

Gene Section

Mini Review

HSPH1 (heat shock 105kDa/110kDa protein 1)

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Published in Atlas Database: February 2007

Online updated version: <http://AtlasGeneticsOncology.org/Genes/HSPH1ID40891ch13q12.html>
DOI: 10.4267/2042/38439

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Identity

Hugo: HSPH1
Other names: HSP105alpha; HSP105beta; HSP110; HSP105; KIAA0201; NY-CO-25
Location: 13q12.3

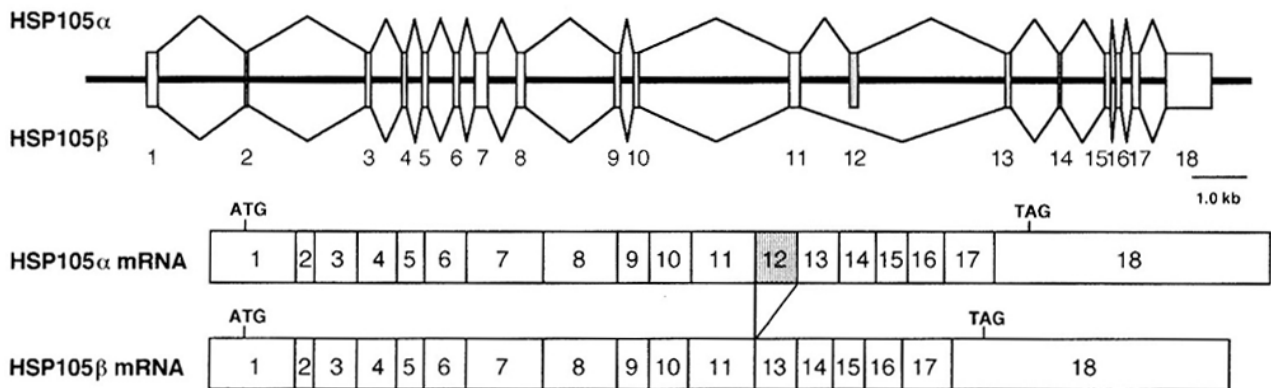
DNA/RNA

Description

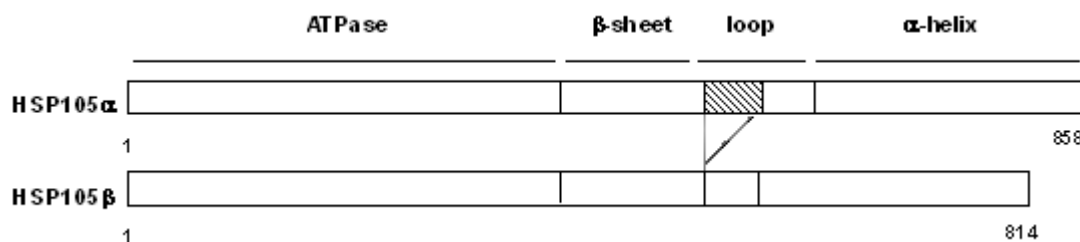
18 exons on 22 kb.

Transcription

Hsp105alpha is transcribed constitutively and also by a variety of stresses. 4 kb mRNA Hsp105beta is an alternative spliced isoform only produced during heat shock at 42 degree.



Genomic organization of the mouse HSP105 gene. The linear map of the exon-intron structure is shown schematically. Exons are represented as numbered boxes. Two alternative splicing patterns gave rise to HSP105alpha and HSP105beta transcripts. ATG and TAG indicate the positions of initiation and termination codons, respectively. (DDBJ/EMBL/GenBank DNA databases with accession Nos. AB005267-AB005282).



Schematic structures of HSP105alpha and HSP105beta proteins. Shaded box represents the spliced out region of HSP105alpha which is lacking in HSP105beta.

Protein

Description

Hsp105alpha: 858 amino acids, 105 kDa; contains an ATP binding domain (residues 1-383), b-sheet domain (residues 384-511), loop domain (residues 512-607) and alpha-helix domain (residues 608-858).

Hsp105beta: 814 amino acids, 90 kDa; contains an ATP binding domain (residues 1-383), b-sheet domain (residues 384-511), loop domain (residues 512-563) and alpha-helix domain (residues 564-814).

Expression

Wide, highly expressed in brain.

Localisation

Hsp105alpha, cytoplasmic; Hsp105beta, nuclear.

Function

Hsp105alpha and Hsp105beta suppress the aggregation of denatured proteins; function as a substitute for Hsp70 family proteins to suppress the aggregation of denatured proteins in cells under severe stress; regulate substrate binding cycle of Hsp70/Hsc70 by inhibiting the ATPase activity of Hsp70/Hsc70.

Homology

With mouse apg-1, mouse apg-2, sea urchin egg receptor, *C. elegans* 86.9-kDa protein, *A. thaliana* hsp91 and *S. cerevisiae* SSE1, human hsp70 and human hsc70.

Implicated in

Lung cancers

Prognosis

Poor.

Oncogenesis

Low expression of hsp105 was identified as predictors of survival in lung adenocarcinomas.

Colorectal cancers

Prognosis

Survival is not much more than 50% after 5 years.

Oncogenesis

Overexpression of hsp105 is a late event in the colorectal adenoma-carcinoma sequence.

References

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This article should be referenced as such:

Hatayama T, Yamagishi N. HSPH1 (heat shock 105kDa/110kDa protein 1). *Atlas Genet Cytogenet Oncol Haematol*.2007;11(3):197-198.
