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Gene Section
Mini Review

CDC20 (cell division cycle 20 homolog (S. cerevisiae))

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Identity

Other names: CDC20A; MGC102824; P55CDC-LSB; bA276H19.3; p55CDC
HGNC (Hugo): CDC20
Location: 1p34.1

DNA/RNA

Description

Start: 43,597,199 bp from pter.
End: 43,601,461 bp from pter.
Size: 4,262 bases.
Orientation: plus strand.
13 exons (Entrez), 15 Exons (Ensembl).

Transcription

1697 bp.

Pseudogene

No.

Protein

Description

Size: 499 amino acids; 54723 Da. Subunit: Interacts with MAD2L1. The phosphorylated form interacts with APC/C. Developmental stage: Synthesis is initiated at G1/S, protein level peaks in M phase and protein is abruptly degraded at M/G1 transition.

Expression

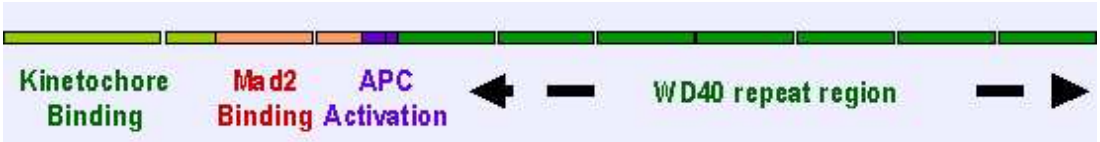
It is expressed in all cells, no tissue specificity.

Localisation

Nucleus.

Function

CDC20 is a key player in the Spindle Assembly Checkpoint (SAC). When a cell is dividing mitotically, the Metaphase to Anaphase transition is stringently monitored by SAC. After proper alignment of all the sister chromatids to the spindle fibers during metaphase, the Mitotic Checkpoint Complex detaches from CDC20 and free CDC20 protein activates the Anaphase promoting Complex (APC) Activated APC can then degrade Securin which frees the protease Separase. Free Separase can now degrade the Cohesin molecules binding the two sister chromatids together. Upon degradation of Cohesin, the two sister chromatids are free and can migrate to the two spindle poles, thus, initiating Anaphase.



The N-terminal amino acids from 1-153 contains most of the functional domains consisting of the Kinetochore binding domain, Mad2 binding domain and the Anaphase promoting complex (APC) activation domain. Amino acids 129-499 contain the WD-repeat region.

Homology

The C-terminal half is highly conserved from humans to yeast.

Mutations

Germinal

No.

Somatic

No.

Implicated in

Various tumors

Disease

There have been few reports of overexpression of CDC20 in various tumors for eg, greater than 3% of Cdc20 expression was found in bladder cancer, breast cancer, cervical cancer, cholangiocellular carcinoma, AML, CML, colon and rectum carcinoma, esophageal cancer, gastric cancer, gastric cancer (diffuse type), liver cancer, lung cancer (NSCLC), lung cancer (SCLC), osteo-sarcoma, pancreatic cancer, prostate cancer, renal carcinoma, soft tissue tumor, testicular tumor (Kidoko T, et al., 2007), head and neck cancer (Mondal G, et al., 2007).

Prognosis

No.

Cytogenetics

No.

Hybrid/Mutated gene

No.

Abnormal protein

No.

Oncogenesis

Overexpression of CDC20 has been observed in several tumor tissues.

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