

## Gene Section

### Mini Review

# MLLT7 (myeloid/lymphoid or mixed-lineage leukemia (trithorax homolog, *Drosophila*); translocated to, 7)

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Published in Atlas Database: August 2001

Online updated version : <http://AtlasGeneticsOncology.org/Genes/AFX1ID57.html>  
DOI: 10.4267/2042/37774

This article is an update of: Bernard O. AFX1 (ALL1 fused gene from chromosome X, 1). Atlas Genet Cytogenet Oncol Haematol.1998;2(3):74.

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## Identity

**Other names:** AFX1 (ALL1 fused gene from chromosome X, 1); MLLT7 (myeloid/lymphoid leukemia translocated to, 7); AFX; FOXO4

**HGNC (Hugo):** FOXO4

**Location:** Xq13



Probe(s) - Courtesy Mariano Rocchi, Resources for Molecular Cytogenetics.

## DNA/RNA

### Transcription

7,5kb consisting of 3 exons. RNA App. 3.5 kb mRNA; coding sequence. Placental secondary transcript: App. 2.8kb Expression pattern: Heavily expressed in skeletal muscle, placenta and ovary.

## Protein

### Description

504 amino acids; NH2 -- similarity region with AF6q21 and FKHR -- forkhead motif -- COOH.

### Expression

Wide.

### Localisation

Nuclear.

### Function

Transcription factor binding to the motive TTGTTTAC. Target genes: Akt, AFX is able to induce Rb-independent, p27kip1-mediated G1-arrest. Phosphorylation of AFX by protein kinase B inhibits its transcriptional activity.

### Homology

daf-16 (*C.elegans*) and other forkhead-transcription factors (i.e. FKHR, FKHL1, FKHRP1, FKHL1P1) and AF6q21, involved in the t(6;11)(q21;q23). In the fusion protein AFX/MLL, AFX fuses to MLL in the same aminoacid as FKHR fuses to PAX3 in the PAX3/FKHR-fusion protein of alveolar rhabdomyosarcoma.

## Implicated in

**t(X;11)(q13q23)/acute leukaemias --> MLL - AFX**

### Disease

ANLL, T-ALL.

### Prognosis

Very poor.

**Hybrid/Mutated gene**

5' MLL-3' AFX as well as the reciprocal 5' AFX-3' MLL on DNA and mRNA level.

**Abnormal protein**

Comprises about 1400 amino acids from N-term MLL and 354 amino acids from AFX C-term; the reciprocal may be expressed.

## References

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*This article should be referenced as such:*

Bojesen SE. MLLT7 (myeloid/lymphoid or mixed-lineage leukemia (trithorax homolog, Drosophila); translocated to, 7). *Atlas Genet Cytogenet Oncol Haematol*. 2001; 5(4):259-260.

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