Leukaemia Section

Mini Review

\textit{t(11;19)(q23;p13.3)}

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Published in Atlas Database: December 1997

Online version is available at: http://AtlasGeneticsOncology.org/Anomalies/t1119ENL.html

DOI: 10.4267/2042/32074

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\section*{Identity}

\textbf{Note:} two different translocations (and two clinical entities), both involving 11q23 with a common breakpoint in MLL, and 19p13 with different breakpoints are now identified: the above mentioned, and the \textit{t(11;19)(q23;p13.1)}.

\section*{Clinics and pathology}

\subsection*{Disease}

\textbf{Phenotype / cell stem origin}

B-cell ALL: L1/L2 CD19+, CD10- most often; biphenotypic: CD19+ (B-cell) as well, but also with myeloid markers; ANLL: M4/M5 mainly; therapy related AL; T-cell ALL at times.

\textbf{Epidemiology}

Most cases are found in infants < 1 yr (congenital leukaemia), whatever the phenotype except in T-cell cases (children cases); such a feature is particularly striking; most female cases exhibit a B-lineage or biphenotypic phenotype, most male cases are M4/M5 cases.

\textbf{Clinics}

Organomegaly, frequent CNS involvement (in B-cell/biphenotypic cases); blood data: high WBC.

\textbf{Treatment}

BMT is indicated.

\textbf{Prognosis}

Very poor (median < 1 yr), except in the rare T-cell cases, who are, so far, long survivors.

\section*{Cytogenetics, morphological}

Can be seen with G-banding: chromosome 11 appears shortened, chromosome 19 enlarged (11q- and 19p+); will be missed with R-banding.
**Cytogenetics, molecular**

Therefore, FISH may be needed.

**Additional anomalies**

None in most cases; +X may be found in male and female patients; +6, +8, +19.

**Variants**

Three way complex t(11;19;Var) exist, as well as complex rearrangements and inversions, and are frequent; they demonstrated that the crucial event lies on der(11).

**Genes involved and Proteins**

**MLL**

**Location:** 11q23

**DNA / RNA**

21 exons, spanning over 100 kb; 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.

**ENL**

**Location:** 19p13.3

**Protein**

Serine/proline; contains a nuclear targeting sequence; wide expression; nuclear localisation; transcription activator.

**Fusion protein**

**Expression localisation**

AT hook and DNA methyltransferase from MLL fused to, most often, the nearly entire ENL.

**To be noted**

Shortly, both t(11;19): have a breakpoint in MLL in 11q23, a very poor prognosis, and may, in some cases be treatment related leukaemias; but, while the above described has a breakpoint in 19p13.3, can be seen with G-banding (11q- and 19p+) and missed with R-banding, involves ENL, and can be found in ALL, biphenotypic leukaemias, and ANLL, the translocation with a breakpoint in 19p13.1 involves ELL, is found with R-banding (11q+ and 19p-) and missed with G-banding, and only in ANLL.

**References**


This article should be referenced as such: