Saint Louis, Missouri 63103 USA
Telephone (800) 325-5832 (314) 771-5765
Fax (314) 286-7828
email: techserv@sial.com
sigma-aldrich.com

ProductInformation

MONOCLONAL ANTI-PTEN
CLONE PTN-18
Purified Mouse Immunoglobulin

Product Number **P 3487**

Product Description

Monoclonal Anti-PTEN (mouse IgG2a isotype) is derived from the PTN-18 hybridoma produced by the fusion of mouse myeloma cells and splenocytes from a BALB/c mouse immunized with a synthetic peptide corresponding to the C-terminus (a.a. 386-403) of rat PTEN, conjugated to KLH. The isotype is determined using Sigma ImmunoType™ Kit (Sigma ISO-1) and by a double diffusion immunoassay using Mouse Monoclonal Antibody Isotyping Reagents (Sigma ISO-2).

Monoclonal Anti-PTEN recognizes an epitope within amino acids 386-403 of rat PTEN. This epitope is common to the human, rat and mouse PTEN molecule. The antibody may be used for ELISA, immunoblotting (approx. 55 kDa) and immunocytochemistry (4% paraformaldehyde-0.5% Triton X-100 fixation). Reactivity has been observed with human, rat and mouse PTEN.

PTEN (Phosphatase and tensin homolog deleted on chromosome ten), also called MMAC (mutated in multiple advanced cancers), is a tumor suppressor gene implicated in wide variety of human cancers, particularly prevalent in glioblastomas, endometrial carcinomas, advanced prostate cancers and breast cancers.[1-8] In addition, germline mutations in PTEN give rise to Cowden disease, an autosomal-dominant syndrome, characterized by multiple hamartomas (overgrowths of normal mature tissue within their normal organ or tissue of origin) and increased risk for development of breast, thyroid and brain tumors.[8,9]

The *PTEN* gene encodes a 403 amino acid protein (apparent MW ~56 kDa), originally described as a dual-specificity protein phosphatase.[10] However, considerable evidence indicate that PTEN is a lipid phosphatase. Its main substrates are inositol phospholipids, such as phosphatidylinositol(3,4,5)-phosphate (PIP_3), generated by the activation of phosphatidylinositol-3-kinase (PI3-kinase).[11,12] The lipid phosphatase activity of PTEN is essential for its tumor suppressor activity, and cells with reduced or no PTEN activity have increased levels of PIP_3.[12] Tumor suppression by PTEN is associated with its ability to induce growth arrest and apoptosis.

Biochemical and functional evidence indicate that PTEN is a major negative regulator of the PI3-kinase-Akt/PKB signaling pathway, controlling cell proliferation and survival.[9,12-15] *mPTEN*-mutant embryos display extensive proliferation *in vitro* and *in vivo*.[13] Cells lacking functional PTEN, exhibit decreased sensitivity to cell death in response to a variety of apoptotic stimuli, accompanied by constitutively elevated activity of Akt/PKB.[13] Expression of functional PTEN in mutant cells leads to reduced, normal levels of activated Akt/PKB, while overexpression of Akt/PKB overcomes PTEN-induced cell death.[12-14] These activities are dependent upon PTEN ability to dephosphorylate inositol phospholipids and thereby block PI3-kinase and Akt/PKB signaling. Monoclonal antibody reacting specifically with PTEN is a useful tool for the study of the molecular mechanisms by which PTEN can exert a regulation of signaling pathways, controlling cell proliferation and survival.

Reagent

Monoclonal Anti-PTEN is supplied as a solution in 0.01 M phosphate buffered saline pH 7.4, containing 1% bovine serum albumin and 15 mM sodium azide as a preservative.

Antibody Concentration: Approx. 1 mg/ml.

Precautions and Disclaimer

Due to the sodium azide content a material safety sheet (MSDS) for this product has been sent to the attention of the safety officer of your institution. Consult the MSDS for information regarding hazards and safe handling practices.

Storage/Stability

For continuous use, store at 2 °C to 8 °C for up to one month. For extended storage, freeze in working aliquots. Repeated freezing and thawing is not recommended. Storage in "frost-free" freezers is not recommended. If slight turbidity occurs upon prolonged storage, clarify the solution by centrifugation before use. Working dilution samples should be discarded if not used within 12 hours.

Product Profile
A working concentration of 5 to10 µg/ml is determined by immunoblotting using a whole rat brain homogenate.

Note: In order to obtain best results in different techniques and preparations we recommend determining optimal working concentration by titration test.

References

1. Li, J., et al., Science, **275**, 1943-1947 (1997).
2. Steck, P.A., et al., Nature Genet., **15**, 356-362 (1997).
3. Tashiro, H., et al., Cancer Res., **57**, 3935-3940 (1997).
4. Cairns, P., et al., Cancer Res., **57**, 4997-5000 (1997).
5. Rhei, E., et al., Cancer Res., **57**, 3657-3659 (1997).
6. Wang, S.I., et al., Cancer Res., **57**, 4183-4186 (1997).
7. Rasheed, B.K.A., et al., Cancer Res., **57**, 4187-4190 (1997).
8. Cantley, L.C., and Neel, B.G., Proc. Natl. Acad. Sci. USA, **96,** 4240-4245 (1999).
9. Liaw, D., et al., Nature Genet., **16**, 64-67 (1997).
10. Myers, M.P., et al., Proc. Natl. Acad. Sci. USA, **94**, 9052-9057 (1997).
11. Maehama, T., and Dixon, J.E., J. Biol. Chem., **273**, 13375-13378 (1998).
12. Myers, M.P., et al., Proc. Natl. Acad. Sci. USA, **95,** 13513-13518 (1998).
13. Stambolic, V., et al., Cell, **95,** 29-39 (1998).
14. Li, J., et al., Cancer Res., **58**, 5667-5672 (1998).
15. Wu, X., et al., Proc. Natl. Acad. Sci. USA, **95**, 15587-15591 (1998).

lpg 7/01