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Rheb Antibody

Catalog # ASC10314

Product Information

Application	WB, IF, E, IHC-P
Primary Accession	Q15382
Other Accession	AAH16155, 16740561
Reactivity	Human, Mouse, Rat
Host	Rabbit
Clonality	Polyclonal
Isotype	IgG
Calculated MW	20497
Concentration (mg/ml)	1 mg/mL
Conjugate	Unconjugated
Application Notes	Rheb antibody can be used for the detection of Rheb by Western blot at 1 to 4 g/mL. Antibody can also be used for immunohistochemistry starting at 2 g/mL. For immunofluorescence start at 20 g/mL.

Additional Information

Gene ID	6009
Other Names	Rheb Antibody: RHEB2, RHEB2, GTP-binding protein Rheb, Ras homolog enriched in brain, Ras homolog enriched in brain
Target/Specificity	RHEB;
Reconstitution & Storage	Rheb antibody can be stored at 4°C for three months and -20°C, stable for up to one year. As with all antibodies care should be taken to avoid repeated freeze thaw cycles. Antibodies should not be exposed to prolonged high temperatures.
Precautions	Rheb Antibody is for research use only and not for use in diagnostic or therapeutic procedures.

Protein Information

Name	RHEB {ECO:0000303|PubMed:8543055, ECO:0000312|HGNC:HGNC:10011}
Function	Small GTPase that acts as an allosteric activator of the canonical mTORC1 complex, an evolutionarily conserved central nutrient sensor that stimulates anabolic reactions and macromolecule biosynthesis to promote cellular biomass generation and growth (PubMed:12172553, PubMed:12271141, PubMed:12842888, PubMed:12869586, PubMed:12906785, PubMed:15340059, PubMed:15854902, PubMed:16098514, PubMed:20381137, PubMed:22819219, PubMed:24529379, PubMed:29416044, PubMed:32470140, PubMed:33157014, PubMed:25816988). In response to nutrients, growth factors or amino acids,

	specifically activates the protein kinase activity of MTOR, the catalytic component of the mTORC1 complex: acts by causing a conformational change that allows the alignment of residues in the active site of MTOR, thereby enhancing the phosphorylation of ribosomal protein S6 kinase (RPS6KB1 and RPS6KB2) and EIF4EBP1 (4E-BP1) (PubMed:29236692, PubMed:33157014). RHEB is also required for localization of the TSC-TBC complex to lysosomal membranes (PubMed:24529379). In response to starvation, RHEB is inactivated by the TSC-TBC complex, preventing activation of mTORC1 (PubMed:24529379, PubMed:33157014). Has low intrinsic GTPase activity (PubMed:15340059).
Cellular Location	Endomembrane system; Lipid-anchor; Cytoplasmic side. Lysosome membrane; Lipid-anchor; Cytoplasmic side. Golgi apparatus membrane; Lipid-anchor; Cytoplasmic side. Endoplasmic reticulum membrane; Lipid-anchor; Cytoplasmic side. Cytoplasm, cytosol. Note=Farnesylation is required for recruitment to lysosomal membranes, where it activates the mTORC1 complex.
Tissue Location	Ubiquitous (PubMed:8543055). Highest levels observed in skeletal and cardiac muscle (PubMed:8543055)

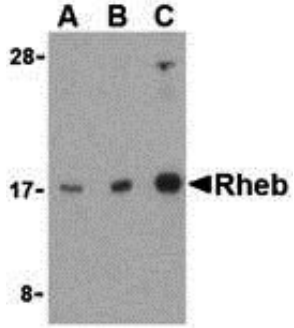
Background

Rheb Antibody: Rheb (Ras homolog enriched in brain) is an evolutionarily conserved member of the Ras family of small GTP-binding proteins originally found to be rapidly induced by synaptic activity in the hippocampus following seizure. While it is expressed at relatively high levels in the brain, Rheb is widely expressed in other tissues and may be induced by growth factor stimulation. Similar to other family members, Rheb triggers activation of the Raf-MEK-MAPK pathway. Biochemical and genetic studies demonstrate that Rheb has an important role in regulating the insulin/Target of rapamycin (TOR) signaling pathway. TOR is a serine/threonine protein kinase that acts as a sensor for ATP and amino acids, balancing the availability of nutrients with protein translation and cell growth. A dimeric protein complex termed TSC1/TSC2 indirectly inhibits TOR activity by inhibiting Rheb via the GAP activity of TSC2.

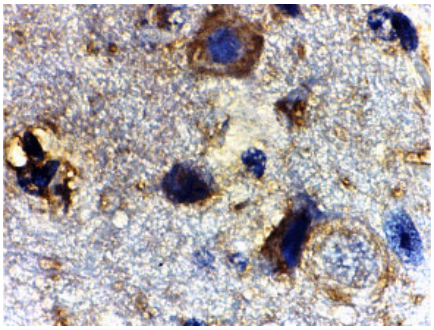
References

Yamagata K, Sanders LK, Kaufman WE, et al. rheb, a growth factor- and synaptic activity-regulated gene, encodes a novel Ras-related protein. J. Biol. Chem. 1994; 269:16333-9.
Yee WM and Worley PF. Rheb interacts with Raf-1 kinase and may function to integrate growth factor- and protein kinase A-dependent signals. Mol. Cell. Biol. 1997; 17:921-3.
Inoki K, Li Y, Xu T, et al. Rheb GTPase is a direct target of TSC2 GAP activity and regulates mTOR signaling. Genes Dev. 2003; 17:1829-34.
Stocker H, Radimerski T, Schindelholz B, et al. Rheb is an essential regulator of S6K in controlling cell growth in Drosophila. Nat. Cell Biol. 2003; 5:559-65.

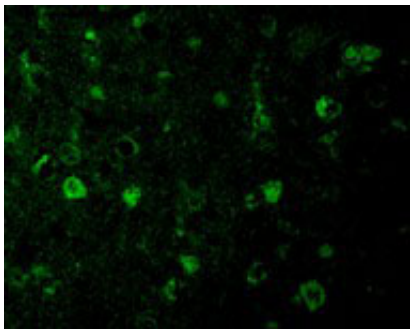
Images



Western blot analysis of Rheb in mouse brain cell lysate with Rheb antibody at (A) 1, (B) 2, and (C) 4 µg/mL.



Immunohistochemistry of Rheb in mouse brain tissue with Rheb antibody at 2 µg/mL.



Immunofluorescence of Rheb in Mouse Brain cells with Rheb antibody at 20 µg/mL.