Atlas of Genetics and Cytogenetics in Oncology and Haematology

OPEN ACCESS JOURNAL AT INIST-CNRS

Gene Section
Mini Review

AF4p12 (ALL1 fused gene from chromosome 4p12)

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Published in Atlas Database: October 2005

Online updated version: http://AtlasGeneticsOncology.org/Genes/AF4q12ID42970ch4p12.html
DOI: 10.4267/2042/38286

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.

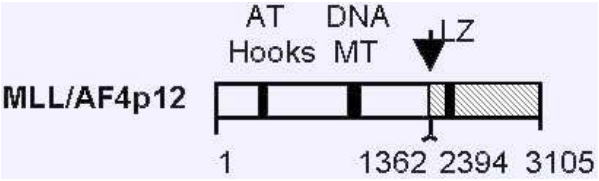
Homology

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 In the predicted chimeric MLL/AF4p12 fusion protein, the MLL zinc finger and the MLL SET domains have been replaced by the AF4p12 leucine zipper domain.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

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This article should be referenced as such:
Hayette S. AF4p12 (ALL1 fused gene from chromosome 4p12). Atlas Genet Cytogenet Oncol Haematol.2006;10(2):68-69.