Gene Section
Mini Review

AATF (Apoptosis Antagonizing Transcription Factor)

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Identity

Hugo: AATF
Other names: DED; CHE1; CHE-1
Location: 17q12
Note: AATF affects cell growth by interfering with the recruitment of HDAC1 by retinoblastoma protein. Its over-expression activates DNA synthesis in quiescent NIH-3T3 cells through HFDAC1 displacement. Also, it is considered as a general HDAC1 competitor and its down-regulation is involved in colon carcinoma cell proliferation. It is also found to bind to TSG101 in a process that enhances androgen receptor-mediated transcription by promoting its mono-ubiquitination. It has been observed lately that AATF 12th exon truncation by HIV-1 specific encoded miRNA leads to HIV-1 disease progression. On other side its over-expression has been observed in various leukemic cell lines and is considered to be important for maintaining leukemic state.

DNA/RNA

Note: Protein AATF (Apoptosis-antagonizing transcription factor) (Rb-binding protein Che-1). Total gene size being 107.996 kb and having transcribed region of 2.141 kb it codes for 561 amino acids.

Description
Spans on 107.996 kb on genomic fragment and contains 12 exons.

Transcription
2023 bp mRNA.

Pseudogene
No pseudogenes for AATF are known.

Protein

Note: 561 amino acids long protein contains POLR2J binding site at 273-315 amino acids, RB1 binding site at 316-372 amino acids, RB1 and SP1 binding site at 373-472 amino acids and Glu-rich region at 96-195 amino acids.

Description
AATF was identified as an interacting partner with MAP3K12/DLK which happens to be a protein kinase known to be involved in the induction of cell apoptosis. Its protein contains a leucine zipper, which is a characteristic motif of transcription factors, and was shown to exhibit strong transactivation activity when fused to Gal4 DNA binding domain. Overexpression of this gene interfered with MAP3K12 induced apoptosis.

Expression
Ubiquitously expressed. Expressed at high levels in brain, heart, kidney, placenta, thymus and moderate levels in blood mononuclear cells.

Localisation
Nucleus; nucleolus.

Function
It functions as a general inhibitor of the histone deacetylase HDAC1. Binding to the pocket region of RB1 may displace HDAC1 from RB1/E2F complexes, leading to activation of E2F target genes and cell cycle progression. Conversely, displacement of HDAC1 from SP1 bound to the CDKN1A promoter leads to increased expression of this CDK inhibitor and blocks cell cycle progression. Also antagonizes PAWR mediated induction of aberrant amyloid peptide production in Alzheimer disease (presenile and senile...
dementia), although the molecular basis for this phenomenon has not been described to date.

**Mutations**

**Note:** Several polymorphisms have been identified and but none of them has shown any association with any disease.

**Implicated in**

**Leukemia**

**Note:** AATF plays a major role in immortalization of leukemic cells through up-regulation of Bcl2 gene expression.

**Disease**

Haematopoitic malignancies

AATF dependent cross talk between cellular apoptosis and proliferation.

**AIDS**

**Note:** HIV-1 encodes a specific miRNA that has the inherent capacity to cleave 12th exon of AATF gene resulting in truncated AATF gene product which is destined to undergo degradation. Down-regulation of AATF gene expression is always accompanied by significant reduction in cell viability and down-regulation of gene coding for dicer which plays a crucial role in providing immunity at the nucleic acid level.

**Disease**

Immunodeficiency, Lymphoadenopathy, Kaposi's sarcoma, AIDS dementia.

HIV-1 encoded miRNA dependent AATF gene down-regulation and subsequent cell death.

**References**


This article should be referenced as such: