Atlas of Genetics and Cytogenetics in Oncology and Haematology

OPEN ACCESS JOURNAL AT INIST-CNRS

Gene Section
Mini Review

ELAC2 (elaC homolog 2 (E. coli))

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Published in Atlas Database: February 2008

Online updated version: http://AtlasGeneticsOncology.org/Genes/ELAC2ID40437ch17p11.html
DOI: 10.4267/2042/38596

Identity

Hugo: ELAC2
Other names: HPC2; TRZ1 (tRNaseZL)
Location: 17p11.2
Local order: Telomeric to HS3ST3A1 and centromeric to KIAA0672.
Note: There is a human paralog of this gene on chromosome 18 called ELAC1 that is homologous to the C-terminal half of ELAC2.

DNA/RNA

Note: Ubiquitously expressed in a variety of tissues, tumors and developmental stages.

Description

The genomic size of ELAC2 gene is about 25.6 kb representing a mRNA of 2966 bp with 26 exons.

Transcription

There is no evidence of alternative splicing of the transcript.

Pseudogene

No known pseudogenes.

Protein

Description

ELAC2 gene encodes a protein of 826 amino acids. Orthologs are found in Eukaryotes including M. musculus, R. norvegicus, C. elegans, D. melanogaster, S. cerevisiae, S. pombe and A. thaliana.

Expression

Not determined.

Localisation

Not determined. But is implicated in nucleus upon overexpression in cell lines. Yeast ortholog (TRZ1p) is detected in cytosol, nucleus and mitochondria via large-scale analysis with GFP tagged gene product.

Function

ELAC2 has tRNA processing activity as detected by in vitro biochemistry assays. The N-terminus of ELAC2 is required for the Rnase 65 activity. The C-terminus (481-826 aa) of ELAC2, which is homologous to ELAC1, possesses tRNA 3' processing endoribonuclease acitivity (tRNaseZ). Overexpressed ELAC2 binds gamma-tubulin complex and is involved in cell cycle regulation. ELAC2 has also been shown to potentiate TGF-beta-induced growth arrest of prostate cells via over-expression upon transfection and down-regulation via siRNA.

Mutations

Germinal

One pedigree-specific insertion/frameshift, 1641insG, resulting in frameshift after L547, and leading to termination after the miscoding of 67 residues. Four missense variants, S217L, A541T, E622V and R781H.

Somatic

Not determined.

Implicated in

Prostate Cancer

Note: TGF-beta signaling mediated growth arrest via physical interactions with Smad2 / Smad3 and FAST-1, and potentiation of Smad2-driven $(ARE)_2$-Luciferease reporter activity. Also implicated in RNA processing.

Disease

Hereditary prostate cancer and sporadic prostate cancer.

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This article should be referenced as such:

Chen Y, Tavtigian S, Shattuck D. ELAC2 (elaC homolog 2 (E. coli)). Atlas Genet Cytogenet Oncol Haematol.2008;12(6):430-431.