

Gene Section

Mini Review

TRD@ (T cell Receptor Delta)

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Identity

Other names: TRD (T cell Receptor Delta)

HGNC (Hugo): TRD@

Location: 14q11.2

Note: The TRD locus is embedded in the TRA locus, between the TRAV and TRAJ genes. The orientation of the locus has been determined by the analysis of translocations, involving the TRD locus, in leukemia and lymphoma.

DNA/RNA

Description

The human TRD locus at 14q11.2 comprises a cluster of one TRDV gene (TRDV2), three TRDD segments, and four TRDJ segments, upstream of

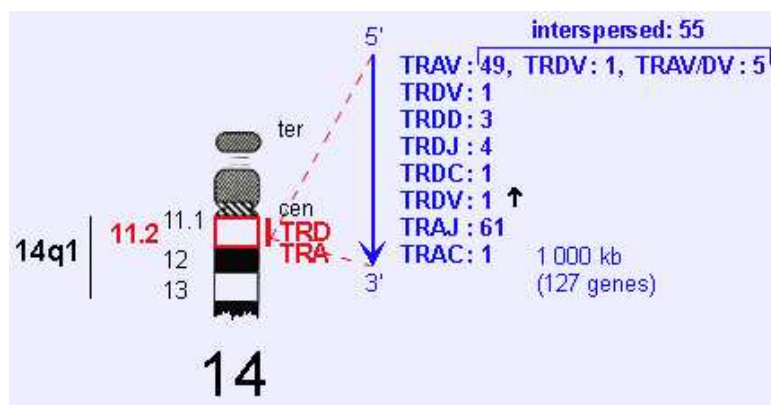
the unique TRDC gene; another TRDV gene (TRDV3) is localized downstream of the TRDC gene, in inverted orientation of transcription.

This cluster spans 60 kb and is localized inside the TRA locus, between the TRAV genes and the TRAJ segments. One TRDV gene (TRDV1) is localized at 360 kb upstream of the TRDC gene, among the TRAV genes. Five variable genes have been found rearranged to both (D)J segments of the TRD locus and TRAJ segments, and can therefore be used for the synthesis of both delta and alpha chains. These genes are described as TRAV/DV.

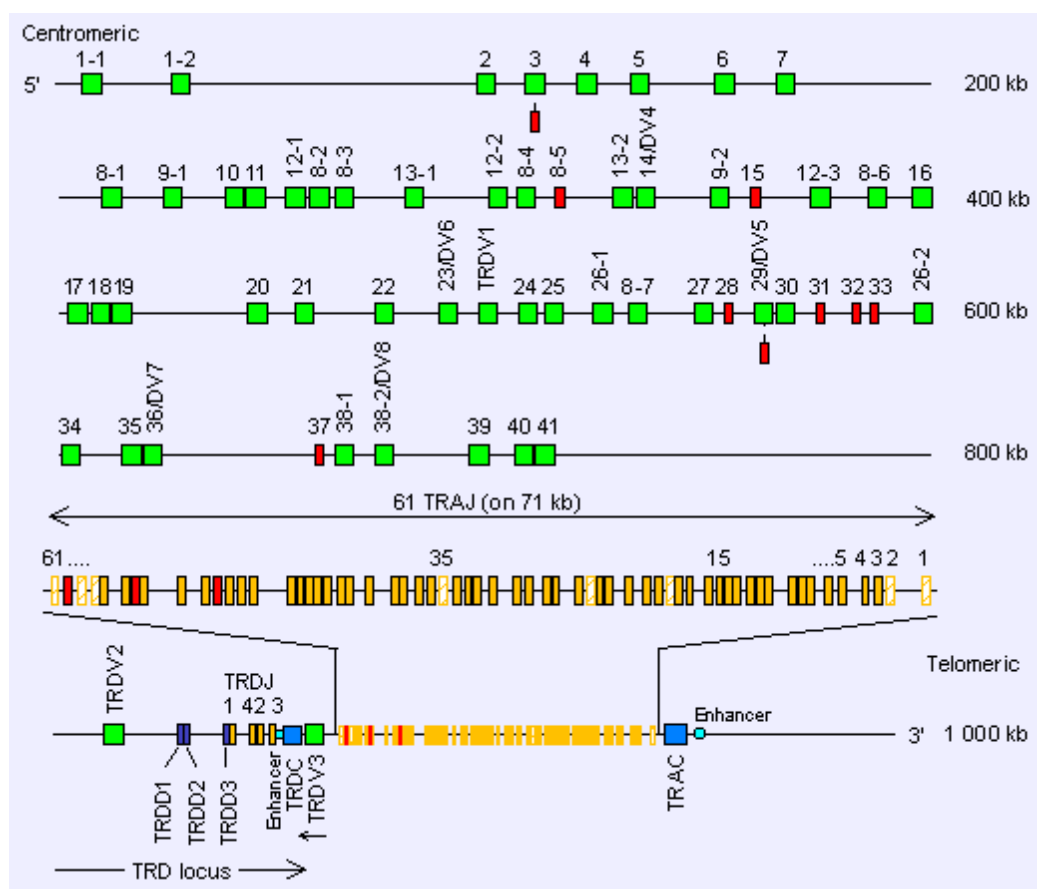
The TRDV genes are unique members of different subgroups. All the TRD genes are functional, with the exception of one TRAV/DV, which has been found either functional or as a pseudogene.

Enhancer sequences have been described between the TRDJ3 and the TRDC gene.

List of the human TRD genes.



For complete Figure, see: chromosome 14, IMGT (The International ImMunoGeneTics information system ®) © Copyright 1995-2003 IMGT, IMGT is a CNRS trademark.



TRA/TRD

V-GENE: Green box: Functional; Red: Pseudogene.

D-GENE: Blue: Functional.

J-GENE: Yellow: Functional; Pale yellow: Open reading frame; Red: Pseudogene.

C-GENE: Blue: Functional.

For complete Figure, see: locus TRD, IMGT (The International ImMunoGeneTics information system ©) © Copyright 1995-2003 IMGT, IMGT is a CNRS trademark.

Protein

Description

Proteins encoded by the TRD locus are the T cell receptor delta chains. They result from the recombination (or rearrangement), at the DNA level, of three genes: TRDV, TRDD and TRDJ, with deletion of the intermediary DNA to create a rearranged TRDV-D-J gene. The rearranged TRDV-D-J gene is transcribed with the TRDC gene and translated into a T cell receptor delta chain.

Translation of the variable germline genes involved in the TRDV-D-J rearrangements are available at IMGT Repertoire Protein displays. TRD V-D-J rearrangements can be analysed using the IMGT/V-QUEST tool.

Mutations

Note

Mutations which correspond to allelic polymorphisms

of the functional germline TRDV, TRDD, TRDJ and TRDC genes are described in the IMGT database: (IMGT Repertoire>Alignments of alleles).

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. TRDV, TRDD or TRDJ recombination signals or isolated heptamer are frequently observed at the breakpoints.

t(1;14)(p32;q11); involve TAL1 in 1p32

Prognosis

Median survival > 5 yrs in children.

t(8;14)(q24;q11); involve MYC in 8q24

Disease

T-cell acute lymphocytic leukemia (ALL); rare

t(10;14)(q24;q11); involve HOX11 in 10q24**Disease**

T-cell acute lymphoblastic leukemia (ALL) and non-Hodgkin lymphoma (NHL).

Prognosis

Not unfavourable.

t(11;14)(p13;q11); involve RBTN2 in 11p13**Disease**

T-cell acute lymphocytic leukemia (ALL).

t(11;14)(p15;q11); involve RBTN1 in 11p15**Disease**

T-cell Acute lymphocytic leukemia (ALL).

t(14;14)(q11;q32), inv(14)(q11q32); involve TCL1 in 14q32**Disease**

T-cell prolymphocytic leukemia (T-PLL) and adult T cell leukemia/lymphoma

Prognosis

Poor

References

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