Xpo1 Cas9-CKO *Strategy*

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Project Overview

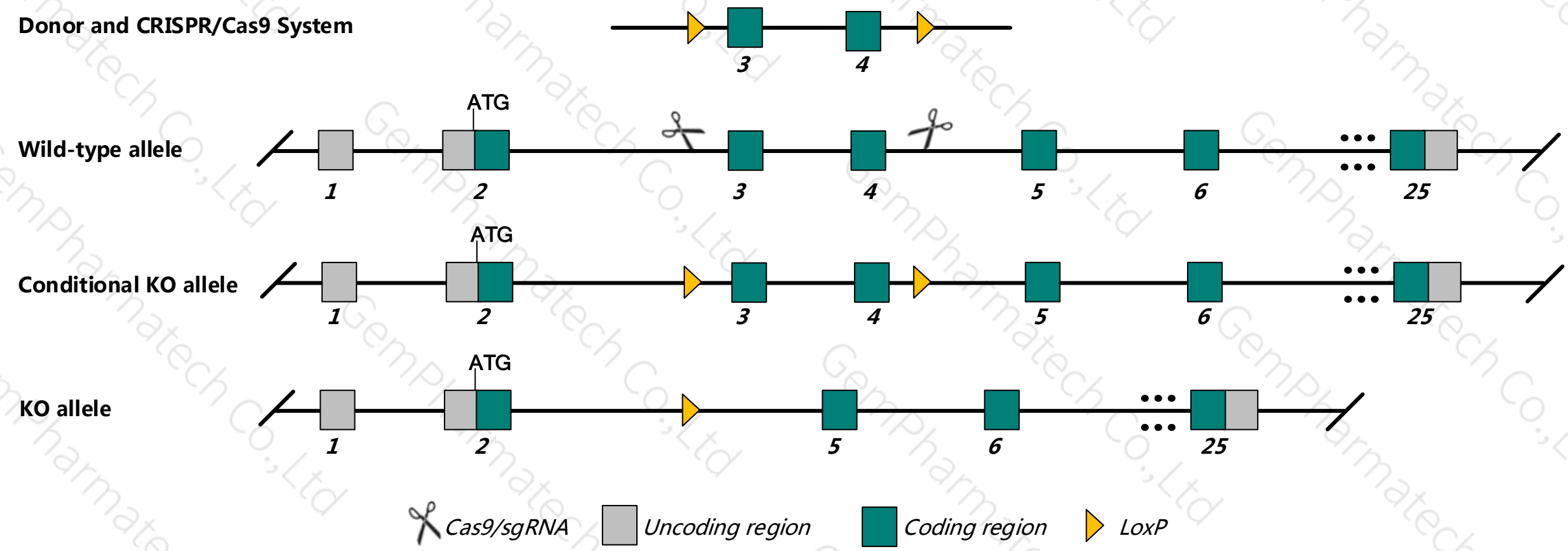|	
Project Name	*Xpo1*
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Xpo1* gene. The schematic diagram is as follows:

Technical routes

➢ The *Xpo1* gene has 7 transcripts.According to the structure of *Xpo1* gene, exon3~exon4 of *Xpo1*-202 (ENSMUST00000102869.7) transcript is recommended as the knockout region.The region contains 175bp coding sequence.Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Xpo1* gene. The brief process is as follows: sgRNA was transcribed in vitro, donor vector was constructed.Cas9, sgRNA 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 was knocked out after mating with mice expressing Cre recombinase, resulting in the loss of function of the target gene in specific tissues or cell types.

Notice

- According to the existing MGI data，null homozygotes show complete prenatal lethality prior to heart atrial septation.

- Transcript *Xpo1-207* may not be affected.

- The *Xpo1* gene is located on the Chr11. 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

Gene information （NCBI）

Xpo1   exportin 1 [*Mus musculus* (house mouse)]

Gene ID: 103573, updated on 13-Mar-2020

▲ Summary

|	
Official Symbol	Xpo1 provided by MGI
Official Full Name	exportin 1 provided by MGI
Primary source	MGI:MGI:2144013
See related	Ensembl:ENSMUSG00000020290
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	Crm1; Exp1; AA420417
Expression	Broad expression in CNS E11.5 (RPKM 31.7), limb E14.5 (RPKM 25.4) and 23 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

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

| Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Xpo1-202	ENSMUST00000102869.7	6004	1071aa	Protein coding	CCDS24475	Q6P5F9	TSL:1 GENCODE basic APPRIS P1
Xpo1-201	ENSMUST00000020538.12	5145	1071aa	Protein coding	CCDS24475	Q6P5F9	TSL:5 GENCODE basic APPRIS P1
Xpo1-204	ENSMUST00000109551.7	4906	1071aa	Protein coding	CCDS24475	Q6P5F9	TSL:1 GENCODE basic APPRIS P1
Xpo1-203	ENSMUST00000102870.7	3471	1071aa	Protein coding	CCDS24475	Q6P5F9	TSL:5 GENCODE basic APPRIS P1
Xpo1-207	ENSMUST00000150750.2	698	233aa	Protein coding	-	F6YA11	CDS 5' and 3' incomplete TSL:5
Xpo1-205	ENSMUST00000136235.1	463	59aa	Protein coding	-	A2AKT6	CDS 3' incomplete TSL:3
Xpo1-206	ENSMUST00000149371.1	2902	No protein	Processed transcript	-	-	TSL:5

The strategy is based on the design of *Xpo1-202* transcript,the transcription is shown below:
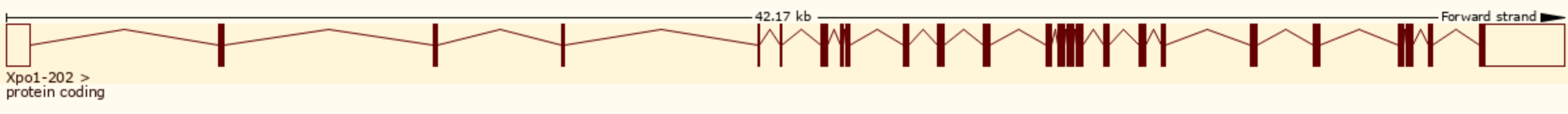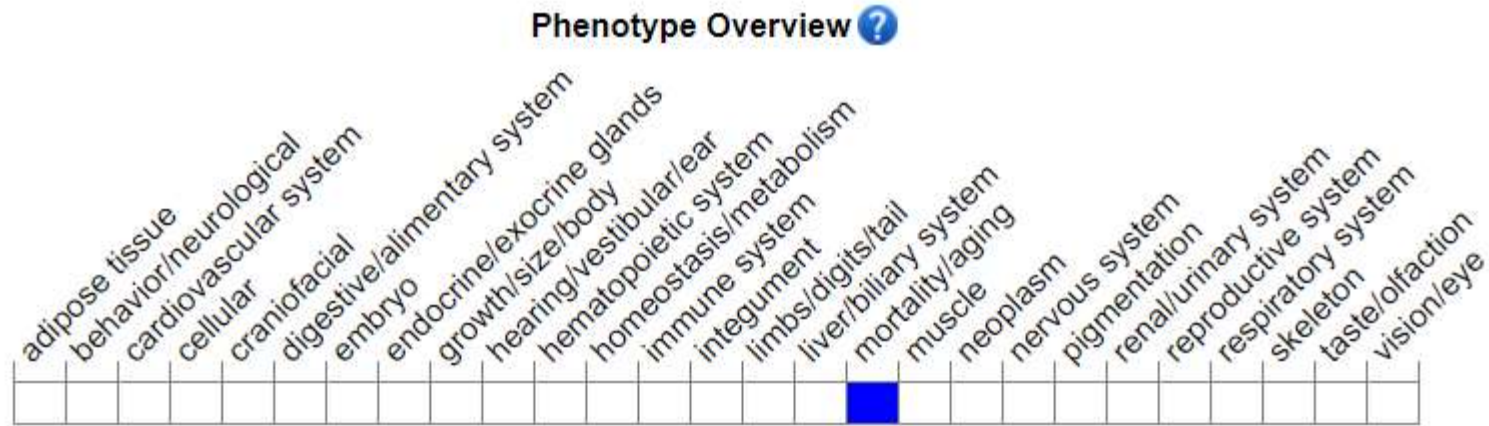
Genomic location distribution
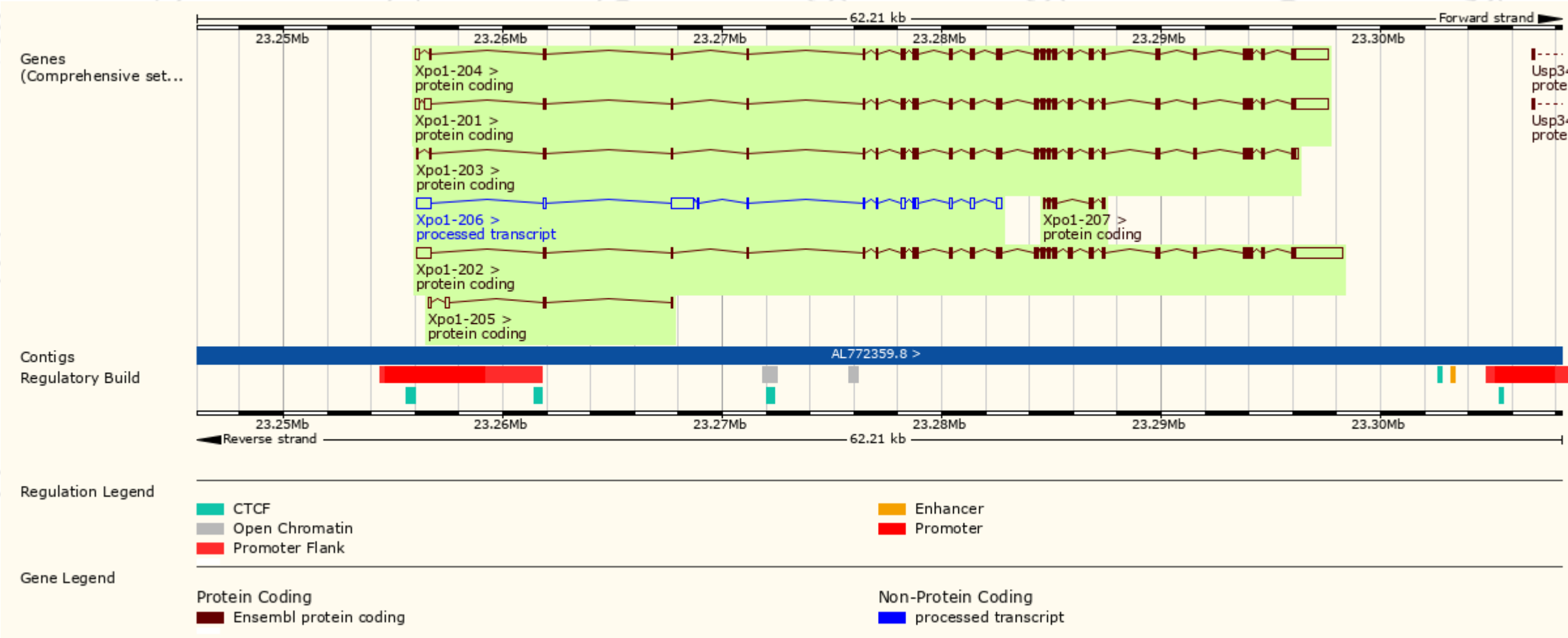
Protein domain
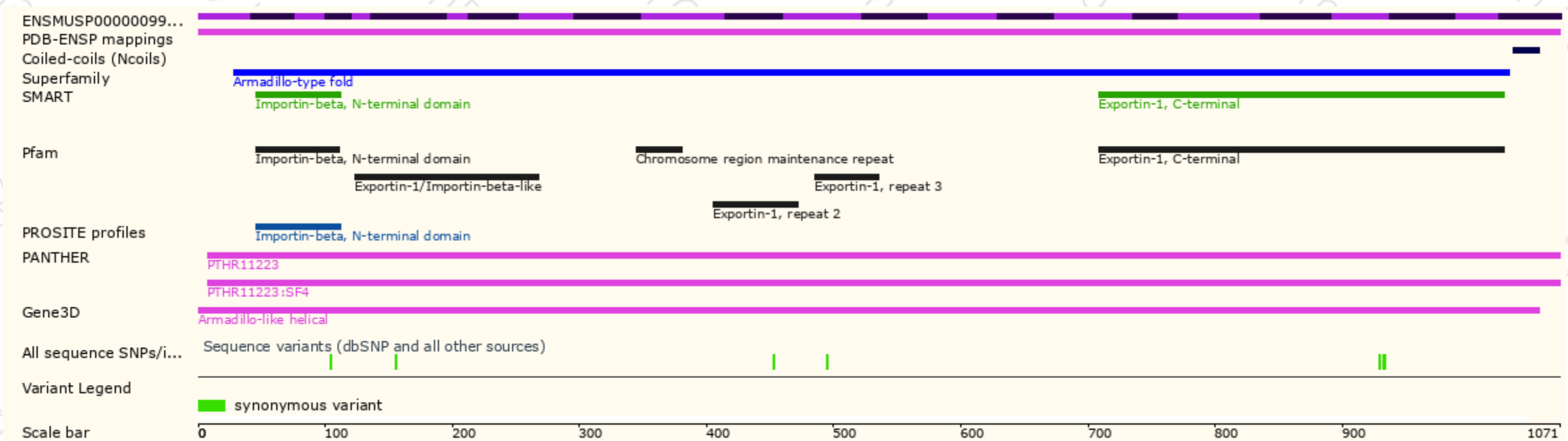
Mouse phenotype description(MGI)

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, null homozygotes show complete prenatal lethality prior to heart atrial septation.

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