Bnip2 Cas9-CKO Strategy

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Project Overview

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Project Name	***Bnip2***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

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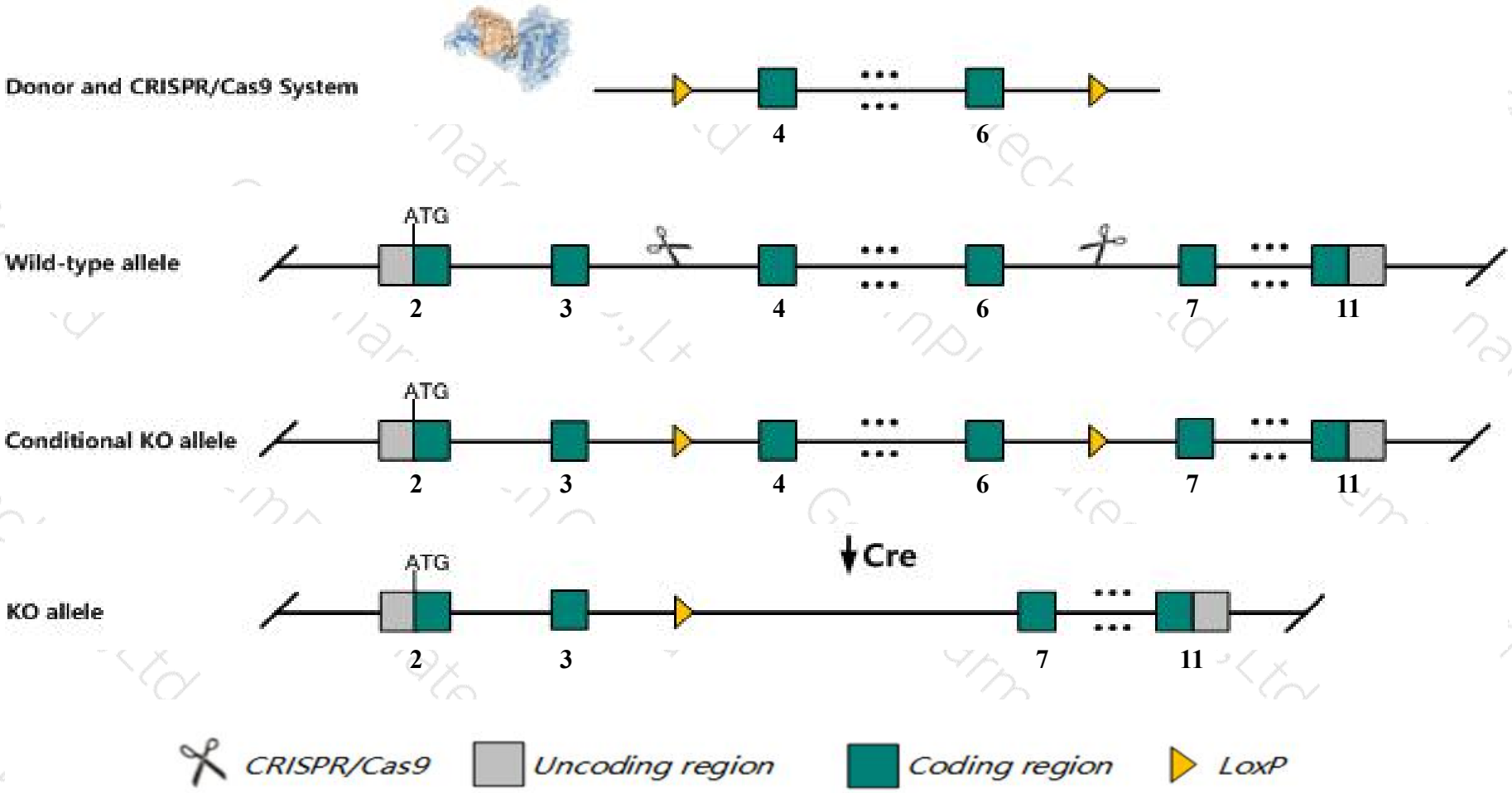
This model will use CRISPR/Cas9 technology to edit the *Bnip2* gene. The schematic diagram is as follows:



Technical routes

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- The *Bnip2* gene has 8 transcripts. According to the structure of *Bnip2* gene, exon4-exon6 of *Bnip2-201* (ENSMUST00000034754.11) transcript is recommended as the knockout region.The region contains 457bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Bnip2* 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.

Notice

- The *Bnip2* gene is located on the Chr9. 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.

- Some amino acids will remain at the N-terminus and some functions may be retained.

- 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）

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Bnip2 BCL2/adenovirus E1B interacting protein 2 [Mus musculus (house mouse)]

Gene ID: 12175, updated on 31-Jan-2019

Summary

Official Symbol	Bnip2 provided by MGI
Official Full Name	BCL2/adenovirus E1B interacting protein 2 provided byMGI
Primary source	MGI:MGI:109327
See related	Ensembl:ENSMUSG00000011958
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	5730523P12Rik, BNIP2beta, Nip21
Expression	Ubiquitous expression in bladder adult (RPKM 17.0), CNS E11.5 (RPKM 12.5) and 26 other tissuesSee more
Orthologs	human all

Transcript information（Ensembl）

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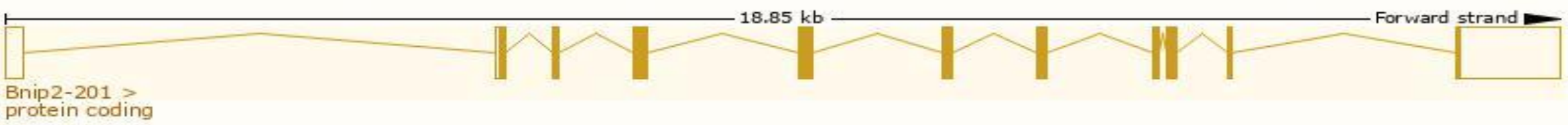
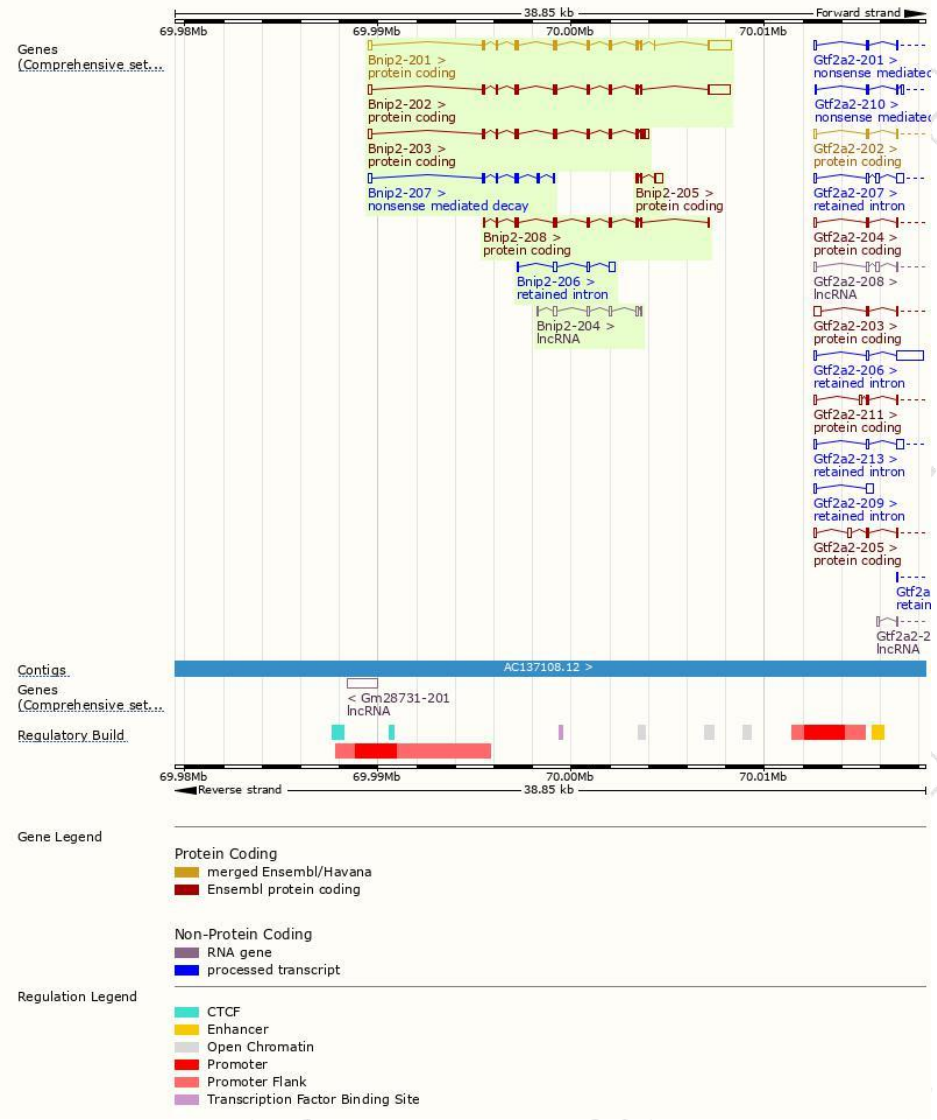
The gene has 8 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Bnip2-201	ENSMUST00000034754.11	2464	326aa	Protein coding	CCDS23319	O54940	TSL:1 GENCODE basic APPRIS P4
Bnip2-202	ENSMUST00000085393.12	2328	314aa	Protein coding	CCDS23318	Q91VL0	TSL:1 GENCODE basic APPRIS ALT2
Bnip2-208	ENSMUST00000165389.7	945	314aa	Protein coding	CCDS23318	Q91VL0	TSL:1 GENCODE basic APPRIS ALT2
Bnip2-203	ENSMUST00000117450.7	1465	348aa	Protein coding	-	G5E8U9	TSL:1 GENCODE basic APPRIS ALT2
Bnip2-205	ENSMUST00000137472.1	644	86aa	Protein coding	-	F6VF29	CDS 5' incomplete TSL:3
Bnip2-207	ENSMUST00000154772.7	676	107aa	Nonsense mediated decay	-	D6RE50	TSL:3
Bnip2-206	ENSMUST00000143049.7	621	No protein	Retained intron	-	-	TSL:2
Bnip2-204	ENSMUST00000133307.1	643	No protein	lncRNA	-	-	TSL:3

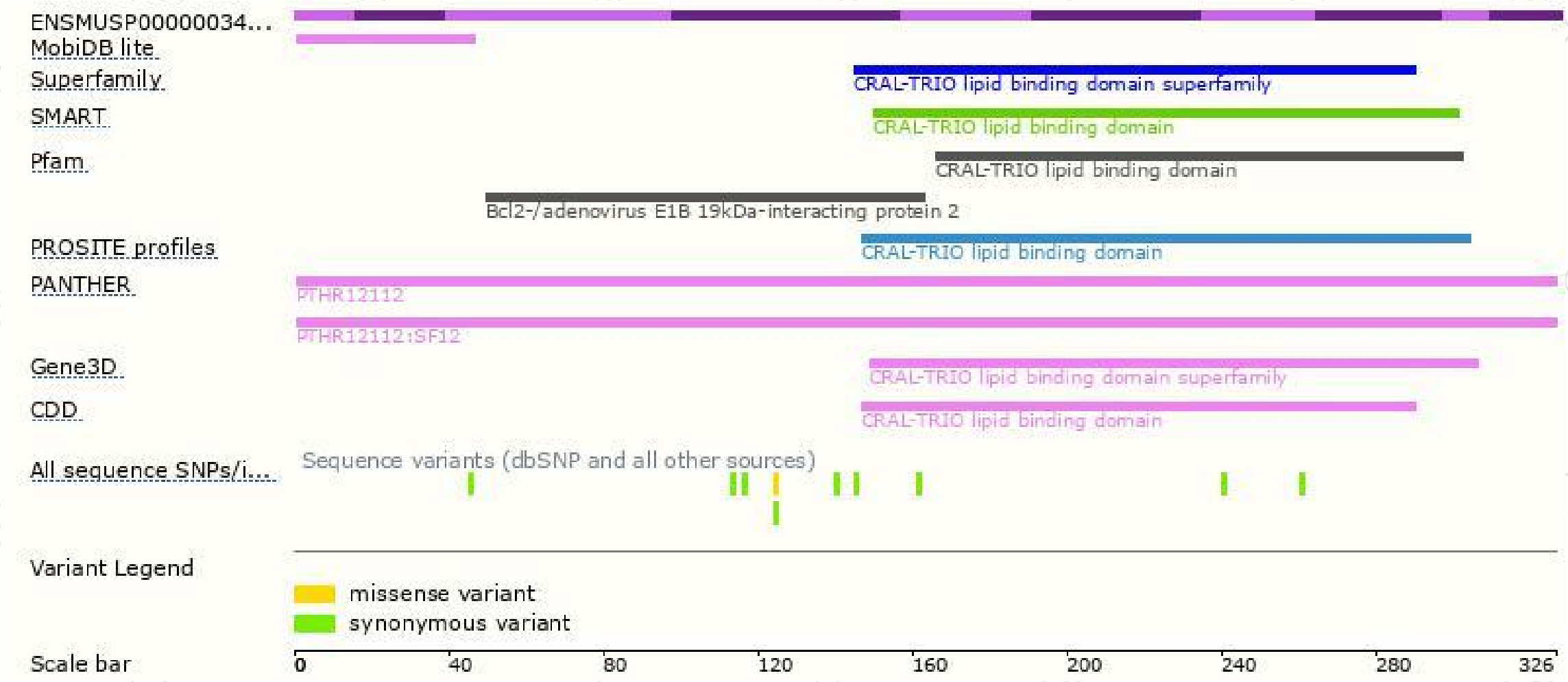
The strategy is based on the design of *Bnip2-201* transcript,The transcription is shown below



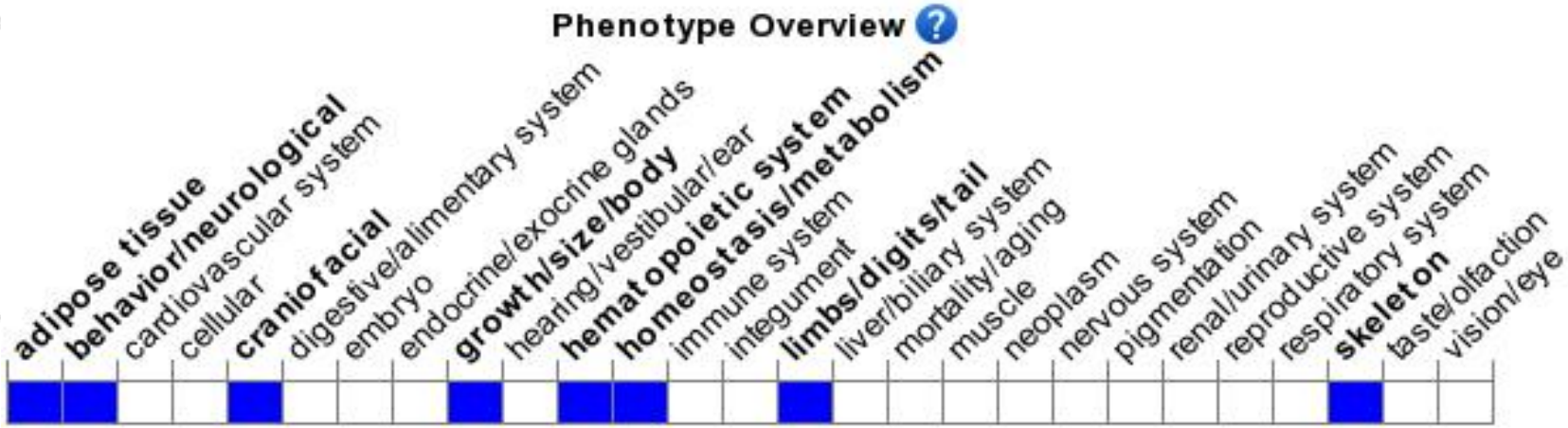
Genomic location distribution



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/).

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