

Uniprot ID: O95551

Protein name: TYDP2_HUMAN

Full name: Tyrosyl-DNA phosphodiesterase 2

Protein existence: evidence at protein level

Function: DNA repair enzyme that can remove a variety of covalent adducts from DNA through hydrolysis of a 5'-phosphodiester bond, giving rise to DNA with a free 5' phosphate. Catalyzes the hydrolysis of dead-end complexes between DNA and the topoisomerase 2 (TOP2) active site tyrosine residue. Hydrolyzes 5'-phosphoglycolates on protruding 5' ends on DNA double-strand breaks (DSBs) due to DNA damage by radiation and free radicals. The 5'-tyrosyl DNA phosphodiesterase activity can enable the repair of TOP2-induced DSBs without the need for nuclease activity, creating a 'clean' DSB with 5'-phosphate termini that are ready for ligation. Has preference for single-stranded DNA or duplex DNA with a 4 base pair overhang as substrate. Has also 3'-tyrosyl DNA phosphodiesterase activity, but less efficiently and much slower than TDP1. Constitutes the major if not only 5'-tyrosyl-DNA phosphodiesterase in cells. Also acts as a 5'-tyrosyl-RNA phosphodiesterase following picornavirus infection: its activity is hijacked by picornavirus and acts by specifically cleaving the protein-RNA covalent linkage generated during the viral genomic RNA replication steps of a picornavirus infection, without impairing the integrity of viral RNA. Also acts as an adapter by participating in the specific activation of MAP3K7/TAK1 in response to TGF-beta: associates with components of the TGF-beta receptor-TRAF6-TAK1 signaling module and promotes their ubiquitination dependent complex formation. Involved in non-canonical TGF-beta induced signaling routes. May also act as a negative regulator of ETS1 and may inhibit NF-kappa-B activation. Acts as a regulator of ribosome biogenesis following stress.

Subcellular location: Nucleus

Nucleus > PML body

Nucleus > Nucleolus

Cytoplasm

NOTE: Localizes to nucleolar cavities following stress; localization to nucleolus is dependent on PML protein. In case of infection by picornavirus, relocalizes to cytoplasmic sites distinct from those containing viral proteins associated with RNA replication or encapsidation.

Tissue specificity: Widely expressed.

TDP2-2

Three antibodies: TDP2-1, TDP2-2 and TDP2-3 were tested. TDP2-2 was selected for full protein profiling.

TDP2-2 (CAB073398)

OK



Immunohistochemistry

IHC protocol: HIER pH 6, Dilution 1:18000

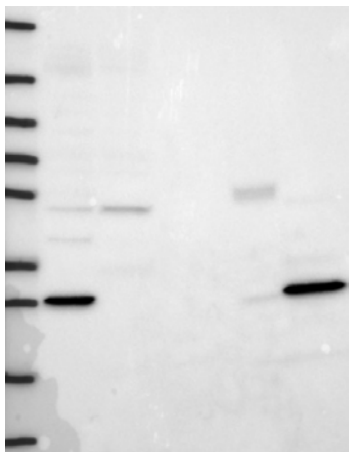
IHC test staining: cytoplasmic and nuclear staining in glandular cells of gastrointestinal tract.

IHC Annotators comments

Renal tubules and subset of cells in gastrointestinal tract showed strong cytoplasmic and nuclear positivity. Airways epithelium, salivary gland, esophagus, adrenal and germinal center cells of tonsil showed moderate nuclear positivity. Remaining normal tissues were weakly stained or negative.

Few colorectal cancers showed moderate to strong cytoplasmic and nuclear positivity. Rare cases of melanoma, prostate, thyroid, urothelial and testis cancers showed moderate nuclear positivity. Remaining cancers were weakly stained or negative.

Pending Immunofluorescence



Western blot

WB Size markers (kDa): 250, 130, 95, 72, 55, 36, 28, 17, 10

WB Lanes: Marker(1), RT-4(2), U251 MG(3), Plasma(4), Liver(5), Tonsil(6)

WB Target weight (kDa): 41, 34.

WB Validation: Supportive (Band of predicted size in kDa (+/-20%) with additional bands present)