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Gene Section
Mini Review

TAL1 (T-cell acute leukemia 1)

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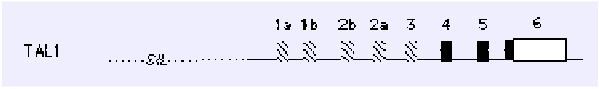
Identity

Other names: SCL (stem cell leukaemia), TCL5 (T cell leukaemia 5)
Location: 1p32

DNA/RNA



DNA diagram

Description

8 exons; 16 kb; SIL (a different gene) sits 90 kb further in 5'.

Transcription

(Complex) alternate splicing of: 1A with 2A, or 3 vs 1B, 2B, 3... or directly 4, 5, 6.

Protein

Description

331 amino acids for the major form of 48 kDa; a truncated form of 26 kDa only in some T-ALL; domains: prolin rich in N-term; poly Gly; basic Helix-Loop-Helix from the exon 6.

Expression

In hematopoietic stem cells, erythroid and megakaryocytic lineages of the adult and in the embryonic brain; indispensable for the genesis of the hematopoietic system.

Function

Transcription factor; exhibits sequence-specific DNA binding activity when in dimers with another bHLH protein such as E2A (DNA specific sequences are: CANNTG, especially: CAGATG); direct interactions of the bHLH with the LIM domain of RBTN2 or RBTN1.

Homology

TAL2 in 9q32; LYL1 in 19p13; more distantly: MYC and other members of the MYC family of Helix-Loop-Helix transcription factors.

Implicated in

t(1;7)(p32;q34) or t(1;14)(p32;q11)/T-ALL ⟶ TAL1/TCRB or TAL1/TCRD

Disease
T-cell ALL.
Prognosis
Is not too poor, compared to other T-ALL.

T-ALL with normal karyotype, but with submicroscopic deletions of part of TAL1 in the 5' region ⟶ SIL/TAL1

Disease
Found in 10 to 30% of T-ALL with a normal karyotype.
Hybrid/Mutated Gene
Deletions which place SIL (SCL interrupting sequence) in close 5' of TAL1; hybrid gene with exon 1 from SIL.
Abnormal Protein
TAL1 is under the promoter sequences controle of SIL, a gene active during T cell development.

t(1;3)(p32;p21)/T-ALL ⟶ TAL1/TCTA

Disease
T-cell ALL.

Breakpoints

Note: mainly in 5' in a 1 kb region; but also dispersed in rare cases.

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