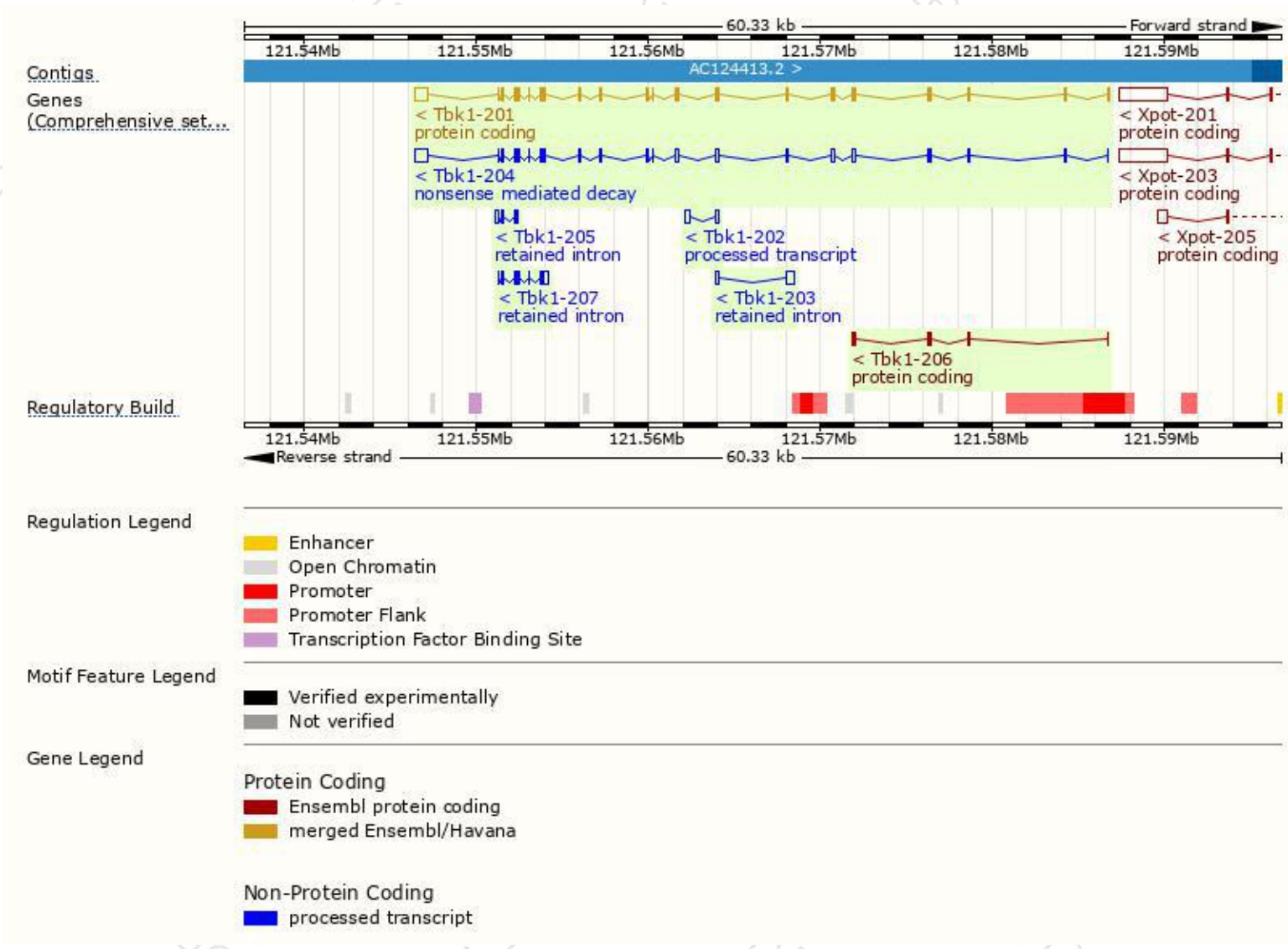
Protein domain

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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