

Mgp Cas9-KO Strategy

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Project Overview

Project Name

Mgp

Project type

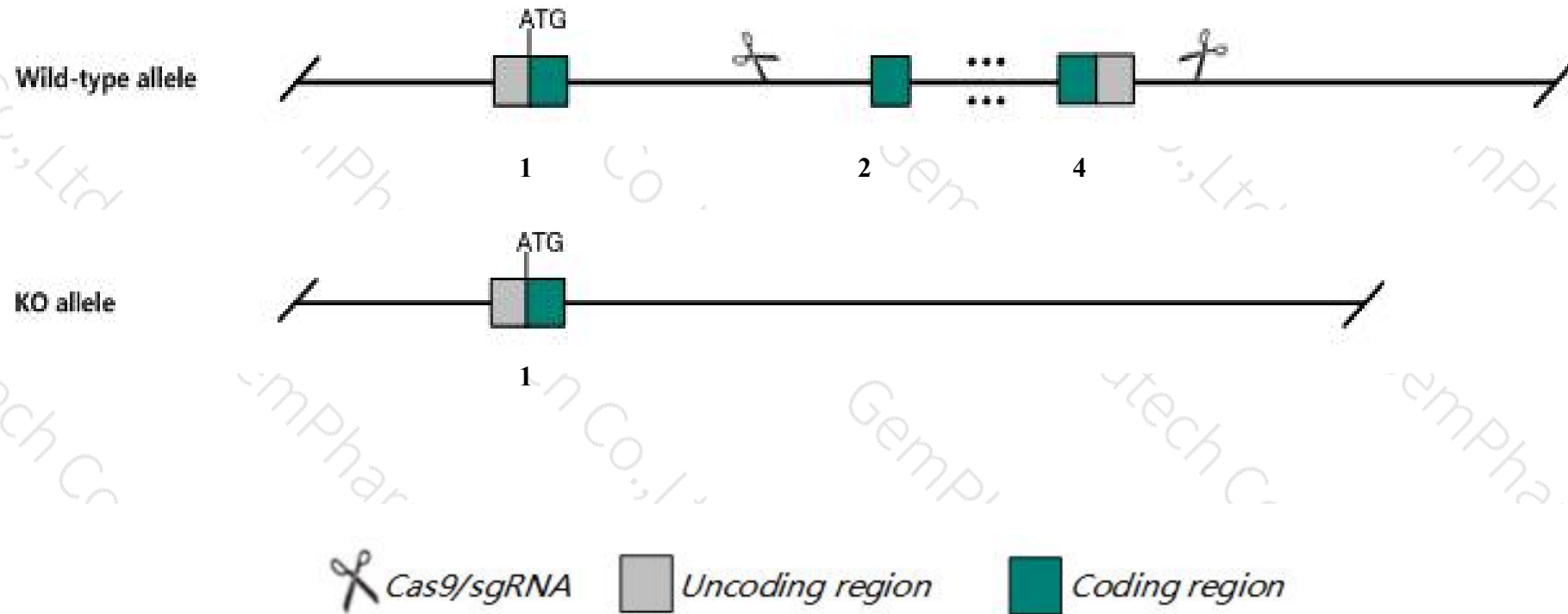
Cas9-KO

Strain background

C57BL/6J

Knockout strategy

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



- The *Mgp* gene has 2 transcripts. According to the structure of *Mgp* gene, exon2-exon4 of *Mgp-201* (ENSMUST00000032342.2) transcript is recommended as the knockout region. The region contains 254bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Mgp* 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.

- According to the existing MGI data, Homozygotes for a targeted null mutation exhibit growth plate calcification leading to reduced stature, osteopenia, and fractures, and arterial calcification and rupture resulting in death by eight weeks of age.
- The *Mgp* gene is located on the Chr6. 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)

Mgp matrix Gla protein [Mus musculus (house mouse)]

Gene ID: 17313, updated on 31-Jan-2019

Summary



Official Symbol Mgp provided by [MGI](#)

Official Full Name matrix Gla protein provided by [MGI](#)

Primary source [MGI:MGI:96976](#)

See related [Ensembl:ENSMUSG00000030218](#)

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 Mglap

Summary This gene encodes a member of the osteocalcin/matrix Gla family of proteins. The encoded vitamin K-dependent protein is secreted by chondrocytes and vascular smooth muscle cells, and functions as a physiological inhibitor of ectopic tissue calcification. This protein also inhibits angiogenesis. Mice lacking a functional copy of this gene exhibit impaired differentiation of endothelial cells, reduced stature, and calcification and rupture of the vasculature leading to premature death. [provided by RefSeq, Sep 2016]

Expression Biased expression in bladder adult (RPKM 1368.5), lung adult (RPKM 1296.7) and 11 other tissues [See more](#)

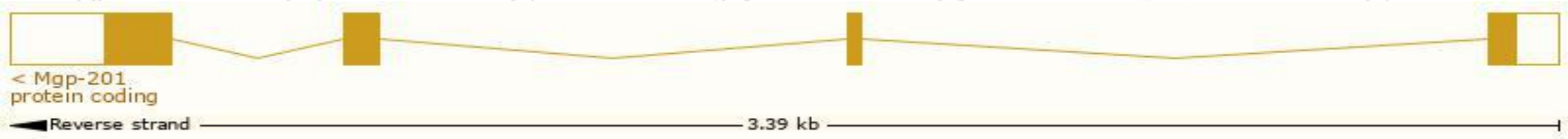
Orthologs [human](#) [all](#)

Transcript information (Ensembl)

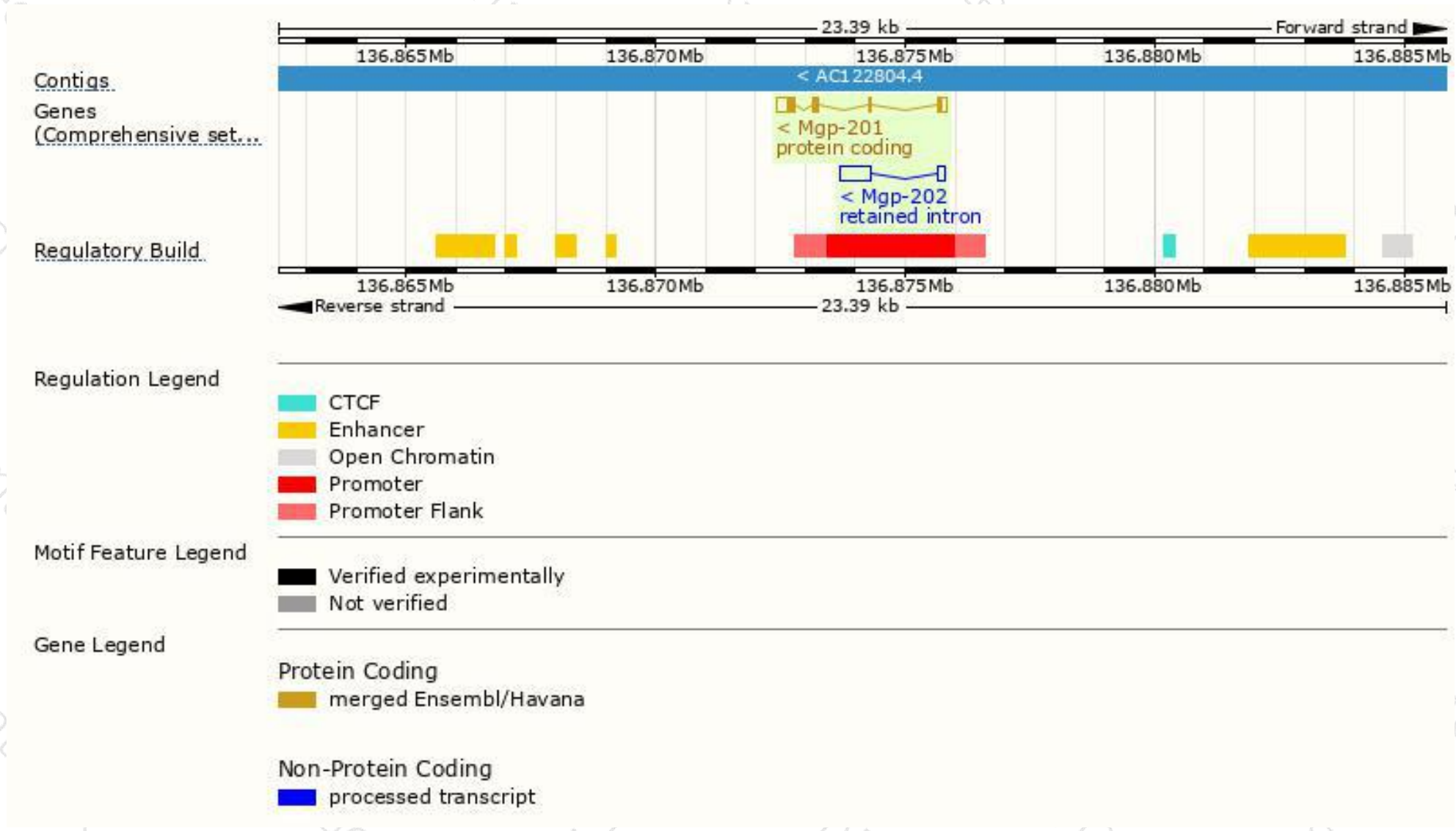
The gene has 2 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Mgp-201	ENSMUST00000032342.2	617	104aa	Protein coding	CCDS20659	P19788	TSL:1 GENCODE basic APPRIS P1
Mgp-202	ENSMUST00000203103.1	715	No protein	Retained intron	-	-	TSL:2

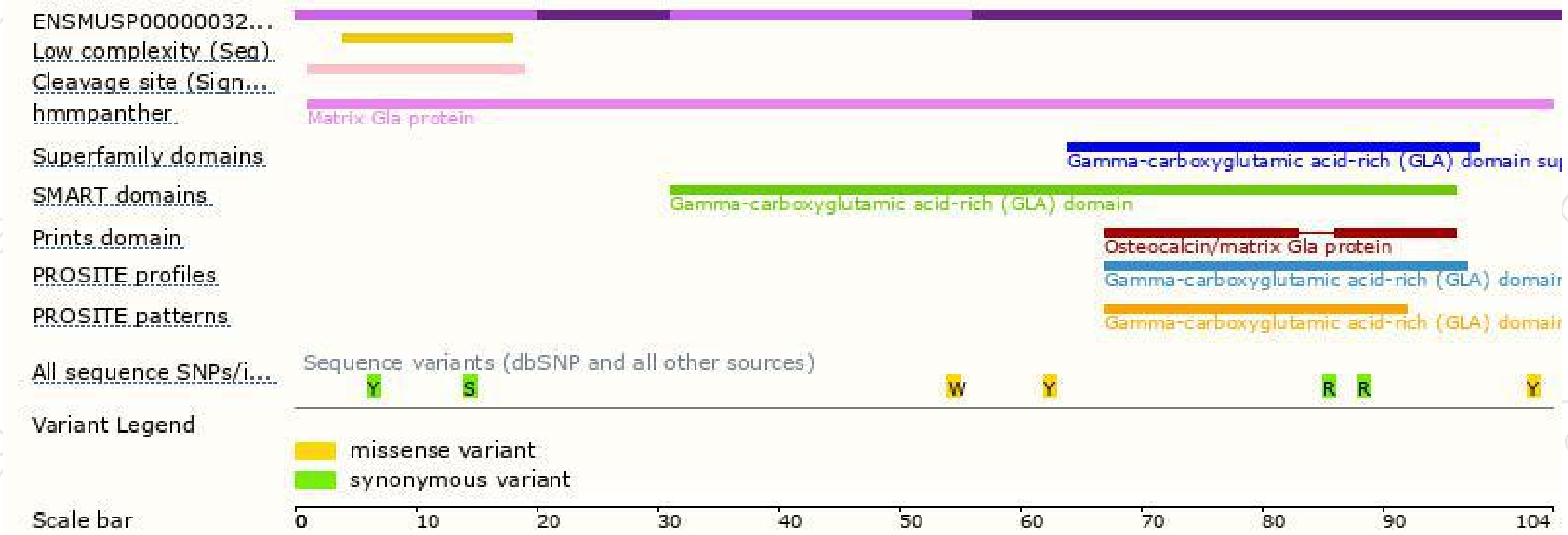
The strategy is based on the design of *Mgp-201* transcript,The transcription is shown below



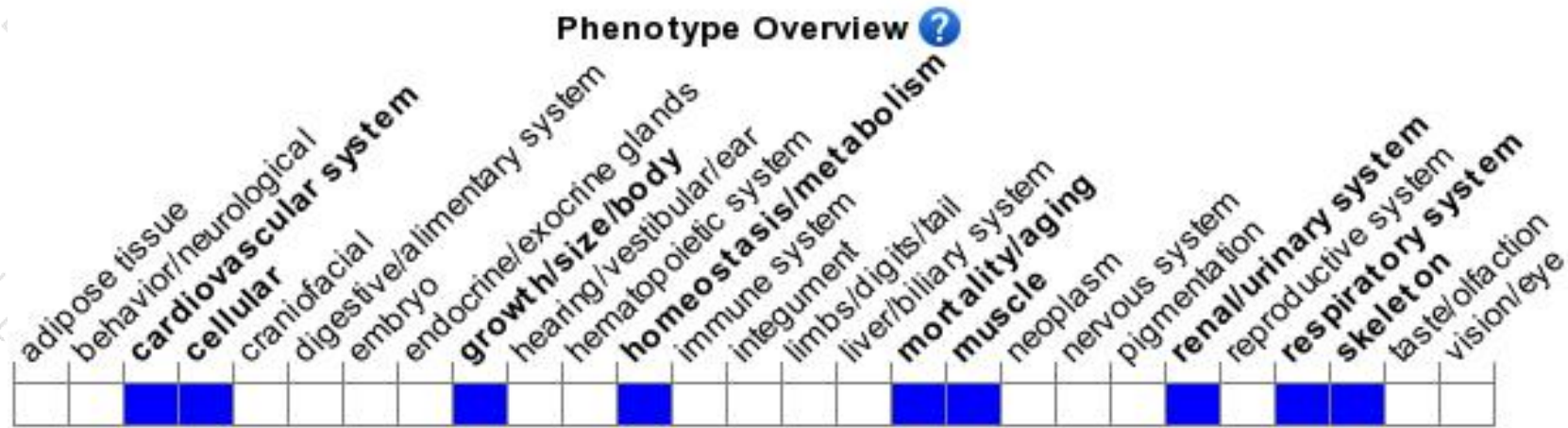
Genomic location distribution



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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