



LD Biopharma, Inc.
7384 Trade Street, Suite B
San Diego, CA 92121
Tel: 858-876-8266
<http://www.ldbiopharma.com>

- PRODUCT DATA SHEET -

Name of Product: Recombinant Human PTEN Protein
Catalog Number: hRP-2462
Manufacturer: LD Biopharma, Inc.

Introduction

As tumor suppressor, human PTEN protein acts as a dual-specificity protein phosphatase, dephosphorylating tyrosine-, serine- and threonine-phosphorylated proteins. It also acts as a lipid phosphatase, removing the phosphate in the D3 position of the inositol ring from phosphatidylinositol 3,4,5-trisphosphate, phosphatidylinositol 3,4-diphosphate, phosphatidylinositol 3-phosphate and inositol 1,3,4,5-tetrakisphosphate with order of substrate preference in vitro $\text{PtdIns(3,4,5)P3} > \text{PtdIns(3,4)P2} > \text{PtdIns3P} > \text{Ins(1,3,4,5)P4}$. The lipid phosphatase activity is critical for its tumor suppressor function. Antagonizes the PI3K-AKT/PKB signaling pathway by dephosphorylating phosphoinositides and thereby modulating cell cycle progression and cell survival. The unphosphorylated form of PTEN cooperates with AIP1 to suppress AKT1 activation. Dephosphorylates tyrosine-phosphorylated focal adhesion kinase and inhibits cell migration and integrin-mediated cell spreading and focal adhesion formation. It plays a role as a key modulator of the AKT-mTOR signaling pathway controlling the tempo of the process of newborn neurons integration during adult neurogenesis, including correct neuron positioning, dendritic development and synapse formation. PTEN may be a negative regulator of insulin signaling and glucose metabolism in adipose tissue. The nuclear monoubiquitinated form possesses greater apoptotic potential, whereas the cytoplasmic nonubiquitinated form induces less tumor suppressive ability. In motile cells, it suppresses the formation of lateral pseudopods and thereby promotes cell polarization and directed movement. Anti-PTEN auto-antibodies have been found in sera from patients with autoimmune diseases and cancer patients.

Full-length human PTEN (402aa) gene was constructed with codon optimization gene synthesis and expressed with a T7-His-TEV cleavage site Tag (29aa) fusion at its N-terminal in E.coli as inclusion bodies. The final product was refolded using our unique “temperature shift inclusion body refolding” technology and chromatographically purified.

Gene Symbol: PTEN (10q23del; BZS; CWS1; DEC; GLM2; MHAM)
Accession Number: NP_003520
Species: Human
Size: 20 µg / Vial



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Composition: 0.2 mg/ml, sterile-filtered, in 20 mM pH 8.0 Tris-HCl Buffer, with proprietary formulation of NaCl, KCl, EDTA, Sucrose and DTT.

Storage: In Liquid. Keep at -80°C for long term storage. Product is stable at 4 °C for at least 7 days.

Key References

Ma H, et al., *The melatonin-MT1 receptor axis modulates tumor growth in PTEN-mutated gliomas*. Biochem. Biophys. Res. Commun. 496 (4), 1322-1330 (2018)

Kostyuk SV, et al., *Symmetric dimeric bisbenzimidazoles DBP(n) reduce methylation of RARB and PTEN while significantly increase methylation of rRNA genes in MCF-7 cancer cells*. PLoS ONE 13 (1), e0189826 (2018)

Wang P, et al., *miR-21 Inhibitors Modulate Biological Functions of Gastric Cancer Cells via PTEN/PI3K/mTOR Pathway*. DNA Cell Biol. 37 (1), 38-45 (2018)

Riquelme SA, et al., *Cystic Fibrosis Transmembrane Conductance Regulator Attaches Tumor Suppressor PTEN to the Membrane and Promotes Anti Pseudomonas aeruginosa Immunity*. Immunity 47 (6), 1169-1181 (2017)

Hopkins BD, et al., *A secreted PTEN phosphatase that enters cells to alter signaling and survival*. Science 341 (6144), 399-402 (2013)

Applications

1. May be used for in vitro PTEN mediated cell signaling pathway regulation study for various cells by intracellular delivery of this protein with ProFectin reagents.
2. May be used for mapping protein-protein interaction.
3. May be used as specific substrate protein for kinase, and ubiquitin (Sumo pathway) related enzyme functional screening assays.
4. May serve as auto-antibodies detection reagent, which will react with sera of some auto-immuno-diseases's or cancer patients.
5. As Immunogen for specific antibody production.

Quality Control

Purity: > 90% by SDS-PAGE.



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Recombinant Protein Sequence

MASMTGGQQMGRGHHHHHENLYFQGGEFTAI IKEIVSRNKRRYQEDGF~~DL~~DLTYIYPNIIAMG
FPAERLEGVYRNNIDDVVRFLDSKHKNHYKIYNLCAERHYDTAKFNCRVAQYPFEDHNPPQLEL
IKPFCEDLDQWLSEDDNHVAAIHCKAGKGRTGVMICAYLLHRGKFLKAQEALDFYGEVTRDKK
GVTIPSQRRYVYYYSYLLKNHLDYRPVALLFHKMMFETIPMFSGGTCNPQFVVCQLKVKIYSSN
SGPTRREDKFMYFEFPQPLPVCGDIKVEFFHKQNKMLKKDKMFHFVWNTFFIPGPEETSEKVEN
GSLCDQEIDSI CSIERADNDKEYLVLT~~LT~~TKNDLDKANKDKANRYFSPNFVKVLYFTKTVEEPSN
PEASSSTSVTPDVSDNEPDHYRYS~~DT~~TDSDPENEPFDEDQHTQITKV