CENPW (centromere protein W)

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Published in Atlas Database: June 2013
Online updated version : http://AtlasGeneticsOncology.org/Genes/CENPWID51452ch6q22.html
DOI: 10.4267/2042/52069

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Abstract: Short communication on CENPW, with data on DNA/RNA, on the protein encoded and where the gene is implicated.

Identity
Other names: C6orf173, CUG2
HGNC (Hugo): CENPW
Location: 6q22.32

DNA/RNA
Description
Exons: 3, coding exons: 3, introns: 2.

Transcription
Transcript length: 750 bps, open reading frame: 264 bps.

Pseudogene
No pseudogene.

Protein
Description
CENP-W gene encodes 88-amino acid protein which shows ~27% of amino acid sequence similarity to a general transcription repressor, human DR1.

It contains a typical NLS sequence and histone fold region which is critical for binding to centromeric DNA.

Expression
Widely expressed; kidney, colon, breast, liver, lung, ovary, prostate, thyroid, etc.

Localisation
Intracellular, nucleus, centromere, kinetochore, nucleolus.

Function
CENP-W was originally identified as a cancer-upregulated gene 2 (CUG2) which is commonly overexpressed in various human cancer tissues. Although it has high oncogenic activities, CENP-W also induces cell apoptosis when overexpressed in certain cell lines. After it was revealed that CENP-W forms a stable heterodimer with CENP-T and is localized in kinetochores during mitosis, CENP-W become recognized as a new member of the inner centromere protein complex. Subsequent studies have also shown that CENP-T-W-S-X forms a unique centromeric nucleosome-like heterotetramer structure which binds to and supercoils DNA.

Figure 1. A genomic structure of the CENPW gene.
CENPW (centromere protein W)  

As a nucleolus-associated protein, CENP-W may play critical role in the formation of functional kinetochore, possibly by facilitating the recruitment of other centromeric components during interphase, which is required for proper chromosome segregation during mitosis.

**Homology**  
According to NCBI-HomoloGene:  
- Pan troglodytes (chimpanzee): centromere protein W (NP_001012525.1, 88 aa)  
- Macaca mulatta (Rhesus monkey): centromere protein W (XP_001107034.2, 88 aa)  
- Canis lupus familiaris (dog): centromere protein W-like (XP_003638832.1, 88 aa)  
- Bovista (cattle): centromere protein W (NP_001104731.1, 88 aa)  
- Mus musculus (house mouse): centromere protein W (NP_001103217.1, 86 aa)  
- Rattus norvegicus (Norway rat): centromere protein W (XP_001070657.1, 86 aa).

**Mutations**

Note  
Over expressed in various cancer tissues; notably high in the ovary (6.3-fold), liver (6.0), lung (4.9), and pancreas (3.8).

**Implicated in**

**Various human cancers**

**Oncogenesis**  
CENP-W has been found to be upregulated in several tumor tissues. When the expression level of CENP-W was examined by DNA chip microarray and RT-PCR in tumors, six tissues (ovary, liver, lung, pancreas, colon, and stomach) showed high-fold increases in expression profiles. Also, CENP-W-transformed NIH3T3 cells exhibited exceptionally prominent cancerous phenotypes in vitro as well as in vivo tumor forming assays.

**References**


This article should be referenced as such: