AF4p12 (ALL1 fused gene from chromosome 4p12)

Sandrine Hayette

Laboratoire d’Hématologie et de cytogénétique, Hôpital Ed Herriot and INSERM U590, Lyon, France

Identity

Hugo: FRYL
Other names: DKFZp686E205; KIAA0826
Location: 4p12
Note: AF4p12 must be considered as a human ortholog of Drosophila Furry gene.

DNA/RNA

Description
The genomic size of the gene is about 185 kb and contains at least 61 exons.

Transcription
mRNA size are about 11,42 kb with a large open reading frame of 9,318 kb. mRNA are expressed in a wide spectrum of normal tissues. The highest steady-state levels are in colon, placenta and brain.

Pseudogene
No known pseudogene.

Protein

Description
The protein size is 3105 amino acids. It contains two potential leucine zipper domains (aa 1229-1250 and 2923-2944).

Expression
See above the mRNA expression, protein expression has not been studied.

Localisation
Not determined.

Function
Not determined but displays transcriptional activation potential.

Homology
AF4p12 shows about 60% identity to the human protein CAB42442. Two paralogs are found in human, rat and chicken, and one ortholog is found in Drosophila, C elegans, and Arabidopsis.

Implicated in

t(4;11)(p12;q23)/Treatment-related acute lymphoblastic leukemia (t-ALL) → MLL-AF4p12

The t(4;11) translocation breakpoint between exon 6 from the MLL gene and exon 49 from AF4p12. Black bars, chromosome 11 DNA regions; grey bars, chromosome 4 DNA regions. MLL exons are indicated by black boxes, AF4p12 exons are indicated by grey boxes.

Schematic representation of the domain structures of MLL and of the MLL-AF4p12 fusion protein. MT, DNA methyltransferase homology domain; SET, SET domain; LZ, Leucine Zipper domain. Arrows show the fusion point. Numbers refer to the positions of amino acids in wild-type MLL or AF4p12. In the predicted chimeric MLL/AF4p12 fusion protein, the MLL zinc finger and the MLL SET domains have been replaced by the AF4p12 leucine zipper domain.
Disease
B-ALL.

Prognosis
Only one patient described, but she died one month after ALL diagnosis.

Cytogenetics
Translocation t(4;11)(p12;q23).

Hybrid/Mutated Gene
MLL-AF4p12.

Abnormal Protein
MLL-AF4.

Oncogenesis
The fusion domain of AF4p12 to the chimeric protein MLL-AF4p12 displays transcriptional activation potential and the gain of transcriptional effector properties could contribute to the transformation of lymphoid progenitor by the fusion protein.

References

This article should be referenced as such: