Atlas of Genetics and Cytogenetics in Oncology and Haematology

OPEN ACCESS JOURNAL AT INIST-CNRS

Gene Section
Mini Review

CLTC (clathrin heavy polypeptide)

Jean-Loup Huret, Sylvie Senon

Genetics, Dept Medical Information, UMR 8125 CNRS, University of Poitiers, CHU Poitiers Hospital, F-86021 Poitiers, France (JLH, SS)

Published in Atlas Database: August 2003

Online updated version: http://AtlasGeneticsOncology.org/Genes/CLTCID360.html
DOI: 10.4267/2042/38007

This article is an update of :
Huret JL. CLTC (clathrin heavy polypeptide). Atlas Genet Cytogenet Oncol Haematol.2001;5(4):256.

Identity

Other names: clathrin heavy chain; KIAAOO34; CLH-17

HGNC (Hugo): CLTC

Location: 17q23

Note
Must not be confused with CLTCL1 (clathrin heavy polypeptide-like 1).

DNA/RNA

Transcription

6111 bp mRNA.

Protein

Description

1675 amino acids, 191 kDa; is composed, from N-term to C-term, of: a globular domain (amino acids 1-479), a linker (480-523), and the heavy chain arm (524-1675); properties: binding site for ATPase in N term, binding of the light chain in the C-term, and trimerization domain in the C-term. Subunit of clathrin, a structural protein composed of 3 heavy chains (CLTC, CLTCL1), and 2 light chains (CLTA, CLTB), which assembly is mediated by CALM. Form cages. Component of the vesicles matrix originated from the plasma membrane or the Golgi.

Localisation

Vesicles.

Function

Mediate endocytosis of transmembrane receptors.

Implicated in

Anaplasic large cell lymphoma (ALCL) with t(2;17)(p23;q23) --> ALK/CLTC

Disease
ALCL are high grade non Hodgkin lymphomas; ALK+ ALCL are ALCL where ALK is involved in a fusion gene; ALK+ ALCL represent 50 to 60% of ALCL cases (they are CD30+, ALK+); belong to the "cytoplasmic ALK+" subset.

Prognosis
Althouth presenting as a high grade tumour, a 80% five yr survival is associated with this anomaly.

Hybrid/Mutated gene
5' CLTC - 3' ALK.

Abnormal protein
NH2 CLTC - COOH ALK.

Inflammatory myofibroblastic tumors with t(2;17)(p23;q23)

Disease
Rare soft tissue tumour found in children and young adults.

Prognosis
Good prognosis.

Hybrid/Mutated gene
5' CLTC - 3' ALK

References

Kirchhausen T, Harrison SC. Structural domains of clathrin heavy chains. J Cell Biol. 1984 Nov;99(5):1725-34

Kirchhausen T, Harrison SC, Chow EP, Mattaliano RJ, Ramachandran KL, Smart J, Brosius J. Clathrin heavy chain: molecular cloning and complete primary structure. Proc Natl Acad Sci U S A. 1987 Dec;84(24):8805-9

Dodge GR, Kovalszky I, McBride OW, Yi HF, Chu ML, Saitta B, Stokes DG, Iozzo RV. Human clathrin heavy chain (CLTC): partial molecular cloning, expression, and mapping of the gene to human chromosome 17q11-qter. Genomics. 1991 Sep;11(1):174-8

Schmid SL. Clathrin-coated vesicle formation and protein sorting: an integrated process. Annu Rev Biochem. 1997;66:511-48

Kirchhausen T. Clathrin. Annu Rev Biochem. 2000;69:699-727

Bridge JA, Kanamori M, Ma Z, Pickering D, Hill DA, Lydiatt W, Lui MY, Colleoni GW, Antonescu CR, Ladanyi M, Morris SW. Fusion of the ALK gene to the clathrin heavy chain gene, CLTC, in inflammatory myofibroblastic tumor. Am J Pathol. 2001 Aug;159(2):411-5

Cools J, Wlodarska I, Somers R, Mentens N, Pedeutour F, Maes B, De Wolf-Peeters C, Pauwels P, Hagemeijer A, Marynen P. Identification of novel fusion partners of ALK, the anaplastic lymphoma kinase, in anaplastic large-cell lymphoma and inflammatory myofibroblastic tumor. Genes Chromosomes Cancer. 2002 Aug;34(4):354-62

This article should be referenced as such:

Huret JL, Senon S. CLTC (clathrin heavy polypeptide). Atlas Genet Cytogenet Oncol Haematol. 2003; 7(4):222-223.