

Il4ra Cas9-CKO Strategy

Designer: Xiaojing Li

Design Date: 2019-8-15

Project Overview

Project Name

Il4ra

Project type

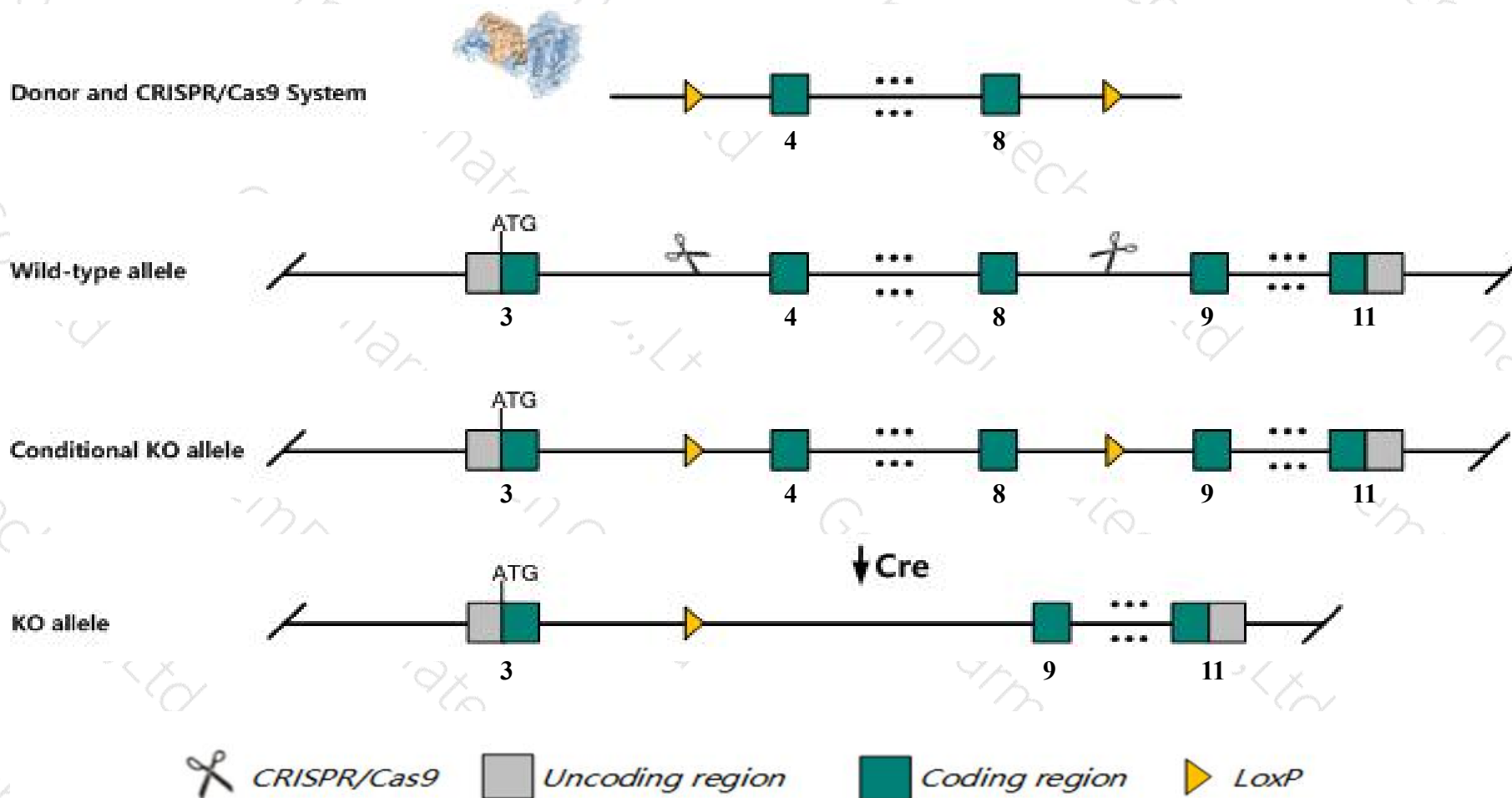
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Il4ra* gene. The schematic diagram is as follows:



- The *Il4ra* gene has 5 transcripts. According to the structure of *Il4ra* gene, exon4-exon8 of *Il4ra-201* (ENSMUST00000033004.7) transcript is recommended as the knockout region. The region contains 703bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Il4ra* 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.

- According to the existing MGI data, Nullizygous mice exhibit reduced T helper 2 cell response to *N. brasiliensis* infection. Homozygotes for a null allele also display severe susceptibility to *S. mansoni* infection, enhanced carcinogen-induced intestinal tumour initiation, and altered control of chronic *Leishmania major* infection.
- The strategy knockout region contains Gm44876 lncRNA gene, which also destroys Gm44876 lncRNA gene.
- The *Il4ra* gene is located on the Chr7. 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)

Il4ra interleukin 4 receptor, alpha [Mus musculus (house mouse)]

Gene ID: 16190, updated on 12-Mar-2019

Summary



Official Symbol	Il4ra provided by MGI
Official Full Name	interleukin 4 receptor, alpha provided by MGI
Primary source	MGI:MGI:105367
See related	Ensembl:ENSMUSG00000030748
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	CD124, Il4r
Expression	Broad expression in thymus adult (RPKM 39.6), adrenal adult (RPKM 36.7) and 18 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

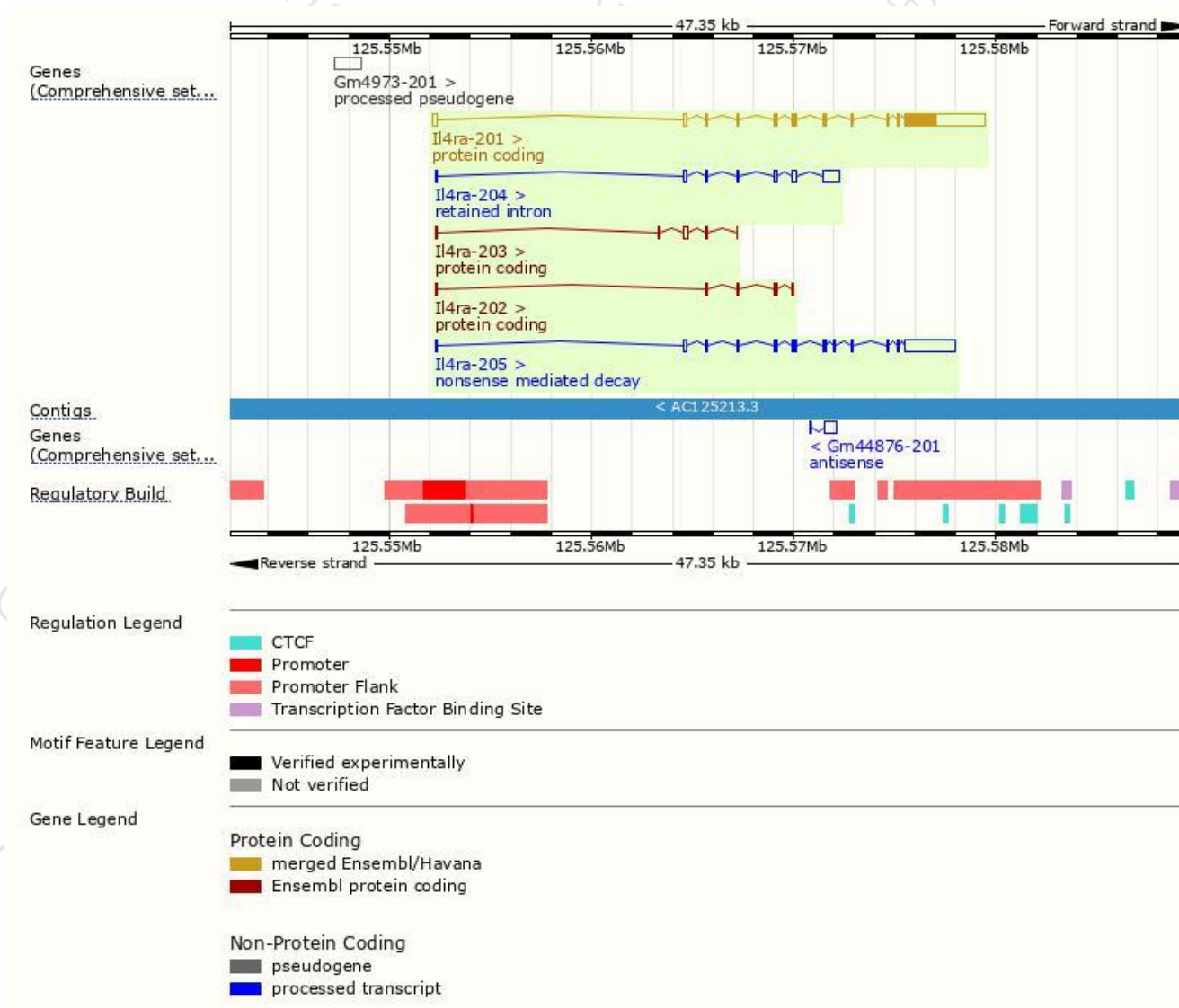
The gene has 5 transcripts, all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Il4ra-201	ENSMUST00000033004.7	5256	810aa	Protein coding	CCDS40121	P16382 Q3U905	TSL:1 GENCODE basic APPRIS P1
Il4ra-202	ENSMUST00000205985.1	491	140aa	Protein coding	-	A0A0U1RNW1	CDS 3' incomplete TSL:3
Il4ra-203	ENSMUST00000206217.1	434	42aa	Protein coding	-	A0A0U1RPZ6	CDS 3' incomplete TSL:2
Il4ra-205	ENSMUST00000206846.1	3696	230aa	Nonsense mediated decay	-	P16382	TSL:1
Il4ra-204	ENSMUST00000206681.1	1615	No protein	Retained intron	-	-	TSL:1

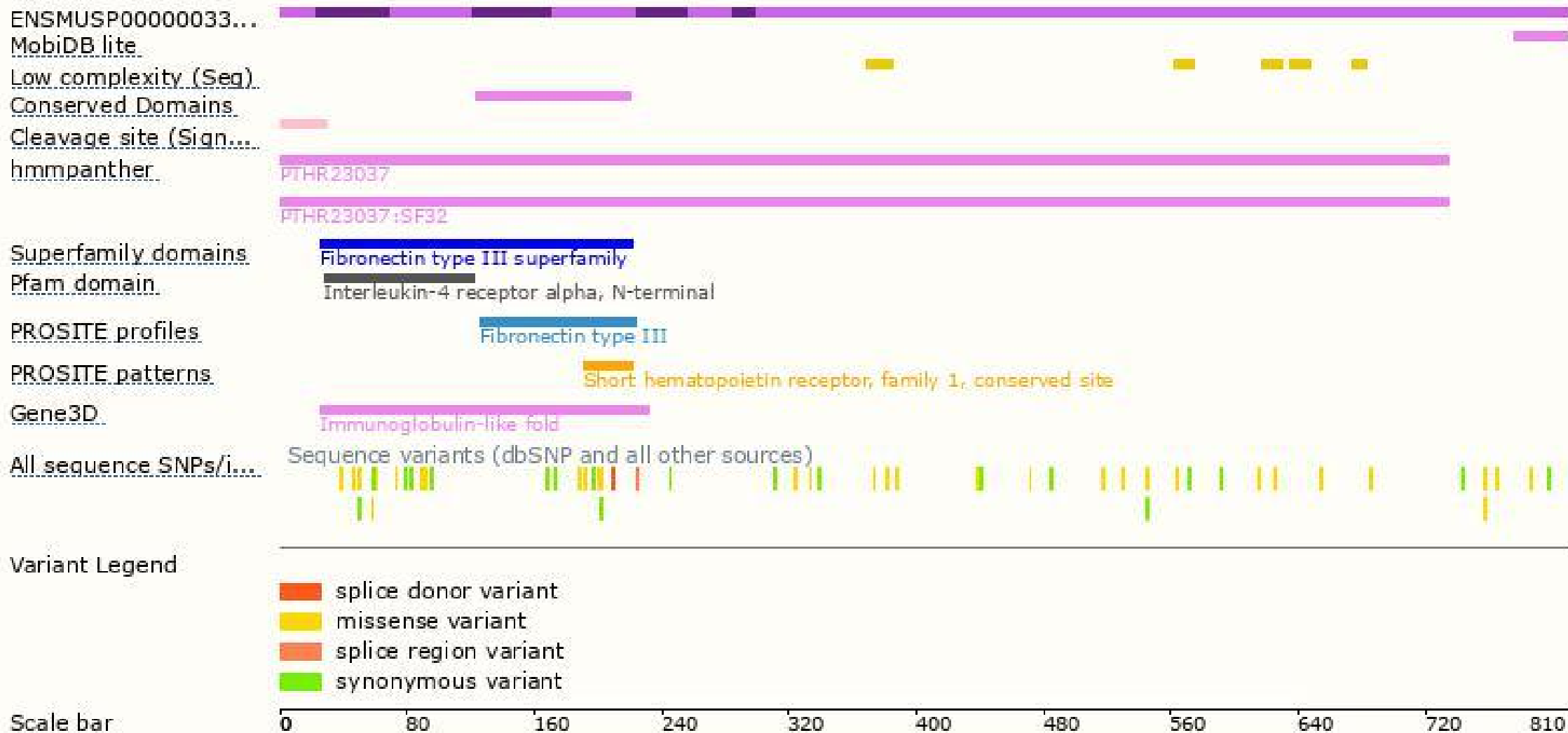
The strategy is based on the design of *Il4ra-201* transcript, The transcription is shown below



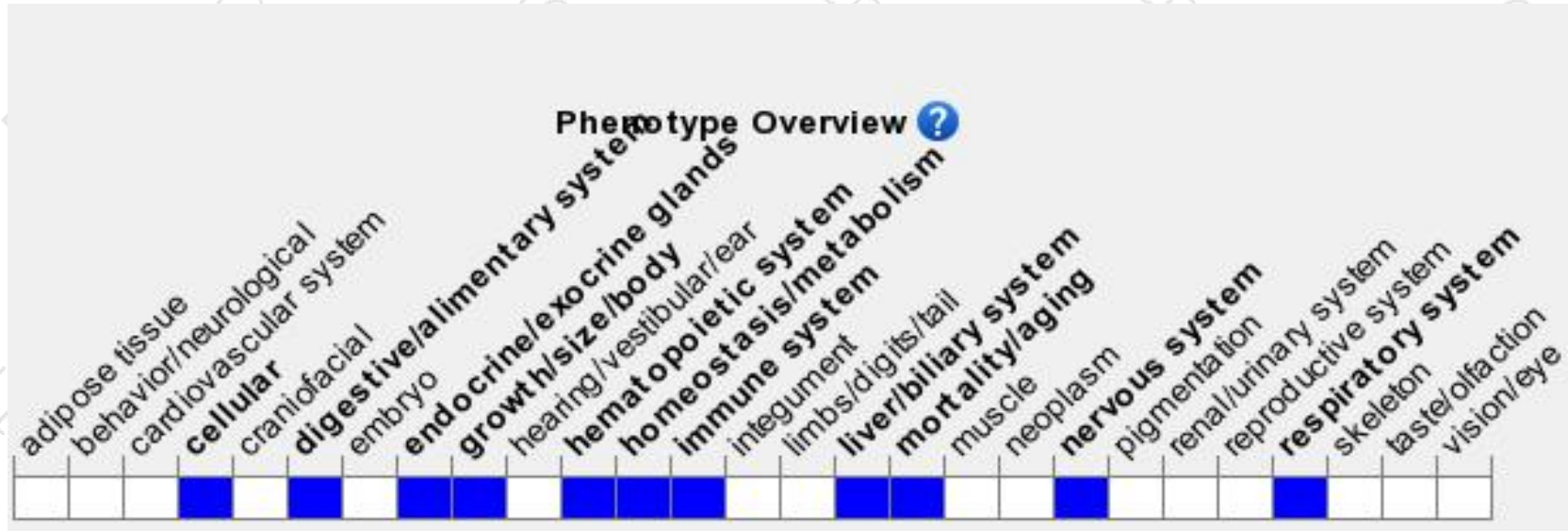
Genomic location distribution



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, Nullizygous mice exhibit reduced T helper 2 cell response to *N. brasiliensis* infection. Homozygotes for a null allele also display severe susceptibility to *S. mansoni* infection, enhanced carcinogen-induced intestinal tumour initiation, and altered control of chronic *Leishmania major* infection.

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

Tel: 400-9660890

