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ProductInformation

Anti-Tuberin (IA-22)
Developed in Rabbit
Affinity Isolated Antibody

Product Number **T 9574**

Product Description

Anti-Tuberin (IA-22) is developed in rabbit using as immunogen a synthetic peptide corresponding to amino acid residues 1463-1484 of human tuberin with N-terminal added cysteine, conjugated to KLH. The corresponding sequence differs by two amino acids in rat and mouse. The antibody is affinity-purified using the immunizing peptide immobilized on agarose.

Anti-Tuberin (IA-22) recognizes human, rat, and mouse tuberin by immunoblotting (180-200 kDa) and immunoprecipitation. Detection of the tuberin band by immunoblotting is specifically inhibited with the immunizing peptide.

Tuberin is the protein product of the tumor suppressor gene TSC2.[1] Hamartin, the product of the TSC1 tumor suppressor gene, contains two coiled-coil regions that have been shown to mediate its binding to tuberin.[2, 3] Tuberin and hamartin are involved in the regulation of cell cycle, cell growth, cell differentiation, cell adhesion, and vesicular trafficking.[4] Mutations in either the TSC1 or the TSC2 gene are responsible for tuberous sclerosis complex (TSC), an autosomal dominant hereditary disease characterized by mental retardation, seizures, and benign tumors (hamartomas) in multiple organs including the kidney, brain, heart and skin.[5]

Tuberin is widely expressed in mammalian cell lines and tissues. It co-localizes with hamartin in most tissues and cell types.[6] Tuberin is found in cytosolic, microsomal, cytoskeletal, and vesicular fractions, and in certain cells it is also localized to the nucleus.[7, 8] Tuberin has a GTPase activating protein homology (GAP) domain that was recently reported to be involved in the regulation of the small GTPase Rheb both *in vitro* and *in vivo*.[9]

Tuberin forms together with hamartin a functional cytoplasmic complex that inhibits growth by inhibiting phosphorylation of S6K and 4EBP, probably through their upstream modulator mammalian target of rapamycin (mTOR).[10]

Tuberin phosphorylation is required for complex formation as well for its interaction with several isoforms of the regulatory 14-3-3 protein.[11] Tuberin and hamartin are involved in the phosphoinositide 3-kinase/Akt signal transduction pathway.[4] Phosphorylation by Akt and mitogenic factors abrogates hamartin-tuberin suppressor activity by inducing proteasome-mediated degradation of both proteins.[12]

Reagent

Anti-Tuberin (IA-22) 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.

Antibody Concentration: 0.6-0.8 mg/ml

Precautions and Disclaimer

Due to the sodium azide content, a material safety data 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 2-8 °C for up to one month. For prolonged storage, freeze in working aliquots at −20 °C. Repeated freezing and thawing is not recommended. Storage in frost-free freezers is also not recommended. If slight turbidity occurs upon prolonged storage, clarify the solution by centrifugation before use. Working dilutions should be discarded if not used within 12 hours.

Product Profile

By immunoblotting, a working antibody concentration of 0.1-0.2 µg/ml is recommended using whole extracts of rat brain and mouse NIH-3T3 cells.

5-10 µg of the antibody immunoprecipitates tuberin from 0.5 mg of RIPA extract of human MCF-7 cells.

Note: In order to obtain the best results using various techniques and preparations, we recommend determining the optimal working dilutions by titration.

References

1. Wienecke, R., et al., J. Biol. Chem., **270**, 16409-16414 (1995).
2. The European Chromosome 16 Tuberous Sclerosis Consortium, Cell, **75**, 1305-1315 (1993).
3. van Slegtenhorst, M., et al., Hum. Mol. Genet., **7** (6),1053-1057 (1998).
4. Dan, H.C., et. al., J. Biol. Chem., **277**, 35364-35370 (2002).
5. Gomez, M.R., (ed.) in: Tuberous Sclerosis, (Raven Press, New York, 1988).
6. Johnson, M.W., et al., Modern. Pathol., **14**, 202-210 (2001).
7. Yamamoto, Y., et al., Arch. Biochem. Biophys., **404**, 210-217 (2002).
8. Wei, J., et al., Modern. Pathol., **15**, 862-869 (2001).
9. Tee, A.R., et al., Curr. Biol., **13**, 1259-1268 (2003).
10. Krymskaya, V.P., Cell Signal., **15**, 729-739 (2003).
11. Nellist, M., et al., J. Biol. Chem., **277**, 39417-39424 (2002).
12. Aicher, L.D., et al., J. Biol. Chem., **276**, 21017-21021 (2001).
13. Plas, D.R., and Thompson, C.B., J. Biol. Chem., **278**, 12361-12366 (2003).

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