

Gene Section

Mini Review

WDR77 (WD repeat domain 77)

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Identity

Other names: HKMT1069, MEP50, MGC2722, Nbla10071, RP11-552M11.3, p44, p44/Mep50

HGNC (Hugo): WDR77

Location: 1p13.2

DNA/RNA

Description

Spans 9.3kb/ 7.9kb; 10 exons.

Transcription

2428/ 1029 nucleotides mRNA.

Protein

Description

342 amino acids. 44 kDa protein. 5 WD repeats (Hosohata et al., 2003).

Expression

p44 is expressed in heart, skeletal muscle, spleen, thymus, prostate, testis, pancreas, and uterus (Hosohata et al., 2003).

In adult prostate, p44 is expressed as nuclear protein in glandular epithelial cells and not in stromal cells (Zhou et al., 2006).

In testis, p44 expression is seen in germ cells and Leydig cells, but not expressed in peritubular myocytes and Sertoli's cells (Liang et al., 2006).

Localisation

p44 has both nuclear and cytoplasmic localization patterns (Zhou et al., 2006; Liang et al., 2006; Peng et al., 2008). In benign prostate and testicular cells,

p44 is found predominantly in the nucleus. In prostate cancer and malignant testicular cells (seminomas and leydig cell tumor), p44 is found in the cytoplasm. The p44 cytoplasmic translocation may be an indicative marker of cancer in these tissues.

Function

p44 interacts with androgen receptor and acts as a positive coactivator for androgen-dependent AR transactivation (Hosohata, 2003). Nuclear p44 causes an androgen-dependent G1 arrest growth inhibition in prostate cells expressing androgen receptor (Zhou et al., 2006; Peng et al., 2008). Cytoplasmic and nuclear p44 may have opposite functions, as introduction of p44 to the cytoplasm accelerates growth (Peng et al., 2008).

p44 is part of the PRMT5 (protein arginine methyl transferase 5) complex important for methylome activity (Hosohata et al., 2003; Friesen et al., 2002). p44 interacts with FCP1 phosphatase (Licciardo et al., 2002) and histone H2A (Furuno et al., 2006).

Homology

WD repeats commonly seen for multiple protein interactions.

Mutations

Note

Unknown.

Implicated in

Androgen-dependent prostate cancer

Disease

In androgen-dependent prostate cancer p44 is found predominantly in the cytoplasm, as opposed to nuclear

localization in benign tissue (Zhou et al., 2006). Translocation from the nucleus in benign cells to the cytoplasm is strongly associated with prostate tumorigenesis (Zhou et al., 2006; Peng et al., 2008). Cytoplasmic expressed p44 also leads to increased growth in androgen dependent prostate cell line LNCaP (Peng et al., 2008).

Androgen-independent prostate cancer

Disease

In androgen-independent cancers p44 is found both in the nucleus and the cytoplasm (Peng et al., 2008). P44 may be able to serve as a diagnostic marker of androgen-independent prostate cancer.

Testicular cancer

Disease

Testicular tumor cells have an increased cytoplasmic localization of p44 similar to the pattern observed in prostate cancer (Jiang et al., 2006). This is also similar to the pattern seen in the germ cells of fetal testis that express cytoplasmic p44. P44 is predominantly found in the nucleus of benign testicular cells and adult testis germ cells. Translocation of p44 to the cytoplasm in testis cells shows an association with tumorigenesis.

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