

## Gene Section

### Mini Review

# IGL (Immunoglobulin Lambda)

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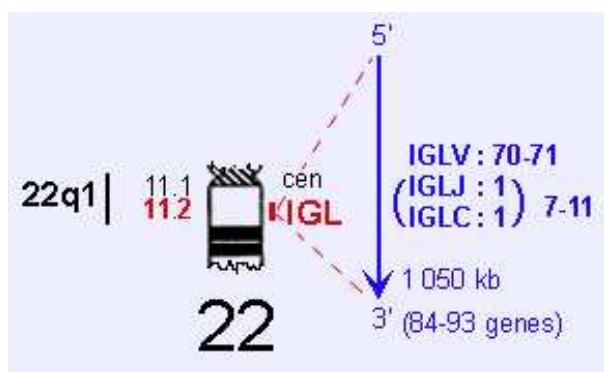
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## Identity

HGNC (Hugo): IGL@

Location: 22q11.2



For complete Figure, see the international ImMunoGeneTics information system; Copyright 1995-2003 IMGT.

## Note

The human IGL locus is located on chromosome 22 on the long arm, at band 22q11.2. The orientation of the locus has been determined by the analysis of translocations, involving the IGL locus, in leukemia and lymphoma. Sequencing of the long arm of chromosome 22 showed that it encompasses about 35 megabases of DNA and that the IGL locus is localized at 6 megabases from the centromere. Although the correlation between DNA sequences and chromosomal bands has not yet been made, the localization of the IGL locus can be refined to 22q11.2.

## DNA/RNA

### Description

The human IGL locus at 22q11.2 spans 1050 kb. It consists of 70 to 71 IGLV genes, localized on 900 kb, 7 to 11 IGLJ and 7 to 11 IGLC genes depending on the haplotypes, each IGLC gene being preceded by one IGLJ segment.

Fifty-six to 57 genes belong to 11 subgroups, whereas 14 pseudogenes which are too divergent to be assigned to subgroups, have been assigned to 3 clans.

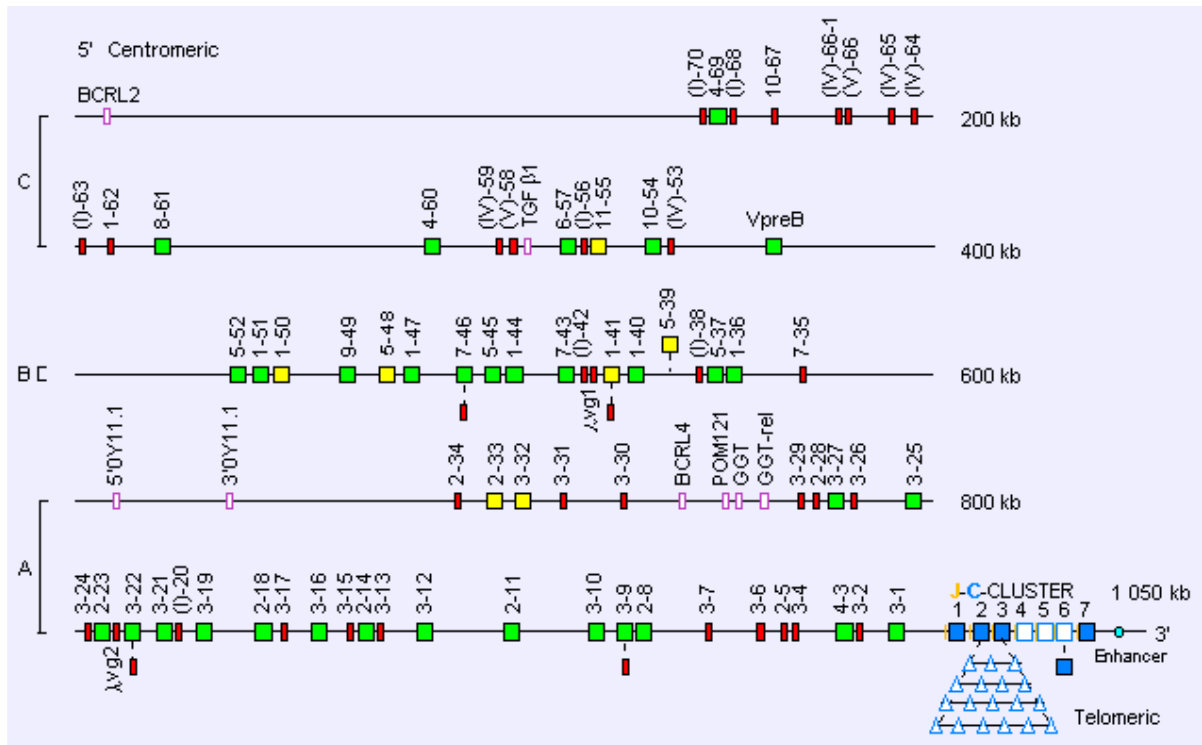
The most 5' IGLV genes occupy the more centromeric position, whereas the IGLC genes, in 3' of the locus, are the most telomeric genes in the IGL locus.

The potential genomic IGL repertoire comprises 29 to 32 functional IGLV genes belonging to 10 subgroups, 4 to 5 IGLJ, and 4 to 5 IGLC functional genes in the 7-IGLC gene haplotype. One, 2, 3 or 4 additional IGLC genes, each one probably preceded by one IGLJ, have been shown to characterize IGLC haplotypes with 8, 9, 10 or 11 genes, but these genes have not yet been sequenced.

Two IGLV orphans have been identified on chromosome 8 at 8q11.2 and one of them belonging to subgroup 8 has been sequenced.

The recent sequencing of the chromosome 22q showed that the IGL locus is localized at 6 megabases from the centromere. Two IGLC orphans and two IGLV orphans have also been characterized on 22q outside of the major IGL locus (See also IMGT Repertoire).

The total number of human IGL genes per haploid genome is 84-93 (90-99 genes, if the orphans are included) of which 37-42 genes are functional.



V-GENE: Green box: Functional; Yellow box: Open reading frame; Red: Pseudogene.  
 J-GENE: Grey: Functional.

C-GENE: Blue: Functional; Blue open box: Pseudogene; Blue triangle: Not sequenced.  
 GENES NOT RELATED: Purple open box: Pseudogene.

For complete Figure, see the international ImMunoGeneTics information system; Copyright 1995-2003 IMGT.

## Protein

### Description

Proteins encoded by the IGL locus are the immunoglobulin lambda chains. They result from the recombination (or rearrangement), at the DNA level, of two genes: IGLV and IGLJ, with deletion of the intermediary DNA to create a rearranged IGLV-J gene. The rearranged IGLV-J gene is transcribed with one of the IGLC genes and translated into an immunoglobulin lambda chain.

Translation of the variable germline genes involved in the IGLV-J rearrangements are available at IMGT Repertoire.

Compared to the germline genes, the rearranged variable genes will acquire somatic mutations during the B cell differentiation in the lymph nodes, which will considerably increase their diversity. These somatic mutations can be analysed using the IMGT/V-QUEST.

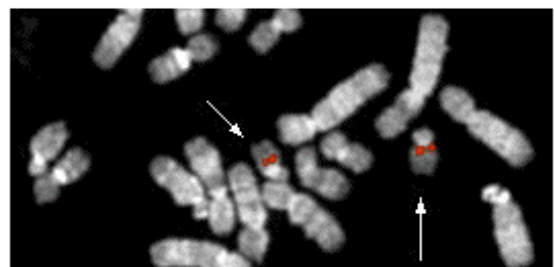
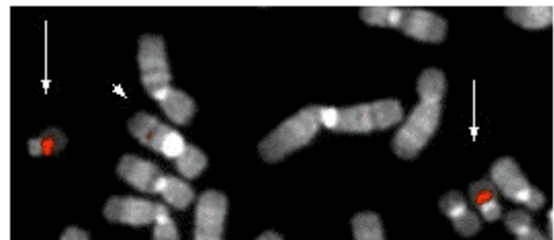
## Mutations

### Note

Mutations which correspond to allelic polymorphisms of the functional germline IGLV, IGLJ and IGLC genes are described in the IMGT database.

## Implicated in

**Translocations which frequently result from errors of the recombinase enzyme complex (RAG1, RAG2, etc.), responsible of the Immunoglobulin and T cell receptor V-J and V-D-J rearrangements. IGLV or IGLJ recombination signals or isolated heptamer are observed at the breakpoints.**



c-Immunoglobulin gene IgL at 22q11, in normal cells: PAC 1019H10 and PAC 86911 - Courtesy Mariano Rocchi.

**t(3;22)(q27;q11)****t(8;22)(q24;q11)**

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