Prex1 Cas9-CKO Strategy

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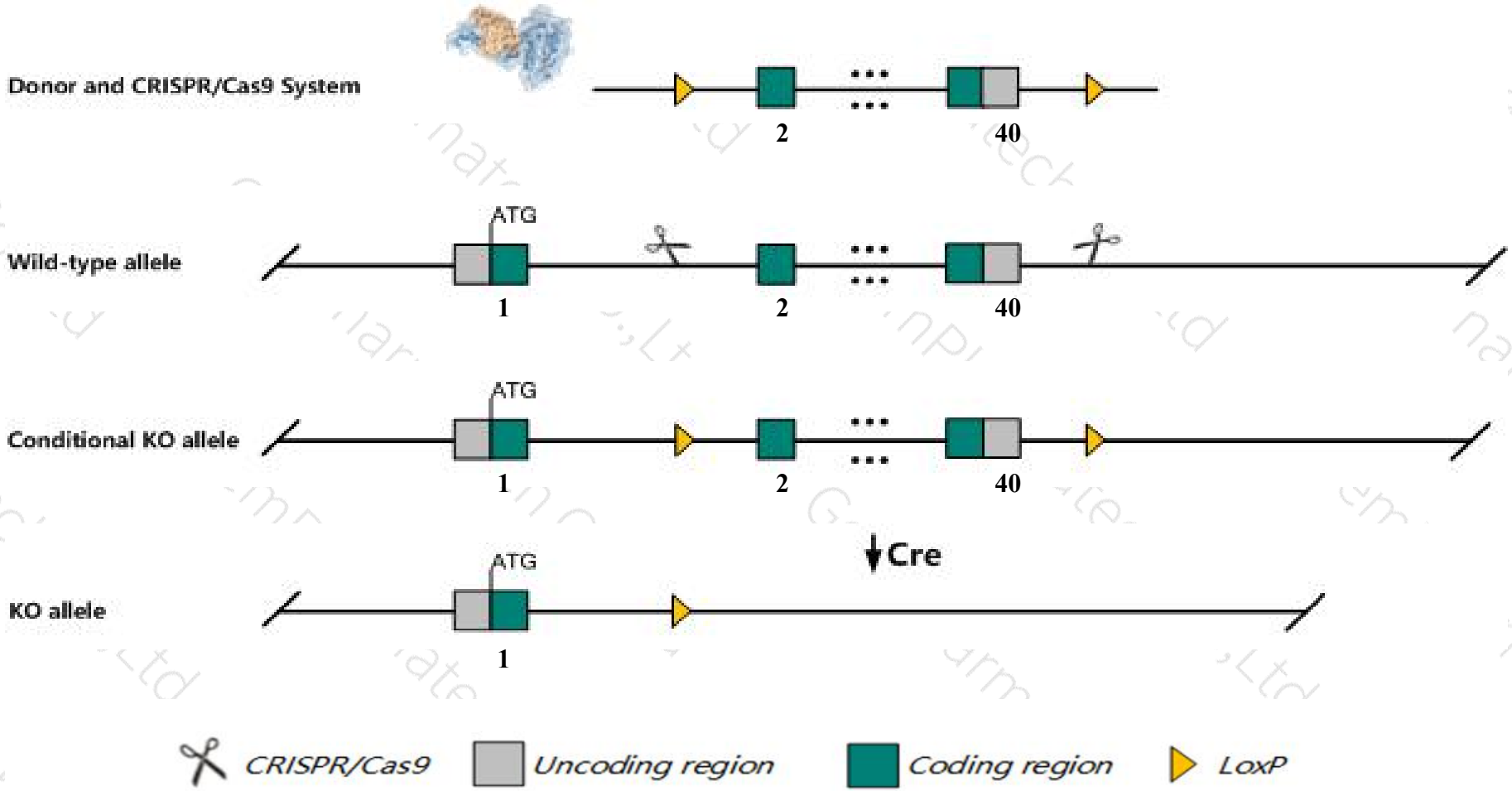
Project Overview

Project Name	***Prex1***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Prex1* gene. The schematic diagram is as follows:



Technical routes

- The *Prex1* gene has 8 transcripts. According to the structure of *Prex1* gene, exon2-exon40 of *Prex1-201* (ENSMUST00000036719.11) transcript is recommended as the knockout region.The region contains most of the coding sequence.Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Prex1* 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

➢ According to the existing MGI data,Mice homozygous for a null allele have impaired neutrophil migration and autism-like social behavior with defective AMPA-mediated LTD. Mice with other alleles exhibit reduced weight, smaller livers and increased peripheral neutrophil numbers.

➢ The *Prex1* gene is located on the Chr2. 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）

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Prex1 phosphatidylinositol-3,4,5-trisphosphate-dependent Rac exchange factor 1 [Mus musculus (house mouse)]

Gene ID: 277360, updated on 31-Jan-2019

Summary

Official Symbol	Prex1 provided by MGI
Official Full Name	phosphatidylinositol-3,4,5-trisphosphate-dependent Rac exchange factor 1 provided by MGI
Primary source	MGI:MGI:3040696
See related	Ensembl:ENSMUSG00000039621
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	G630042G04, P-REX1, Setd6
Expression	Broad expression in thymus adult (RPKM 69.0), spleen adult (RPKM 46.4) and 25 other tissues See more
Orthologs	human all

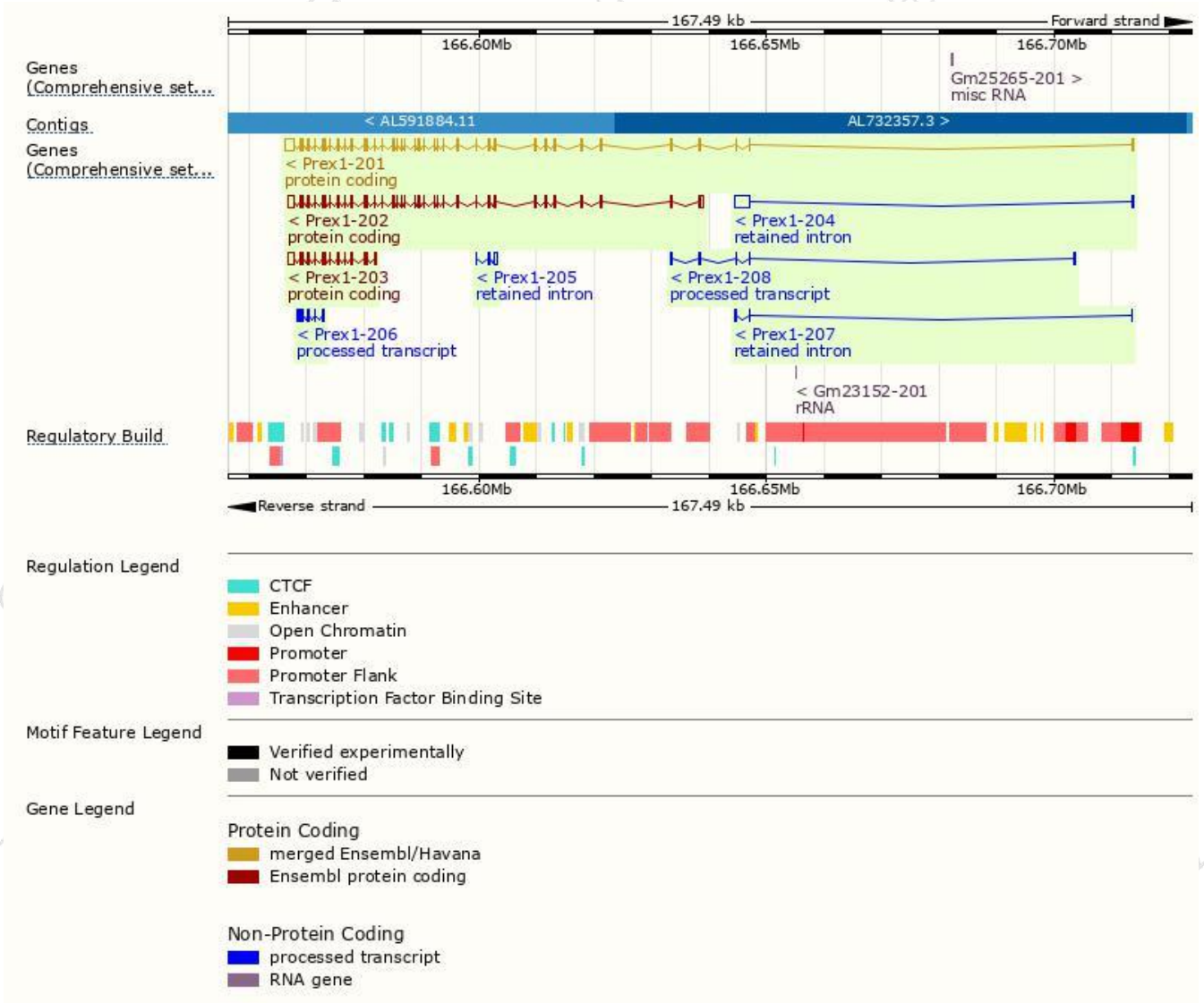
Transcript information（Ensembl）

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

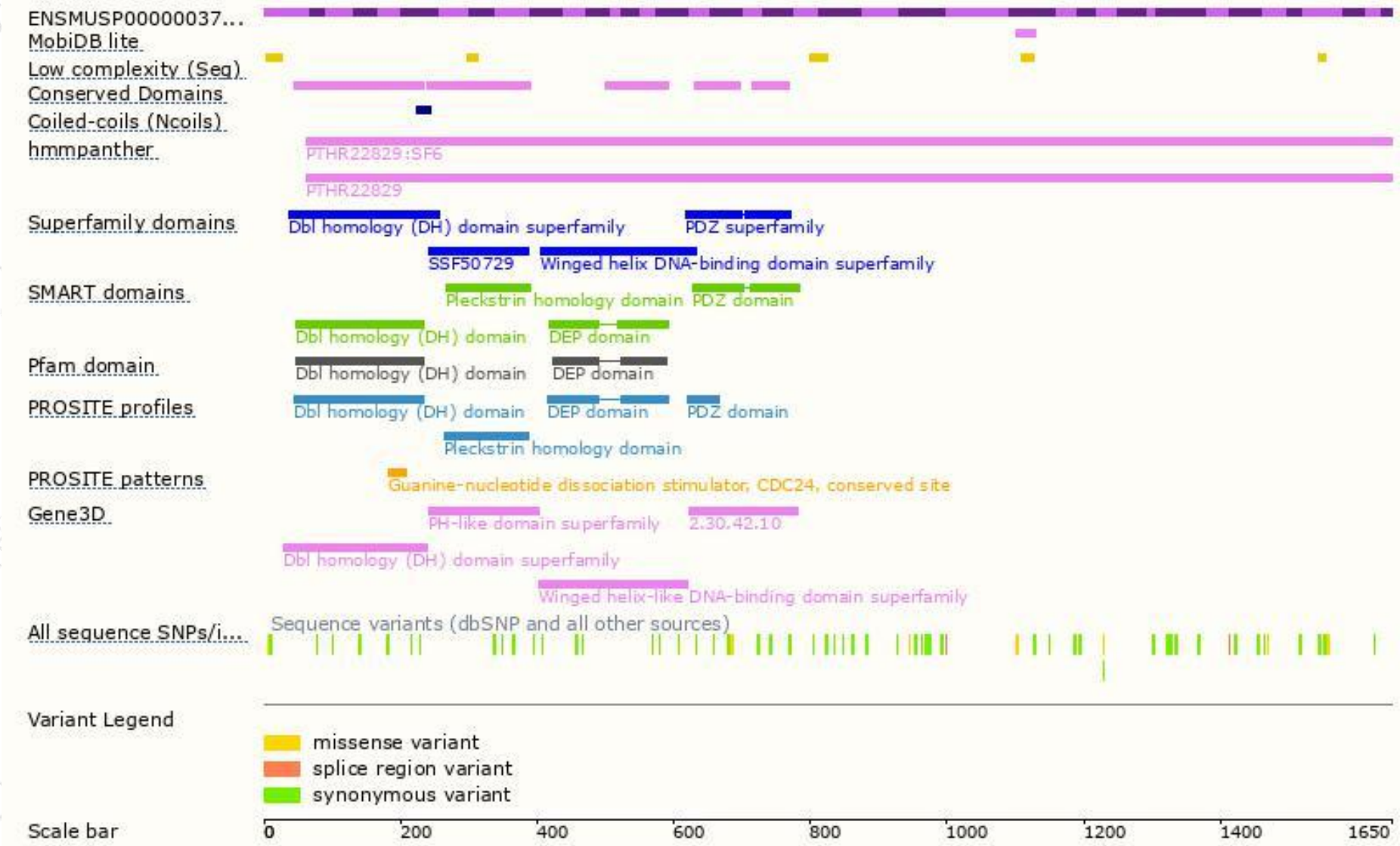
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Prex1-201	ENSMUST00000036719.11	6533	1650aa	Protein coding	CCDS38334	Q69ZK0	TSL:1 GENCODE basic APPRIS P1
Prex1-202	ENSMUST00000099080.8	5818	1480aa	Protein coding	-	I7HPV9	TSL:1 GENCODE basic
Prex1-203	ENSMUST00000109246.1	2386	462aa	Protein coding	-	Q69ZK0	TSL:1 GENCODE basic
Prex1-206	ENSMUST00000136974.1	929	No protein	Processed transcript	-	-	TSL:3
Prex1-208	ENSMUST00000152238.7	467	No protein	Processed transcript	-	-	TSL:3
Prex1-204	ENSMUST00000127553.1	2941	No protein	Retained intron	-	-	TSL:1
Prex1-207	ENSMUST00000140624.1	437	No protein	Retained intron	-	-	TSL:2
Prex1-205	ENSMUST00000136564.1	430	No protein	Retained intron	-	-	TSL:5

The strategy is based on the design of *Prex1-201* transcript,The transcription is shown below

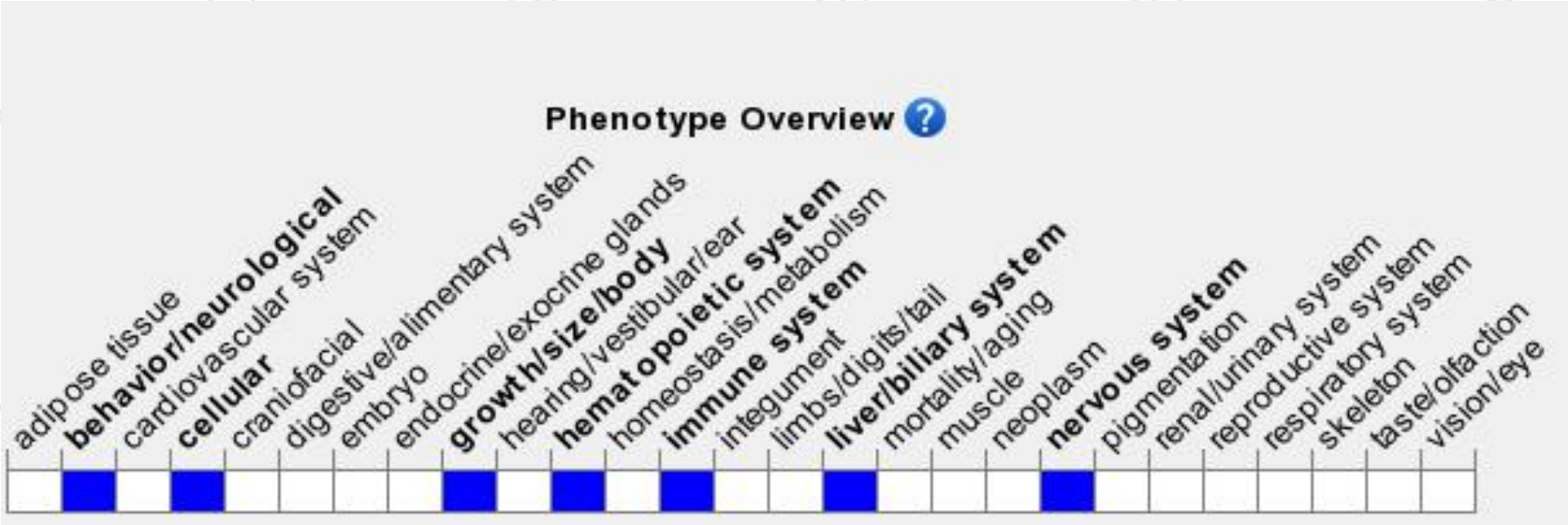
Genomic location distribution



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,Mice homozygous for a null allele have impaired neutrophil migration and autism-like social behavior with defective AMPA-mediated LTD. Mice with other alleles exhibit reduced weight, smaller livers and increased peripheral neutrophil numbers.

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

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