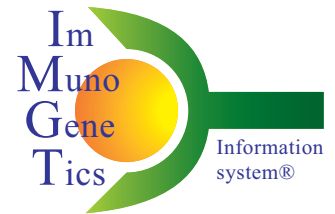# IMGT overview: the mouse T cell receptor gamma TRG genes

G. Folch, D. Scaviner, C. Ginestoux, V. Giudicelli and M.-P. Lefranc

IMGT the international ImMunoGeneTics information system®, LIGM, UM2, CNRS UPR1142, IGH
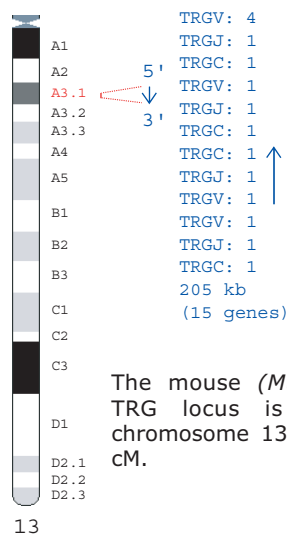141 rue de la Cardonille, 34396 Montpellier Cedex 05, France - lefranc@ligm.igh.cnrs.fr

Im MunoGeneTics Information system®

http://imgt.cines.fr

How many TRG genes?

Chromosome 13 A3.1

The total number of T cell receptor gamma TRG genes per haploid genome in *Mus musculus* laboratory mice is 15.

TRGV: 4
TRGJ: 1
TRGC: 1
5' TRGV: 1
TRGJ: 1
3' TRGC: 1
TRGC: 1
TRGJ: 1
TRGV: 1
TRGV: 1
TRGJ: 1
TRGC: 1
205 kb
(15 genes)

The mouse *(Mus musculus)* TRG locus is located on chromosome 13 A3.1 at 10.0 cM.

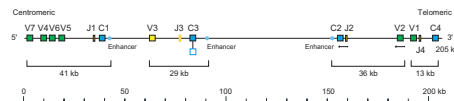*Lefranc, M.-P. et al., In Silico Biology, 5, 45-60 (2005)*

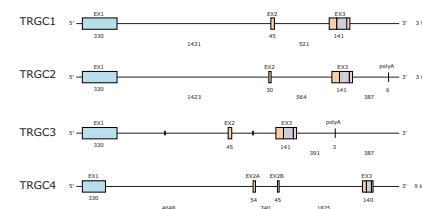## How are TRG genes organized?

TRG locus

The mouse TRG locus spans 200 kb and comprises 7 TRGV genes belonging to 5 subgroups, 4 TRGJ and 4 TRGC. The TRG locus is organized in four clusters
  ○ for the first one: 4 TRGV, 1TRGJ and 1 TRGC
  ○ for the others: 1 TRGV, 1 TRGJ and 1 TRGC.
The third cluster is in inverted orientation.

Gene exon/intron organization of the mouse TRGC genes

Lefranc, M.-P. et al., Nucl. Acids Res., 33, D593-D597 (2005)

How many functional TRG genes?

Potential repertoire

The potential TRG repertoire per haploid genome comprises 14 functional genes: 7 TRGV, 4 TRGJ and 3 TRGC.

Overview		
	Number of genes	Functional genes
TRGV	7	7
TRGJ	4	4
TRGC	4	3
Total	15	14

The definitive IMGT nomenclature of the mouse TRGV genes and the correspondence with the provisional nomenclature have been established.

The mouse TRG genes and alleles and the corresponding IMGT reference sequences were provided to Mouse Genome Informatics MGD in July 2002 and are available in IMGT/GENE-DB.

Giudicelli, V. et al., Nucl. Acids Res., 33, D256-D261 (2005)

IMGT tools to analyse expressed variable genes

IMGT/V-QUEST IMGT/JunctionAnalysis

Sequence analysis

Analysis of the TRGV genes (germline or rearranged) can be performed by IMGT/V-QUEST and analysis of the V-J junctions by IMGT/JunctionAnalysis.

Giudicelli, V. et al., Nucl. Acids Res., 32, W435-W440 (2004)
Yousfi Monod, M. et al., Bioinformatics, 20, I379-I385 (2004)

IMGT Colliers de Perles

2D representations

Mus musculus (Mouse) TRGV2-TRGJ2
CDR-IMGT lengths [8.6.12] M34971
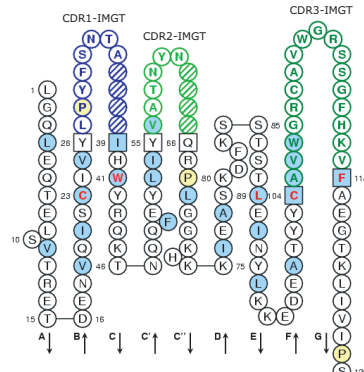
IMGT Colliers de Perles are according to the IMGT unique numbering for V-DOMAIN.

Lefranc, M.-P. et al., Dev. Comp. Immunol., 25, 55-77 (2003)
Lefranc, M.-P. et al., Dev. Comp. Immunol., 29, 185-203 (2005)

IMGT/3Dstructure-DB IMGT/Collier de perles tool

Towards 3D structures

There is no known three dimensional structure of V-GAMMA domain or TR GAMMA chain, but IMGT Colliers de Perles can be constructed with the tool available at the IMGT/3Dstructure-DB home page.
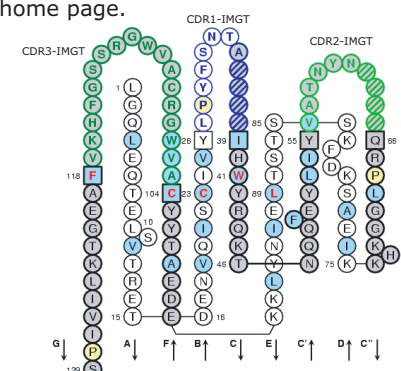
Kaas, Q. et al., Nucl. Acids Res., 32, D208-210 (2004)
Kaas, Q. and Lefranc, M.-P., In silico Biol., 5, 0046 (2005)