

## inv(8)(p11q13)

### Identity

**Note** Two distinct clinical syndromes have been associated with the 8p11-12 region :

Stem-cell myeloproliferative disorder with [FGFR1](#) rearrangement  
AML M4 or M5 erythrophagocytosis-associated with MOZ rearrangement.  
the inv(8)(p11q13) involves MOZ

The partners of 8p11 are [8q13](#), 14q11, 16p13, 19q13, 22q13 and 3q27, 17q12 in a complexe translocation t(3;8;17)(q27;p11; q12).

### Clinics and Pathology

**Disease** Acute myelomonocytic or monocytic leukaemia (M4, M5a, M5b FAB) with erythrophagocytosis by blasts.

[Acute myeloblastic leukemia M0/M1 FAB](#) (one case).

**Epidemiology** Rare. Young age (6 patients, median : 23.5 years) and female sexe.

**Cytology** Morphology feature observed in [AML](#) with t(8;16).

**Prognosis** Probably poor.

### Cytogenetics

**Cytogenetics** Inv(8) (p11q13) is a variant of [t\(8;16\) \(p11;p13\)](#)

**Morphological**

**Additional anomalies** In one case der(10)t(1;10)(q25;p15)

### Genes involved and Proteins

**Gene Name** MOZ

**Location** 8p11

**Note** MOZ contains a LAP (Leukemia associated protein) zinc finger domain , a HAT domain (Histone acetyltransferase) and a acidic domain.  
Detection by FISH : YAC 176C9.

**Protein** ZNF220

Monocytic leukemia zinc finger protein.

2004 amino acids and 225 kDa nuclear protein, with 2 LAP/PHD-type zinc fingers.

MOZ is a histone acetyltransferase (HAT) and the founding member of the MYST family of HATs, a family that includes proteins involved in cell cycle regulation, chromatin remodeling and dosage compensation.

MOZ plays an important role during hematopoiesis with his transcriptional coregulator activity.

**Gene Name** TIF2

**Location** 8q13

**Note** Aliases : GRIP1, NCoA-2.

Nuclear receptors are ligand-inductible transcription factors with three structural domains : an activation function AF-1, a DNA-binding domain

and a second activation function AF-2 that is mediated by nuclear coactivators (NRCoAs) : TIF2 was recently shown to be one such mediators of AF-2 function.

Detection by FISH : PAC clone 192D10

**Protein** The TIF-2 protein is homologous to other NRCoAs specically SRC-1 (alias NcoA-1). This protein have HAT activity and also interacts directly with [CBP](#). It is likely that TIF-2 mediates transcriptional activation by a mechanism involving chromatin remodeling.

### Result of the chromosomal anomaly

**Hybrid gene** The fusion gene produces a mRNA containing the 5' end of MOZ appended in translational frame to the 3' end of TIF2.

**Description** The inv(8) MOZ breakpoint is distinct from the breakpoint in the MOZ - CBP fusion.

The fusion product retains the zinc fingers, the HAT domain of MOZ along with the HAT domains and CBP interacting domain of TIF2.

### Fusion

**Protein** MOZ-TIF2

**Description**

**Oncogenesis** The ability of HATs to affect the chromatin structure and regulate gene expression is well appreciated. How the MOZ-TIF2 fusion protein is involved in acute leukemia is not known, but it probably affects the chromatin condensation. It may modulate or augment the transcriptional activity of genes normally regulated by MOZ or it may serve as a bridge between MOZ and CBP.

Recently, it was demonstrated that MOZ-TIF2 has transforming properties in vitro and causes AML. The C2HC nucleosome recognition motif of MOZ and MOZ-TIF2 interaction with CBP are essential for transformation.

### External links

**Other database** [inv\(8\)\(p11q13\)](#) [Mitelman database \(CGAP - NCBI\)](#)

### To be noted

Additional cases are needed to delineate the epidemiology of this rare entity:  
**you are welcome to submit a paper to our new [Case Report](#) section.**

### Bibliography

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