Rfx3 Cas9-KO Strategy

Designer: Daohua Xu

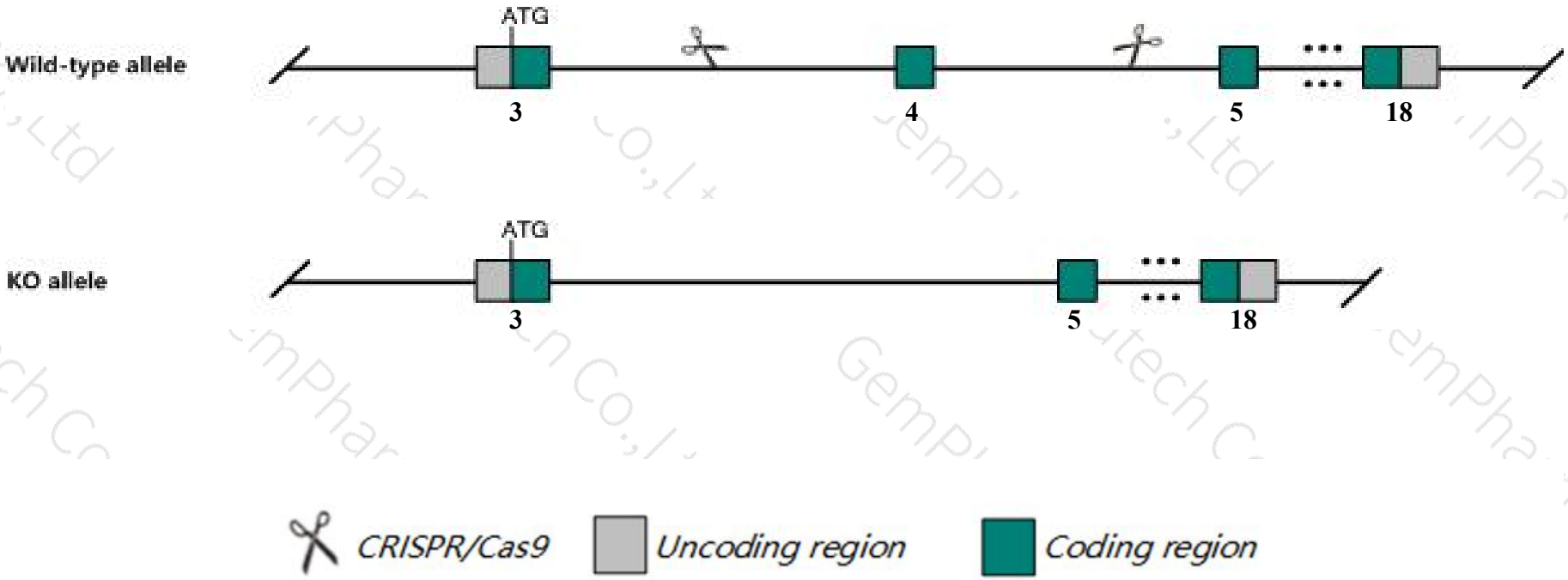
Design Date: 2019-7-30

Project Overview

Project Name	***Rfx3***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Rfx3* gene. The schematic diagram is as follows:



Technical routes

➢ The *Rfx3* gene has 8 transcripts. According to the structure of *Rfx3* gene, exon4 of *Rfx3-202* (ENSMUST00000165566.7) transcript is recommended as the knockout region.The region contains 98bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Rfx3* gene. The brief process is as follows: CRISPR/Cas9 system w

Notice

➢ According to the existing MGI data,Homozygous null mice display embryonic and perinatal lethality, impaired development of cilia on the embryonic node, abnormal left-right patterning, meso- and dextrocardia, and situs inversus in surviving adults.

➢ The *Rfx3* gene is located on the Chr19. 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）

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Rfx3 regulatory factor X, 3 (influences HLA class II expression) [Mus musculus (house mouse)]

Gene ID: 19726, updated on 31-Jan-2019

Summary

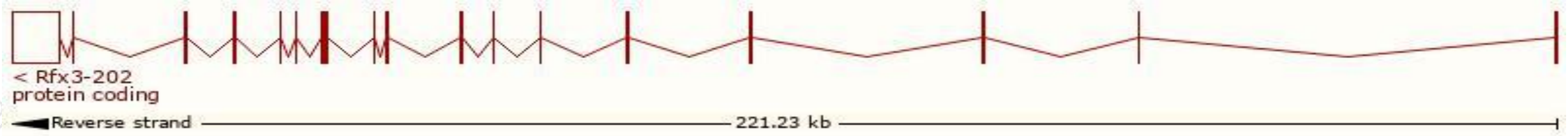
Official Symbol	Rfx3 provided by MGI
Official Full Name	regulatory factor X, 3 (influences HLA class II expression) provided by MGI
Primary source	MGI:MGI:106582
See related	Ensembl:ENSMUSG00000040929
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	C230093O12Rik, MRFX3
Expression	Broad expression in CNS E18 (RPKM 4.6), whole brain E14.5 (RPKM 4.4) and 22 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

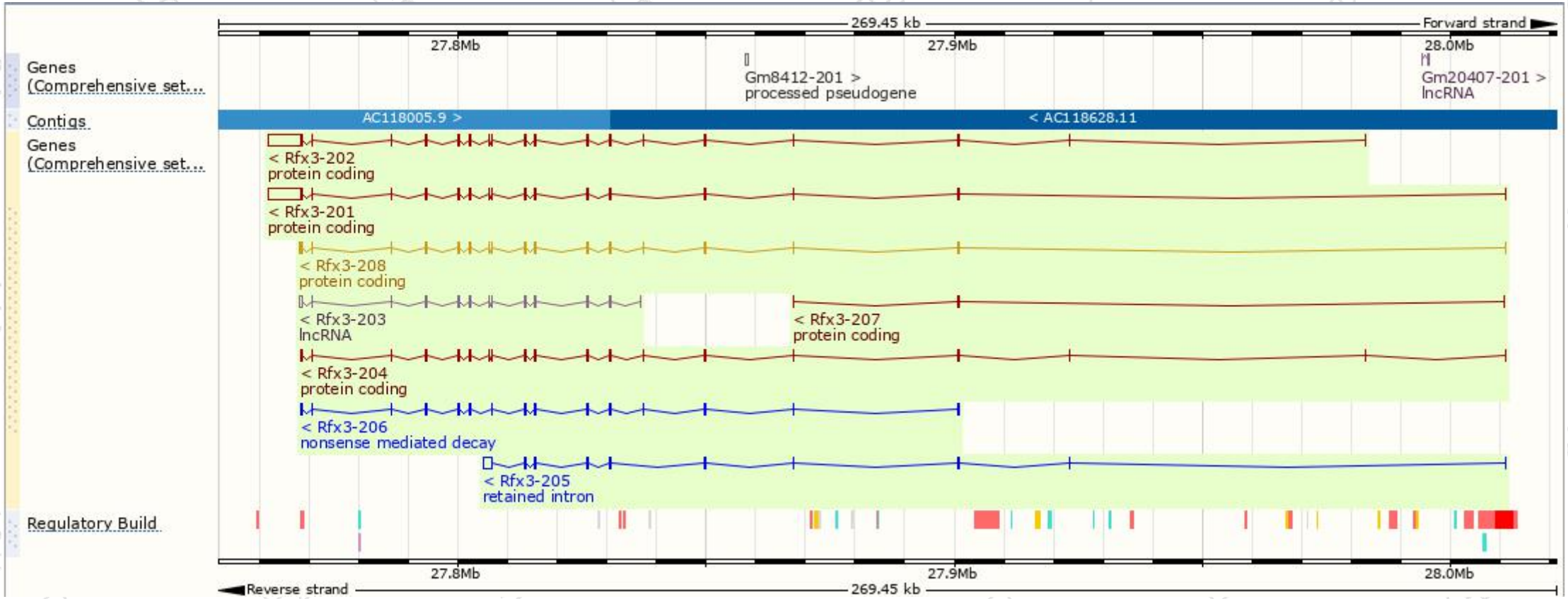
The gene has 8 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Rfx3-202	ENSMUST00000165566.7	9146	749aa	Protein coding	CCDS29725	P48381	TSL:5 GENCODE basic APPRIS P1
Rfx3-208	ENSMUST00000174850.7	2743	749aa	Protein coding	CCDS29725	P48381	TSL:1 GENCODE basic APPRIS P1
Rfx3-204	ENSMUST00000172907.7	2621	749aa	Protein coding	CCDS29725	P48381	TSL:1 GENCODE basic APPRIS P1
Rfx3-201	ENSMUST00000046898.16	8988	724aa	Protein coding	-	G5E890	TSL:1 GENCODE basic
Rfx3-207	ENSMUST00000174420.1	343	71aa	Protein coding	-	G3UZZ6	CDS 3' incomplete TSL:2
Rfx3-206	ENSMUST00000173863.1	2053	458aa	Nonsense mediated decay	-	G3UWP0	TSL:5
Rfx3-205	ENSMUST00000173161.1	3039	No protein	Retained intron	-	-	TSL:1
Rfx3-203	ENSMUST00000172498.7	2091	No protein	lncRNA	-	-	TSL:2

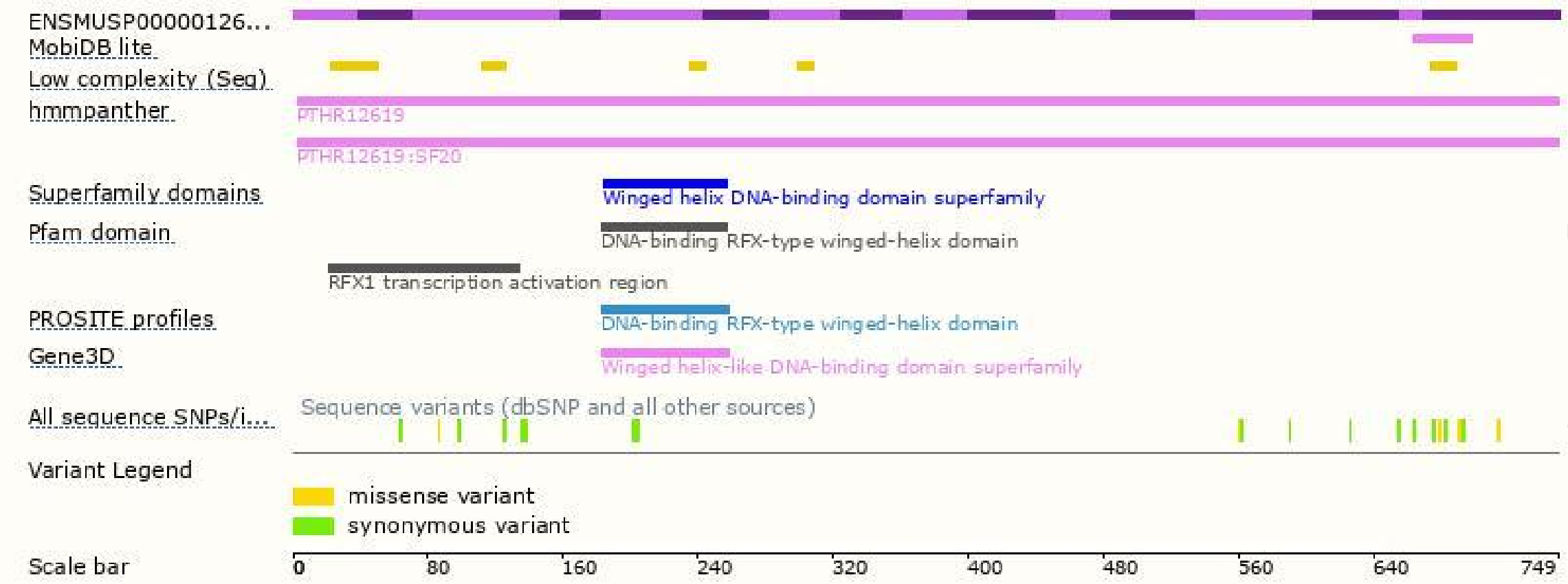
The strategy is based on the design of *Rfx3-202* transcript,The transcription is shown below



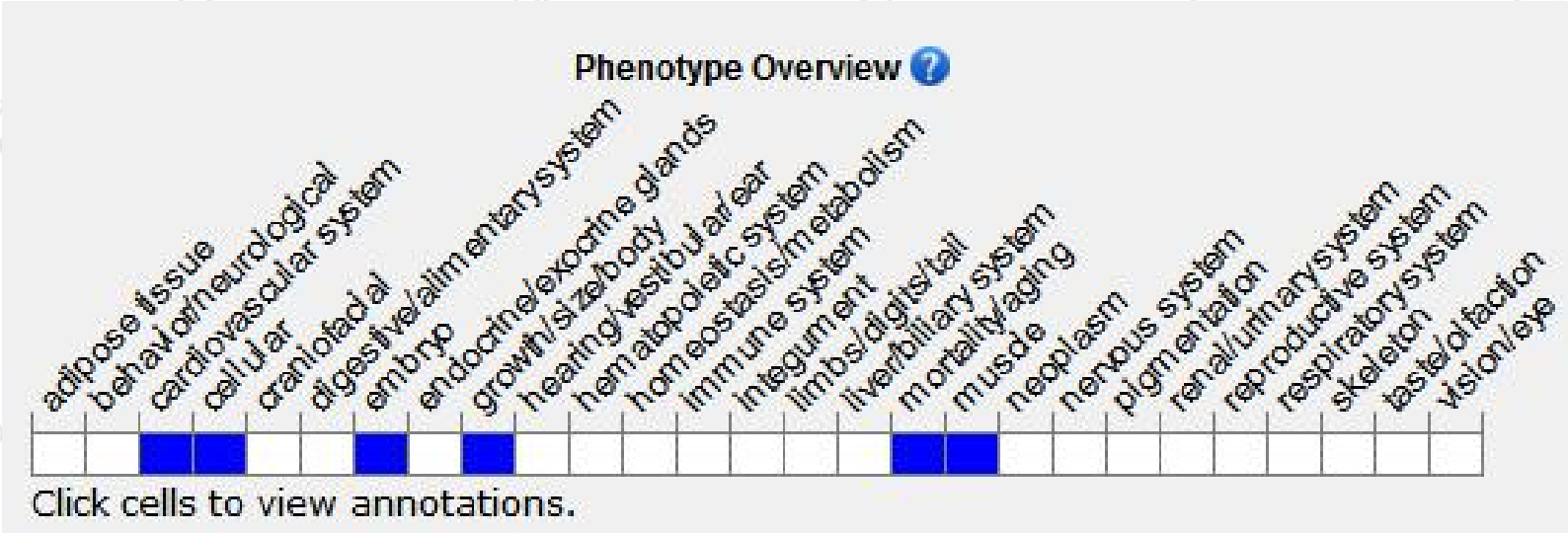
Genomic location distribution



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,Homozygous null mice display embryonic and perinatal lethality, impaired development of cilia on the embryonic node, abnormal left-right patterning, meso- and dextrocardia, and situs inversus in surviving adults.

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

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