Ascl1 Cas9-KO Strategy

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Reviewer: Huimin Su

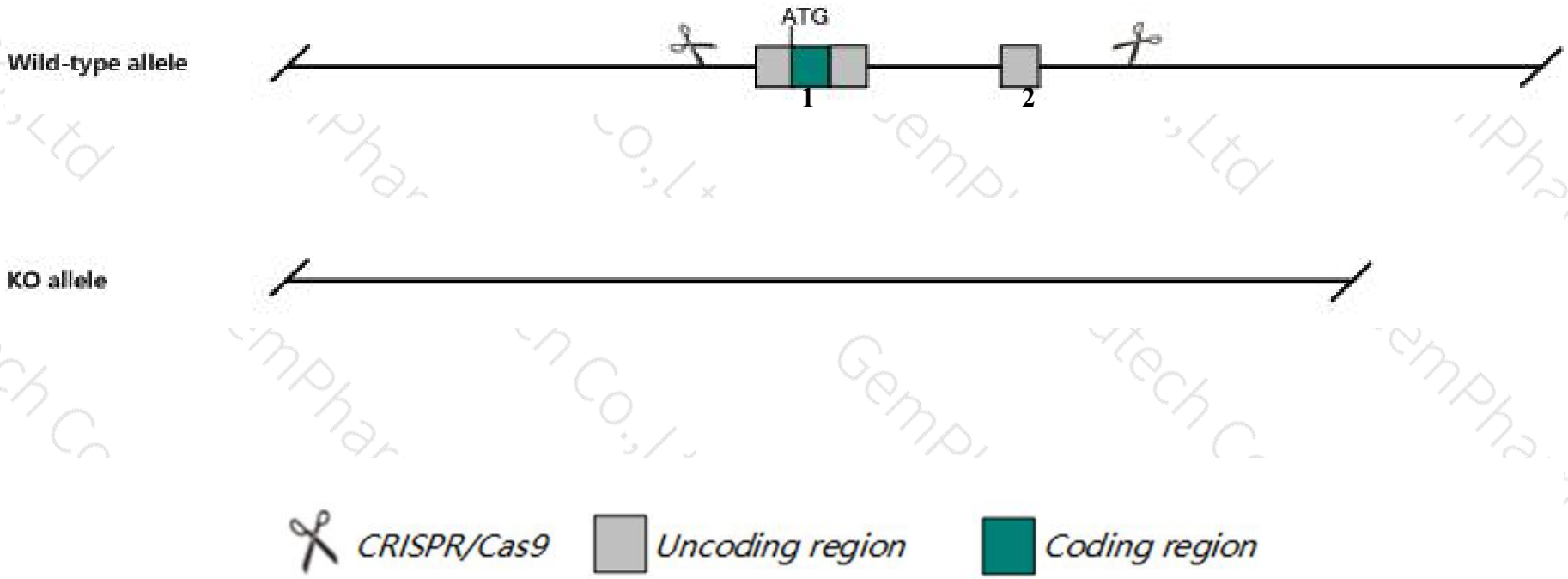
Design Date: 2019-9-10

Project Overview

Project Name	***Ascl1***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Ascl1* gene. The schematic diagram is as follows:



Technical routes

➢ The *Ascl1* gene has 1 transcript. According to the structure of *Ascl1* gene, exon1-exon2 of *Ascl1-201* (ENSMUST00000020243.9) 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 *Ascl1* gene. The brief process is as follows: CRISPR/Cas9 system

Notice

- According to the existing MGI data,Homozygous null mutants show impaired development of olfactory, sympathetic, parasympathetic, and enteric ganglia, lung neuroendocrine and adrenal chromaffin cells, and various brain centers, and die at birth with feeding and breathing problems.

- The *Ascl1* 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）

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Ascl1 achaete-scute family bHLH transcription factor 1 [Mus musculus (house mouse)]

Gene ID: 17172, updated on 19-Mar-2019

Summary

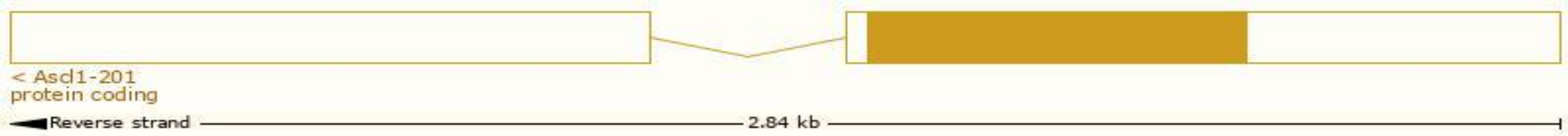
Official Symbol	Ascl1 provided by MGI
Official Full Name	achaete-scute family bHLH transcription factor 1 provided by MGI
Primary source	MGI:MGI:96919
See related	Ensembl:ENSMUSG00000020052
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	AI225900, ASH1, Mash1, bHLHa46
Expression	Biased expression in CNS E11.5 (RPKM 24.4), whole brain E14.5 (RPKM 15.3) and 4 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

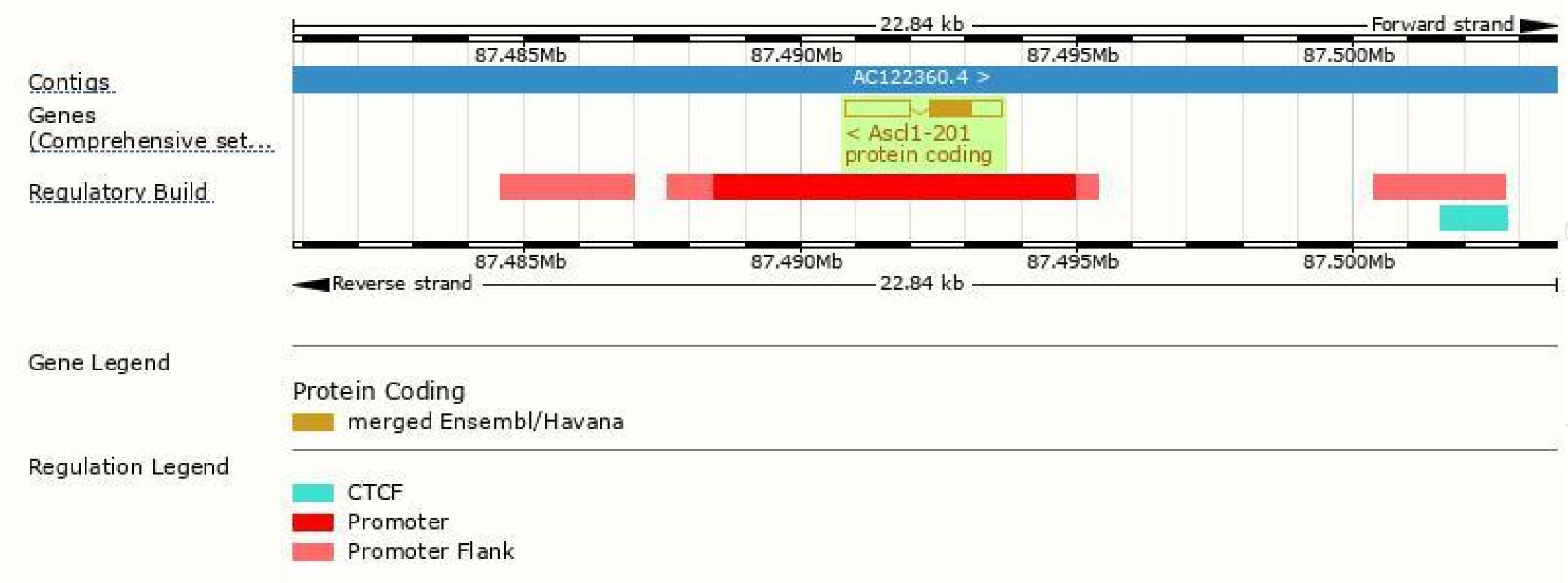
The gene has 1 transcript,and the transcript is shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Ascl1-201	ENSMUST00000020243.9	2481	231aa	Protein coding	CCDS24101	Q02067	TSL:1 GENCODE basic APPRIS P1

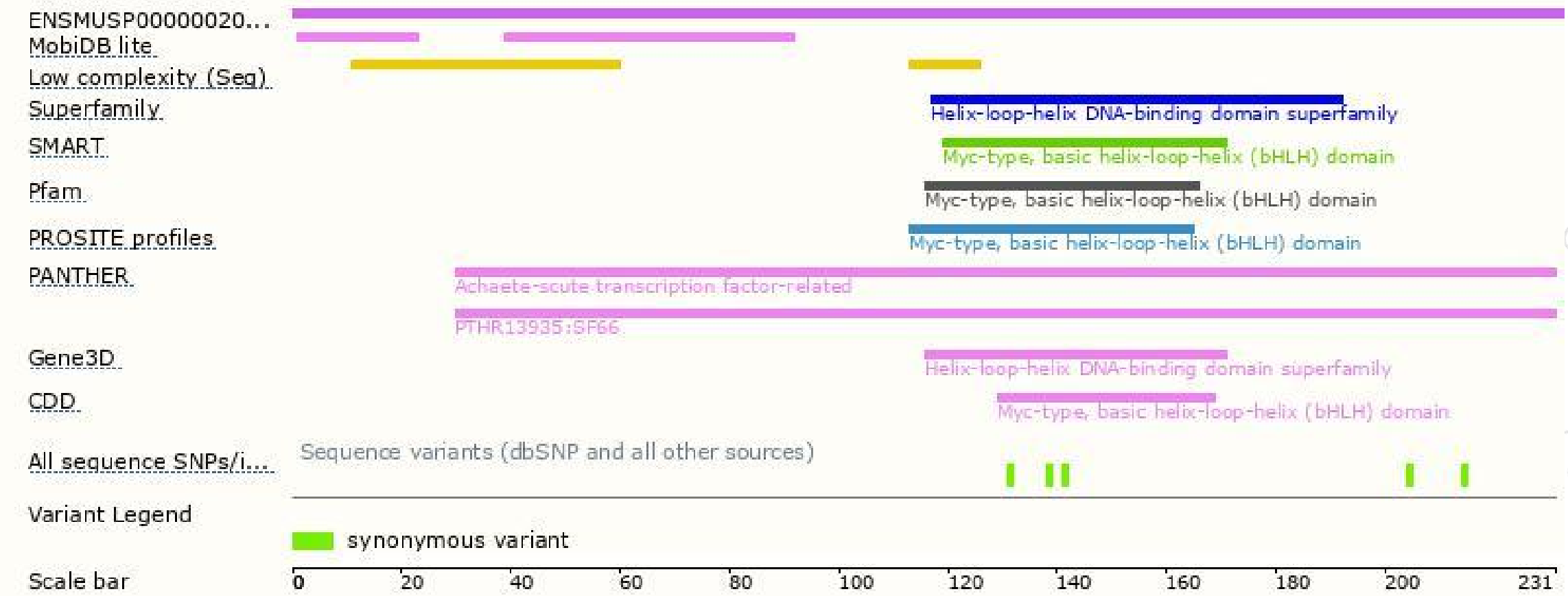
The strategy is based on the design of *Ascl1-201* transcript,The transcription is shown below



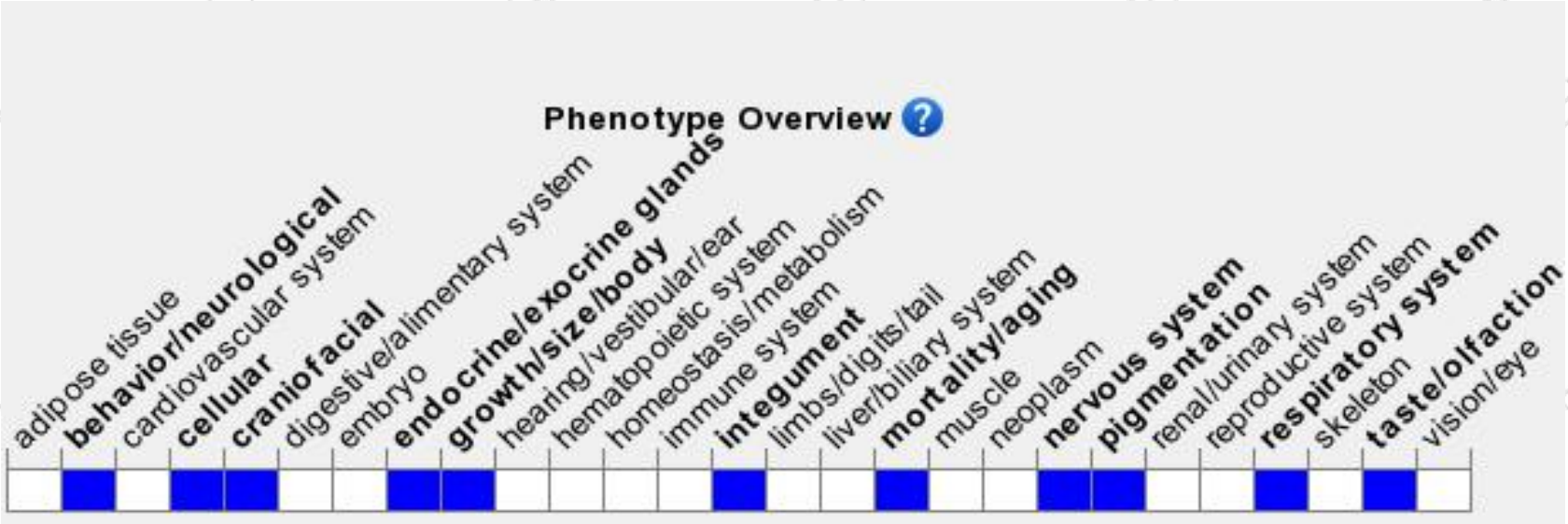
Genomic location distribution



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/).

According to the existing MGI data,Homozygous null mutants show impaired development of olfactory, sympathetic, parasympathetic, and enteric ganglia, lung neuroendocrine and adrenal chromaffin cells, and various brain centers, and die at birth with feeding and breathing problems.

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

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