Usp10 Cas9-KO *Strategy*

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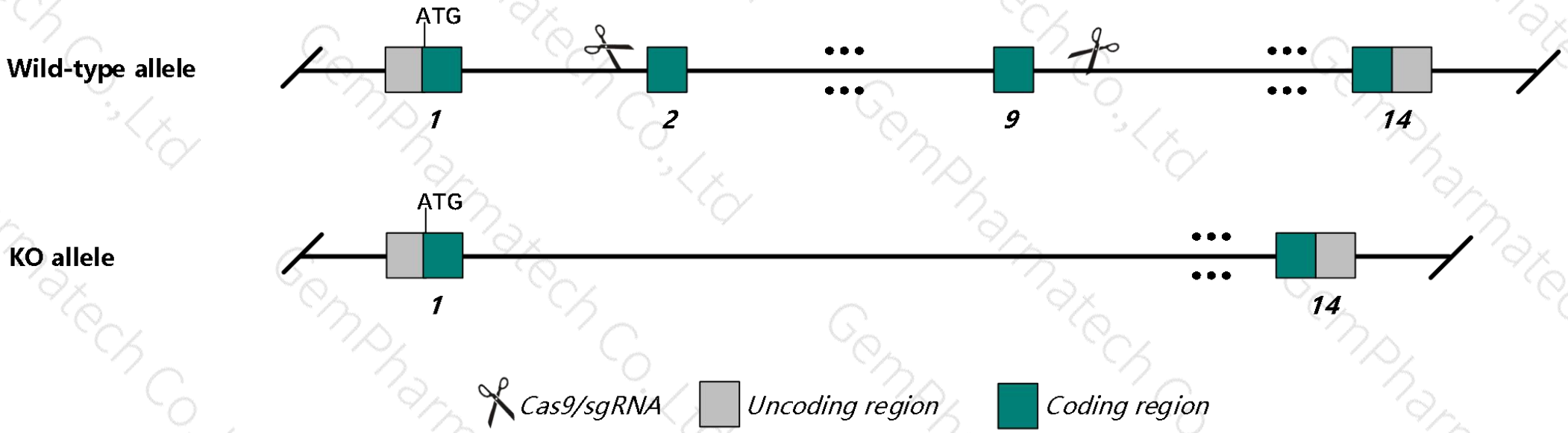
Design Date: 2020-4-17

Project Overview

Project Name	***Usp10***
Project type	**Cas9-KO**
Strain background	**C57BL/6J**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Usp10* gene. The schematic diagram is as follows:



Technical routes

- The *Usp10* gene has 13 transcripts.According to the structure of *Usp10* gene, exon2-exon9 of *Usp10*-210 (ENSMUST00000144458.7) transcript is recommended as the knockout region.The region contains 1618bp coding sequence.Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Usp10* gene. The brief process is as follows: sgRNA was transcribed in vitro.Cas9, 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 inactivation of this gene leads to alterations in arsenite-induced stress granule formation, reactive oxygen species (ROS) production, and ROS-dependent apoptosis in mouse embryonic fibroblasts.
- Transcript *Usp10-204* may not be affected.
- The KO region contains partial intron of the *Gm20388* gene.Knockout the region may affect the function of *Gm20388* gene.
- The *Usp10* gene is located on the Chr8. 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)

集萃药康 GemPharmatech

Usp10 ubiquitin specific peptidase 10 [*Mus musculus* (house mouse)]

Gene ID: 22224, updated on 16-Sep-2018

Summary

Official Symbol	Usp10 provided by MGI
Official Full Name	ubiquitin specific peptidase 10 provided by MGI
Primary source	MGI:MGI:894652
See related	Ensembl:ENSMUSG00000031826 Vega:OTTMUSG00000026199
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	UBPO; Uchrp; mKIAA0190; 2610014N07Rik
Expression	Ubiquitous expression in CNS E11.5 (RPKM 13.5), limb E14.5 (RPKM 11.2) and 28 other tissues See more
Orthologs	human all

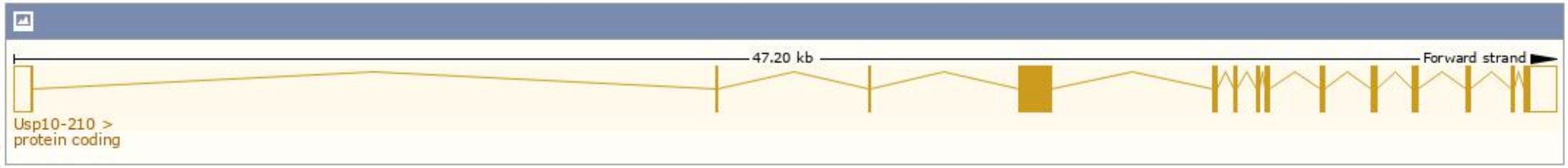
Transcript information （Ensembl）

The gene has 13 transcripts, and all transcripts are shown below:

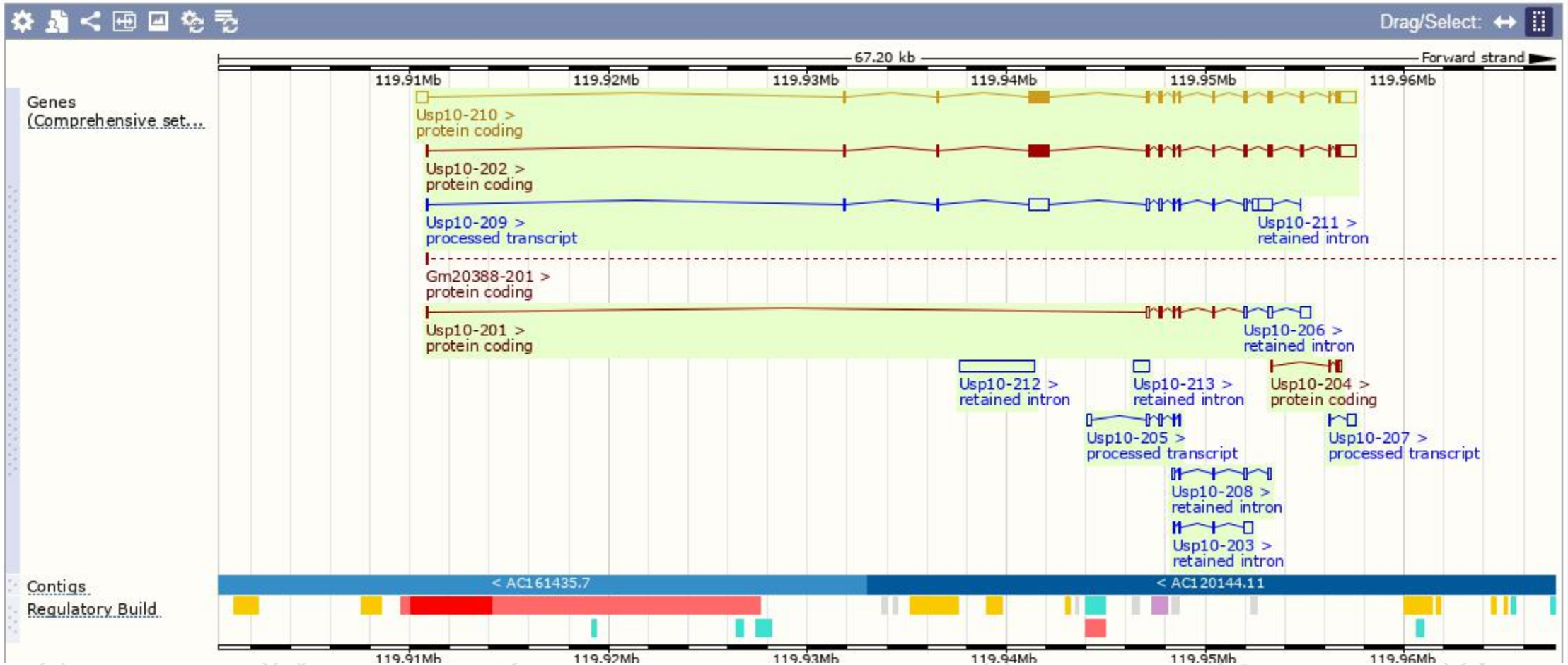
Show/hide columns (1 hidden) Filter

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	RefSeq	Flags
Usp10-210	ENSMUST00000144458.7	3726	793aa	Protein coding	CCDS40495	P52479	NM_009462 NP_033488	TSL:1 GENCODE basic APPRIS P3
Usp10-202	ENSMUST00000108988.8	3274	792aa	Protein coding	CCDS80938	P52479	NM_001310630 NP_001297559	TSL:1 GENCODE basic APPRIS ALT2
Usp10-201	ENSMUST00000108982.10	559	114aa	Protein coding	-	G3X9U6	-	CDS 3' incomplete TSL:5
Usp10-204	ENSMUST00000134729.1	424	88aa	Protein coding	-	G3UYQ8	-	CDS 5' incomplete TSL:3
Usp10-209	ENSMUST00000143615.7	2129	No protein	Processed transcript	-	-	-	TSL:1
Usp10-205	ENSMUST00000135210.1	467	No protein	Processed transcript	-	-	-	TSL:5
Usp10-207	ENSMUST00000139648.1	459	No protein	Processed transcript	-	-	-	TSL:5
Usp10-212	ENSMUST00000211935.1	3723	No protein	Retained intron	-	-	-	TSL:NA
Usp10-206	ENSMUST00000137310.1	831	No protein	Retained intron	-	-	-	TSL:2
Usp10-213	ENSMUST00000212612.1	761	No protein	Retained intron	-	-	-	TSL:NA
Usp10-203	ENSMUST00000125066.1	747	No protein	Retained intron	-	-	-	TSL:3
Usp10-211	ENSMUST00000148767.1	717	No protein	Retained intron	-	-	-	TSL:3
Usp10-208	ENSMUST00000142432.7	665	No protein	Retained intron	-	-	-	TSL:2

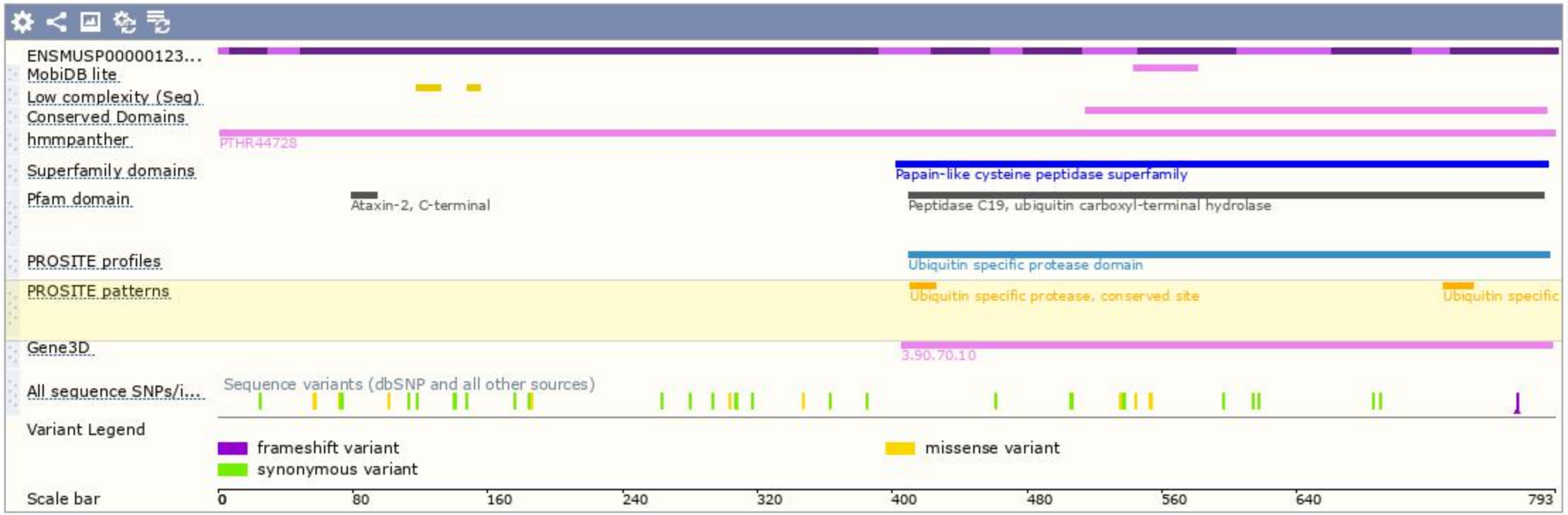
The strategy is based on the design of *Usp10*-210 transcript,The transcription is shown below



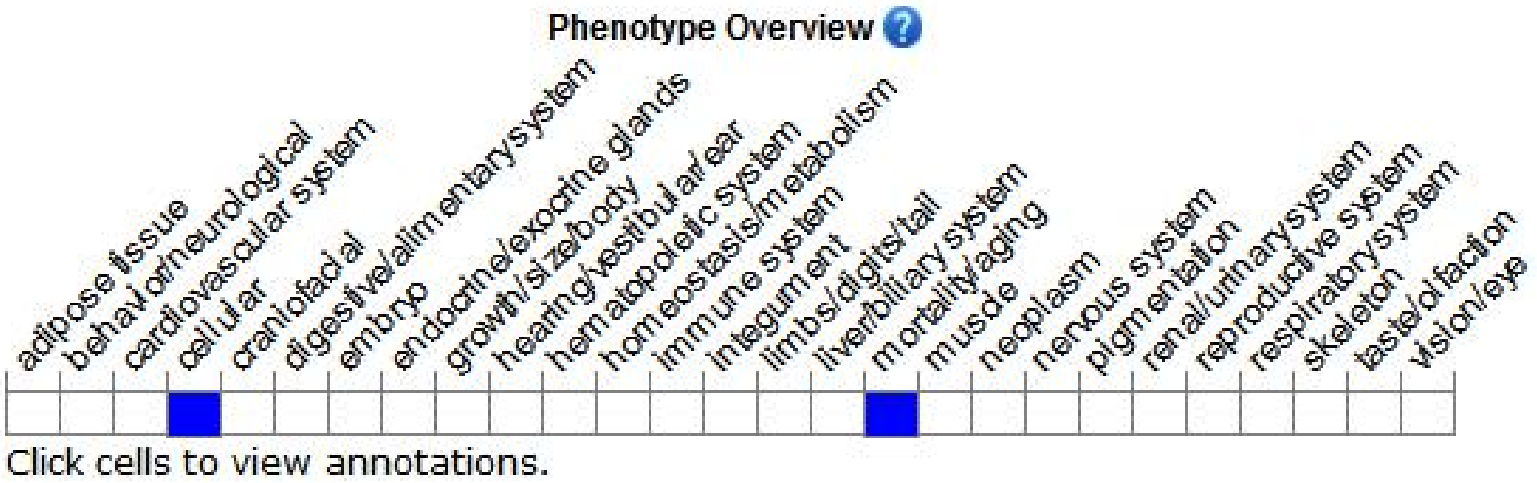
Genomic location distribution



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 inactivation of this gene leads to alterations in arsenite-induced stress granule formation, reactive oxygen species (ROS) production, and ROS-dependent apoptosis in mouse embryonic fibroblasts.

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

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