

Hamartin/TSC1 (1B2) Mouse mAb

✓ 100 µl
(10 Western mini-blot)

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rev. 08/21/07

This product is for *in vitro* research use only and is not intended for use in humans or animals.

Applications	Species Cross-Reactivity*	Molecular Wt.	Source
W	H, M, R	150-170	Mouse

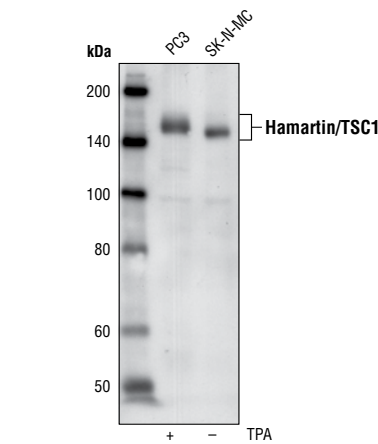
Background: Tuberous sclerosis complex (TSC) is an autosomal dominant disorder that causes symptoms including hamartomas in brain, kidney, heart, lung and skin (1). The tumor suppressor genes TSC1 and TSC2 encode hamartin and tuberlin, respectively (2,3). Hamartin and tuberlin form a functional complex and are involved in numerous cellular activities such as vesicular trafficking, regulation of the G1 phase of the cell cycle, steroid hormone regulation, Rho activation and anchoring neuronal intermediate filaments to the actin cytoskeleton (4-9). Cells lacking hamartin or tuberlin display phosphorylation of S6 kinase and S6 resulting in negative regulation of S6 kinase. Furthermore, the combination of genetic, biochemical and cell-biological studies demonstrate that the tuberlin: hamartin complex functions as a GTPase-activating protein for the Ras-related small G protein Rheb and thus inhibits targets of rapamycin including mTOR (10). Hamartin is phosphorylated by CDK1 (cdc2) at Thr417, Ser584 and Thr1047 in cells in G2/M phase of the cell cycle (11).

Specificity/Sensitivity: Hamartin/TSC1 (1B2) Mouse mAb detects endogenous levels of total hamartin protein.

Source/Purification: Monoclonal antibody is produced by immunizing mice with a recombinant protein from the central region of human hamartin.

Selected Application References:

Murthy, V. et al. (2000) Similarities and differences in the subcellular localization of hamartin and tuberlin in the kidney. *Am J Physiol Renal Physiol.* 278, 737-746.
Applications: W, IP, IF-P.



Western blot analysis of extracts from PC3 and SK-N-MC cells using Hamartin/TSC1 (1B2) Mouse mAb.

Background References:

- (1) Sparagana, S.P. and Roach, E.S. (2000) *Curr. Opin. Neurol.* 13, 115-119.
- (2) van Sleightenhorst, M. et al. (1997) *Science* 277, 805-808.
- (3) No authors listed. (1993) *Cell* 75, 1305-1315.
- (4) Plank, T.L. et al. (1998) *Cancer Res.* 58, 4766-4770.
- (5) Xiao, G. et al. (1997) *J. Biol. Chem.* 272, 6097-6100.
- (6) Tapon, N. et al. (2001) *Cell* 105, 345-355.
- (7) Henry, K.W. et al. (1998) *J. Biol. Chem.* 273, 20535-20539.
- (8) Lamb, R.F. et al. (2000) *Nat. Cell Biol.* 2, 281-287.
- (9) Haddad, L.A. et al. (2002) *J. Biol. Chem.* 277, 44180-44186.
- (10) Manning, B.D. and Cantley, L.C. (2003) *Trends Biochem Sci.* 28, 573-576.
- (11) Astrinidis, A. et al. (2003) *J. Biol. Chem.* 278, 51372-51379.

IMPORTANT: For Western blots, incubate membrane with diluted antibody in 5% w/v nonfat dry milk, 1X TBS, 0.1% Tween-20 at 4°C with gentle shaking, overnight.

Applications Key: W—Western IP—Immunoprecipitation IHC—Immunohistochemistry IC—Immunocytochemistry IF—Immunofluorescence
Species Cross-Reactivity Key: H—human M—mouse R—rat Hm—hamster Mk—monkey Mi—mink C—chicken X—Xenopus
Species enclosed in parentheses are predicted to react based on 100% sequence homology.

Storage: Supplied in 10 mM sodium HEPES (pH 7.5), 150 mM NaCl, 100 µg/ml BSA, 50% glycerol and less than 0.02% sodium azide. Store at -20°C. Do not aliquot the antibody.

*Species cross-reactivity is determined by Western blot.

Recommended Antibody Dilutions:

Western Blotting 1:1000

Companion Products:

Hamartin/TSC1 Antibody #4906
Phospho-Tuberin/TSC2 (Thr1462) Antibody #3611
Tuberlin/TSC2 Antibody #3612
Phospho-Tuberin/TSC2 (Tyr1571) Antibody #3614
Phospho-Tuberin/TSC2 (Ser939) Antibody #3615
Phospho-Tuberin/TSC2 (Ser1254) Antibody #3616
PhosphoPlus® Akt (Ser473) Antibody Kit #9270
Phototope®-HRP Western Blot Detection System, Anti-mouse IgG, HRP-linked Antibody #7072
Anti-mouse IgG, HRP-linked Antibody #7076
Biotinylated Protein Ladder #7727
20X LumiGLO® Reagent and 20X Peroxide #7003

F—Flow cytometry E—ELISA D—DELFIATM

Z—zebra fish B—bovine All—all species expected

Western Immunoblotting Protocol (Primary Antibody Incubation in Milk)

For Western blots, incubate membrane with diluted antibody in 5% w/v nonfat dry milk, 1X TBS, 0.1% Tween-20 at 4°C with gentle shaking, overnight.

A Solutions and Reagents

NOTE: Prepare solutions with Milli-Q or equivalently purified water.

- 1X Phosphate Buffered Saline (PBS)
- 1X SDS Sample Buffer:** 62.5 mM Tris-HCl (pH 6.8 at 25°C), 2% w/v SDS, 10% glycerol, 50 mM DTT, 0.01% w/v bromophenol blue or phenol red
- Transfer Buffer:** 25 mM Tris base, 0.2 M glycine, 20% methanol (pH 8.5)
- 10X Tris Buffered Saline (TBS):** To prepare 1 liter of 10X TBS: 24.2 g Tris base, 80 g NaCl; adjust pH to 7.6 with HCl (use at 1X).
- Nonfat Dry Milk (weight to volume [w/v])
- Blocking Buffer:** 1X TBS, 0.1% Tween-20 with 5% w/v nonfat dry milk; for 150 ml, add 15 ml 10X TBS to 135 ml water, mix. Add 7.5 g nonfat dry milk and mix well. While stirring, add 0.15 ml Tween-20 (100%).
- Wash Buffer:** 1X TBS, 0.1% Tween-20 (TBS/T)
- Primary Antibody Dilution Buffer:** 1X TBS, 0.1% Tween-20 with 5% nonfat dry milk; for 20 ml, add 2 ml 10X TBS to 18 ml water, mix. Add 1.0 g nonfat dry milk and mix well. While stirring, add 20 µl Tween-20 (100%).
- Phototope®-HRP Western Blot Detection System #7072:** Includes biotinylated protein ladder, secondary anti-mouse (#7076) antibody conjugated to horseradish peroxidase (HRP), anti-biotin antibody conjugated to HRP, LumiGLO® chemiluminescent reagent and peroxide.
- Prestained Protein Marker, Broad Range (Premixed Format) #7720
- Biotinylated Protein Ladder Detection Pack #7727
- Blotting Membrane:** This protocol has been optimized for nitrocellulose membranes, which CST recommends. PVDF membranes may also be used.

B Protein Blotting

A general protocol for sample preparation is described below.

- Treat cells by adding fresh media containing regulator for desired time.
- Aspirate media from cultures; wash cells with 1X PBS; aspirate.
- Lyse cells by adding 1X SDS sample buffer (100 µl per well of 6-well plate or 500 µl per plate of 10 cm diameter plate). Immediately scrape the cells off the plate and transfer the extract to a microcentrifuge tube. Keep on ice.
- Sonicate for 10–15 seconds to shear DNA and reduce sample viscosity.
- Heat a 20 µl sample to 95–100°C for 5 minutes; cool on ice.
- Microcentrifuge for 5 minutes.
- Load 20 µl onto SDS-PAGE gel (10 cm x 10 cm).

NOTE: CST recommends loading prestained molecular weight marker (#7720, 10 µl/lane) to verify electrotransfer and biotinylated protein ladder (#7727, 10 µl/lane) to determine molecular weights.

- Electrotransfer to nitrocellulose or PVDF membrane.

C Membrane Blocking and Antibody Incubations

NOTE: Volumes are for 10 cm x 10 cm (100 cm²) of membrane; for different sized membranes, adjust volumes accordingly.

- (Optional) After transfer, wash nitrocellulose membrane with 25 ml TBS for 5 minutes at room temperature.
- Incubate membrane in 25 ml of blocking buffer for 1 hour at room temperature.
- Wash three times for 5 minutes each with 15 ml of TBS/T.
- Incubate membrane and primary antibody (at the appropriate dilution) in 10 ml primary antibody dilution buffer with gentle agitation overnight at 4°C.
- Wash three times for 5 minutes each with 15 ml of TBS/T.
- Incubate membrane with HRP-conjugated secondary antibody (1:2000) and HRP-conjugated anti-biotin antibody (1:1000) to detect biotinylated protein markers in 10 ml of blocking buffer with gentle agitation for 1 hour at room temperature.
- Wash three times for 5 minutes each with 15 ml of TBS/T.

D Detection of Proteins

- Incubate membrane with 10 ml LumiGLO® (0.5 ml 20X LumiGLO®, 0.5 ml 20X Peroxide and 9.0 ml Milli-Q water) with gentle agitation for 1 minute at room temperature.

NOTE: LumiGLO® substrate can be further diluted if signal response is too fast.

- Drain membrane of excess developing solution (do not let dry), wrap in plastic wrap and expose to x-ray film. An initial 10-second exposure should indicate the proper exposure time.

NOTE: Due to the kinetics of the detection reaction, signal is most intense immediately following LumiGLO® incubation and declines over the following 2 hours.