

Rfc1 Cas9-CKO Strategy

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Reviewer:

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Project Overview

Project Name

Rfc1

Project type

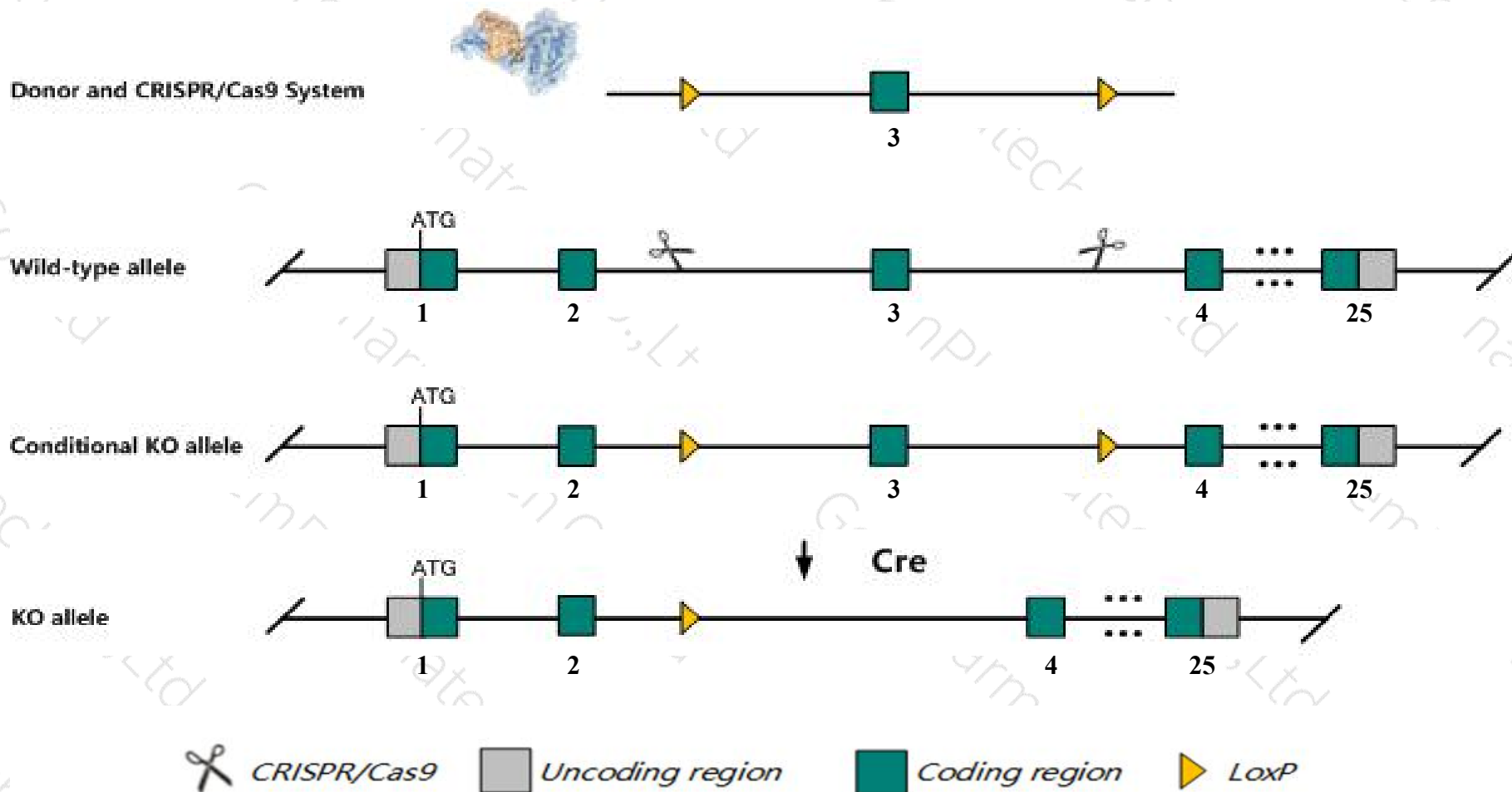
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Rfc1* gene. The schematic diagram is as follows:



Technical routes

- The *Rfc1* gene has 7 transcripts. According to the structure of *Rfc1* gene, exon3 of *Rfc1*-206 (ENSMUST00000204965.2) transcript is recommended as the knockout region. The region contains 76bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Rfc1* 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 *Rfc1* 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at existing technological level.

Gene information (NCBI)

Rfc1 replication factor C (activator 1) 1 [*Mus musculus* (house mouse)]

Gene ID: 19687, updated on 12-Aug-2019

Summary

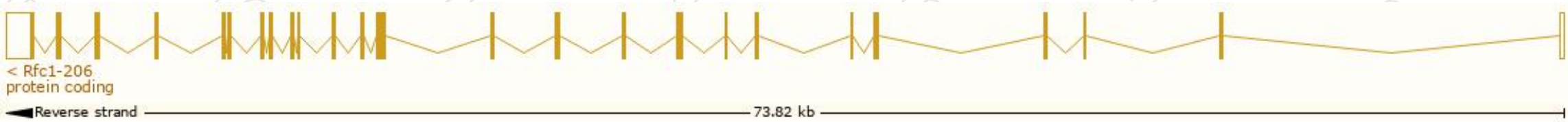
Official Symbol	Rfc1 provided by MGI
Official Full Name	replication factor C (activator 1) 1 provided by MGI
Primary source	MGI:MGI:97891
See related	Ensembl:ENSMUSG00000029191
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Recc1; 140kDa; Alp145; RFC140
Expression	Ubiquitous expression in CNS E11.5 (RPKM 10.8), limb E14.5 (RPKM 8.3) and 28 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

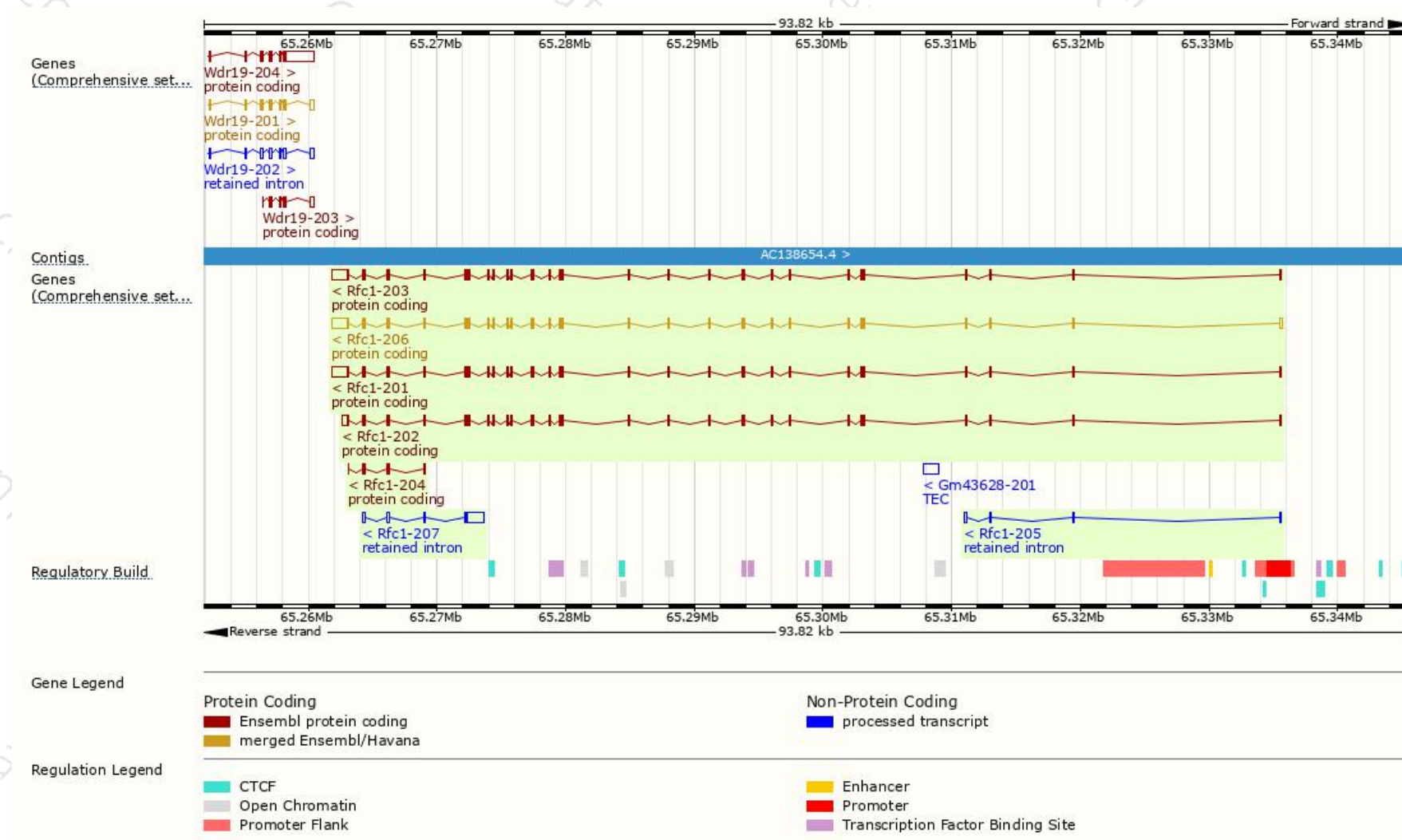
The gene has 7 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Rfc1-206	ENSMUST00000204965.2	4751	1131aa	Protein coding	CCDS39096	G3X8Z6	TSL:1 GENCODE basic APPRIS P3
Rfc1-201	ENSMUST00000172732.7	4699	1130aa	Protein coding	CCDS84884	A0A0N5E9G7	TSL:1 GENCODE basic APPRIS ALT2
Rfc1-202	ENSMUST00000203471.2	3952	1132aa	Protein coding	CCDS84885	Q5U4B1	TSL:1 GENCODE basic APPRIS ALT2
Rfc1-203	ENSMUST00000203581.2	4689	1145aa	Protein coding	-	G3UWX1	TSL:1 GENCODE basic APPRIS ALT2
Rfc1-204	ENSMUST00000203596.1	638	212aa	Protein coding	-	A0A0N4SVN6	CDS 5' and 3' incomplete TSL:2
Rfc1-207	ENSMUST00000205063.1	1954	No protein	Retained intron	-	-	TSL:1
Rfc1-205	ENSMUST00000203644.1	485	No protein	Retained intron	-	-	TSL:1

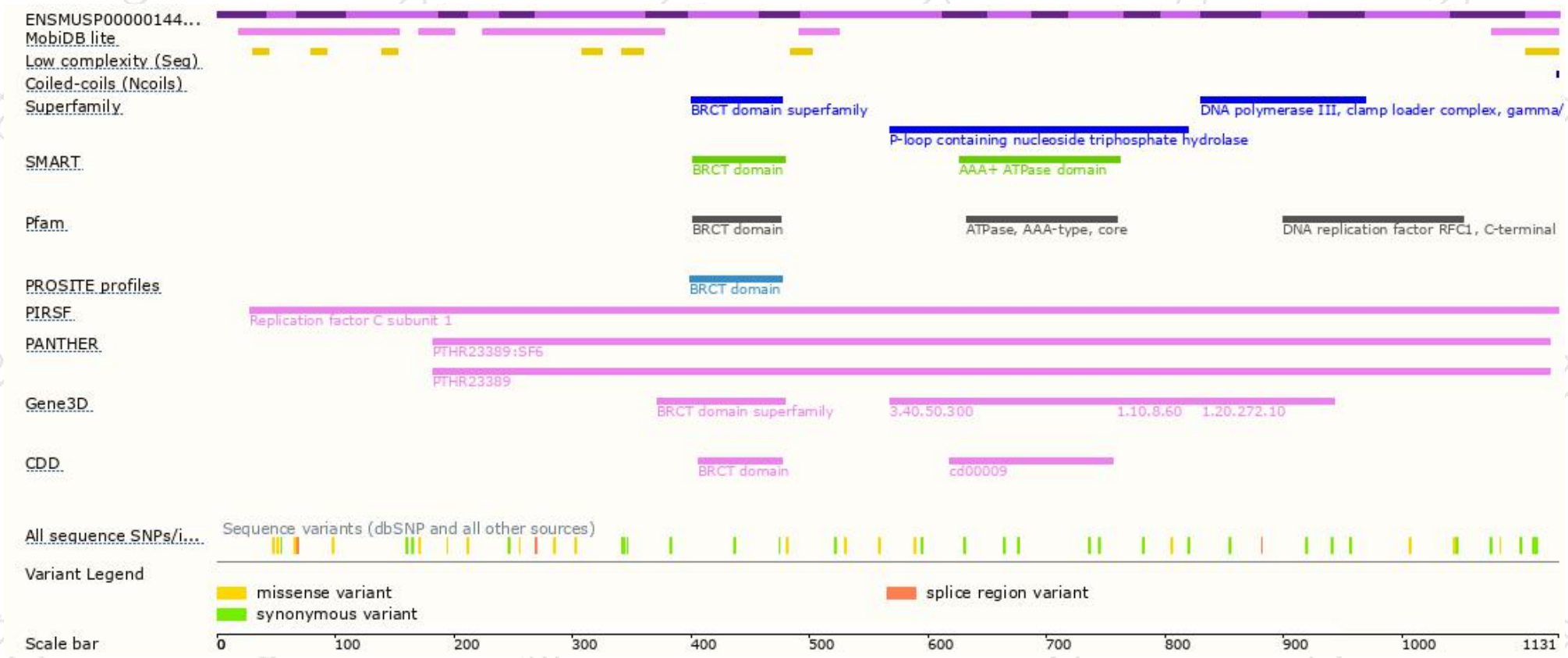
The strategy is based on the design of *Rfc1-206* transcript,The transcription is shown below



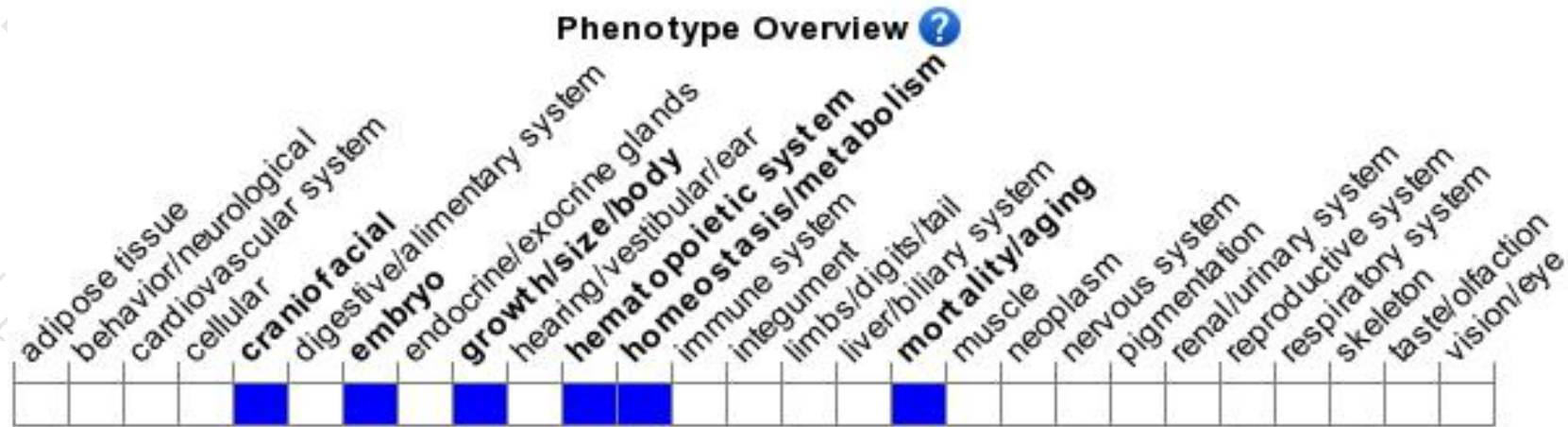
Genomic location distribution



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/>).

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

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