Atlas of Genetics and Cytogenetics
in Oncology and Haematology

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Leukaemia Section
Mini Review

t(2;11)(q11;q23)

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Clinics and pathology

Disease

Acute lymplocytic leukemia (ALL) with proB phenotype.

Epidemiology

Three cases reported to date, two infants and one two-year-old child.

Prognosis

Both cases of infant ALL showed a poor survival, 2 and 9 months respectively. The third case, a two-year-old child, achieved complete remission.

Cytogenetics

Cytogenetics molecular

The three reported cases carried different rearrangements involving chromosomes 2 and 11: t(2;11)(p15;p14), t(2;11)(q11;q23) and ins(11;2)(q23;q11.2q11.2).

Probes

LAF4 specific PACs: RP6-44B23 and RP6-226I23.

Genes involved and Proteins

MLL

Location: 11q23

DNA / RNA

13-15 kb mRNA.

Protein

431 kDa; contains two DNA binding motifs (a AT hook, and Zinc fingers), a DNA methyl transferase motif, a bromodomain; transcriptional regulatory factor; nuclear localisation.

LAF4

Location: 2q11-q12

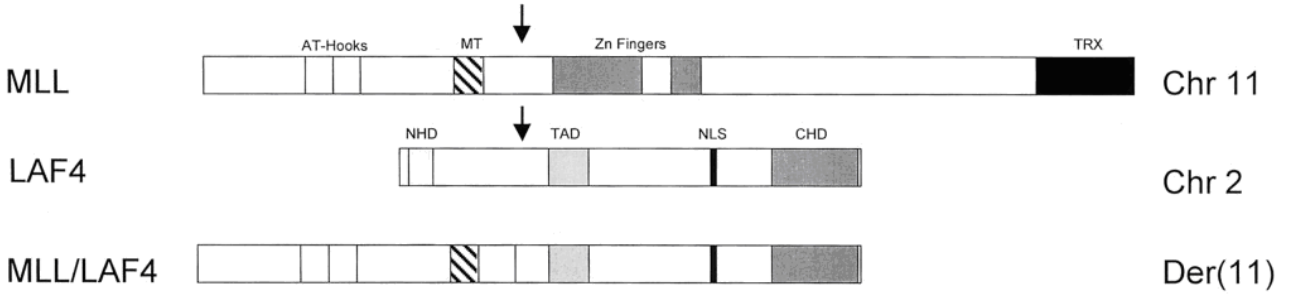
Note: AF4 and AF5q31, also known as MLL fusion partners, belong to the same gene family.

DNA / RNA

22 exons, transcript length: 3855 bp.

Protein

LAF4 protein (Lymphoid nuclear protein related to AF4) 1226 amino acids; 133734 Da.



Schematic representation of MLL, LAF4, and the putative MLL-LAF4 fusion protein. MT, methyltransferase domain; TRX, Drosophila trithorax homology; NHD, N-terminal homology domain; TAD, transactivation domain; NLS, nuclear localization sequence; CHD, C-terminal homology domain.

Results of the chromosomal anomaly

Hybrid gene

Transcript

5' MLL - 3' LAF4

Fusion protein

Description

The MLL-LAF4 fusion protein includes the transactivation domain of LAF4 that is part of the AF4/LAF4/FMR2 homology domain.

References

von Bergh ARM, Beverloo HB, Rombout P, van Wering ER, van Weel MH, Beverstock GC, Kluin PM, Slater RM, Schuuring E. LAF4, an AF4-related gene, is fused to MLL in infant acute lymphoblastic leukemia. Genes Chromosomes Cancer 2002, 35, 92-96.

Bruch J, Wilda M, Teigler-Schlegel A, Harbott J, Borkhardt A, Metzler M. Occurrence of an MLL/LAF4 fusion gene caused by the insertion ins(11;2)(q23;q11.2q11.2) in an infant with acute lymphoblastic leukemia. Genes Chromosomes Cancer 2003;37:106-109.

Hiwatari M, Taki T, Taketani T, Taniwaki M, Sugita K, Okuya M, Eguchi M, Ida K, Hayashi Y. Fusion of an AF4-related gene, LAF4, to MLL in childhood acute lymphoblastic leukemia with t(2;11)(q11;q23). Oncogene 2003;22:2851-2855.

Ma C, Staudt LM. LAF-4 encodes a lymphoid nuclear protein with transactivation potential that is homologous to AF-4, the gene fused to MLL in t(4;11) leukemias. Blood 1996;87:734-745.

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