The immunoglobulin (IG) and T cell receptor (TR) major loci span about 6 Megabases (Mb) of the human genome on chromosomes 2, 7, 14 and 22. There are seven major loci: three IG loci (IGH, IGK, IGL) and four TR loci (TRA, TRB, TRG, TRD), with a distinct repertoire of the variable (V), diversity (D), joining (J) and constant (C) genes. The human genome comprises a total number of 610-667 IG and TR genes (373-424 IG and 227-234 TR) per haploid genome, depending on the haplotypes, per haploid genome [1, 2] of which 531-588 genes are located in the major loci (distributed on 14q11.2p, 105-109 J and 25-29 C genes). There are also 25 IG genes (70 IG and 9 TR) including two processed IG genes, outside the major loci. The number of functional IG and TR genes is 308-356 (137-171 IG and 172-185 TR) per haploid genome. All these genomic data are managed in the IMGT® gene database, IMGT/GENE-DB [3].

Total number of IG genes

The human genome comprises 373-424 IG genes (303-354 genes located in the 3 major IG loci and 70 orphons), represented in 14q11.2p of the human genome. The functional IG genes (137-171 depending on the haplotypes) are located in the 3 major IG loci. Different molecular mechanisms (V-J and V-D-J rearrangements, N-diversity), unique to vertebrates, allow to create a huge repertoire of 2x10^10 Ig (or antibodies) per individual.

Number of functional IG genes

The functional IG genes (137-171 depending on the haplotypes) are located in the 3 major Ig loci. Different molecular mechanisms (V-J and V-D-J rearrangements, N-diversity), and for Ig, somatic hypermutations), unique to vertebrates, allow to create a huge repertoire of 2x10^10 Ig (or antibodies) per individual.

Total number of TR genes

The human genome comprises 237-243 TR genes (228-234 genes located in the 4 major TR loci and 9 orphons), per haploid genome. The functional TR genes (127-185 depending on the haplotypes) are located in the 4 major TR loci. Different molecular mechanisms (V-J and V-D-J rearrangements, N-diversity), and in IG, somatic hypermutations), unique to vertebrates, allow to create a huge repertoire of 2x10^10 Tr (or antibodies) per individual.