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MAPKAP1 Antibody

Catalog # ASC10516

Product Information

Application	WB, IF, E, IHC-P
Primary Accession	Q9BPZ7
Other Accession	NP_001006618, 56788407
Reactivity	Human, Mouse, Rat
Host	Rabbit
Clonality	Polyclonal
Isotype	IgG
Calculated MW	59123
Concentration (mg/ml)	1 mg/mL
Conjugate	Unconjugated
Application Notes	MAPKAP1 antibody can be used for detection of MAPKAP1 by Western blot at 0.5 - 1 □g/mL. Antibody can also be used for immunohistochemistry starting at 2.5 □g/mL. For immunofluorescence start at 20 □g/mL.

Additional Information

Gene ID	79109
Other Names	MAPKAP1 Antibody: MIP1, SIN1, JC310, SIN1b, SIN1g, MIP1, Target of rapamycin complex 2 subunit MAPKAP1, Mitogen-activated protein kinase 2-associated protein 1, TORC2 subunit MAPKAP1, mitogen-activated protein kinase associated protein 1
Target/Specificity	MAPKAP1;
Reconstitution & Storage	MAPKAP1 antibody can be stored at 4℃ for three months and -20℃, 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	MAPKAP1 Antibody is for research use only and not for use in diagnostic or therapeutic procedures.

Protein Information

Name	MAPKAP1 {ECO:0000303|PubMed:15363842, ECO:0000312|HGNC:HGNC:18752}
Function	Component of the mechanistic target of rapamycin complex 2 (mTORC2), which transduces signals from growth factors to pathways involved in proliferation, cytoskeletal organization, lipogenesis and anabolic output (PubMed:15467718, PubMed:16919458, PubMed:16962653, PubMed:17043309, PubMed:21806543, PubMed:28264193, PubMed:28968999, PubMed:30837283, PubMed:35926713). In response to

	growth factors, mTORC2 phosphorylates and activates AGC protein kinase family members, including AKT (AKT1, AKT2 and AKT3), PKC (PRKCA, PRKCB and PRKCE) and SGK1 (PubMed:16919458, PubMed:16962653, PubMed:21806543, PubMed:28264193, PubMed:28968999, PubMed:30837283, PubMed:35926713). In contrast to mTORC1, mTORC2 is nutrient-insensitive (PubMed:16962653). Within the mTORC2 complex, MAPKAP1/SIN1 acts as a substrate adapter which recognizes and binds AGC protein kinase family members for phosphorylation by MTOR (PubMed:21806543, PubMed:28264193). mTORC2 plays a critical role in AKT1 activation by mediating phosphorylation of different sites depending on the context, such as 'Thr-450', 'Ser- 473', 'Ser-477' or 'Thr-479', facilitating the phosphorylation of the activation loop of AKT1 on 'Thr-308' by PDPK1/PDK1 which is a prerequisite for full activation (PubMed:28264193, PubMed:35926713). mTORC2 catalyzes the phosphorylation of SGK1 at 'Ser-422' and of PRKCA on 'Ser-657' (PubMed:30837283, PubMed:35926713). The mTORC2 complex also phosphorylates various proteins involved in insulin signaling, such as FBXW8 and IGF2BP1 (By similarity). mTORC2 acts upstream of Rho GTPases to regulate the actin cytoskeleton, probably by activating one or more Rho-type guanine nucleotide exchange factors (PubMed:15467718). mTORC2 promotes the serum-induced formation of stress-fibers or F-actin (PubMed:15467718). MAPKAP1 inhibits MAP3K2 by preventing its dimerization and autophosphorylation (PubMed:15988011). Inhibits HRAS and KRAS independently of mTORC2 complex (PubMed:17303383, PubMed:34380736, PubMed:35522713). Enhances osmotic stress-induced phosphorylation of ATF2 and ATF2-mediated transcription (PubMed:17054722). Involved in ciliogenesis, regulates cilia length through its interaction with CCDC28B independently of mTORC2 complex (PubMed:23727834).
Cellular Location	Cell membrane; Peripheral membrane protein. Endoplasmic reticulum membrane; Peripheral membrane protein. Early endosome membrane; Peripheral membrane protein. Late endosome membrane; Peripheral membrane protein. Lysosome membrane; Peripheral membrane protein. Golgi apparatus membrane; Peripheral membrane protein. Mitochondrion outer membrane; Peripheral membrane protein. Cytoplasm, perinuclear region. Nucleus Note=The mTORC2 complex localizes to membranes: mTORC2 is active at the plasma membrane, endoplasmic reticulum membrane, lysosomes and perinuclear region (PubMed:17303383, PubMed:21867682, PubMed:30837283) Iin lysosomal membrane, mTORC2 is sensitive to lysosomal positioning in the cell (PubMed:31130364). Following phosphorylation by PKC, localizes to the perinuclear region, where the mTORC2 complexe specifically phosphorylates SGK1, but not AKT (PubMed:30837283) [Isoform 2]: Cell membrane. Nucleus [Isoform 6]: Cytoplasm. Nucleus
Tissue Location	Ubiquitously expressed, with highest levels in heart and skeletal muscle.

Background

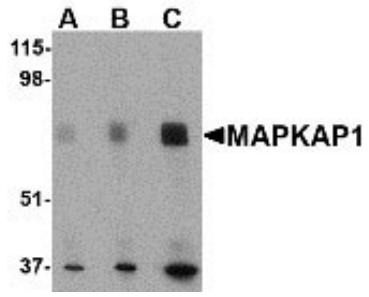
MAPKAP1 Antibody: MAPKAP1 was initially identified as the human homolog of S. pombe SIN1. Recent evidence has shown that it identical to Mip1, a protein that interacts with MEKK2, a member of the mitogen-activated protein kinase (MAPK) intracellular signaling network. MAPKAP1 is thought to prevent MEKK2 activation and dimerization by forming a complex with the inactive and non-phosphorylated MEKK2, thereby blocking the JNK1/2, ERK1/2, p38 and ERK5 MAPKs. MAPKAP1 has also been shown to play a role in the TOR signaling process, a pathway that is involved in controlling cell growth and proliferation in response to environmental cues such as nutrients, growth factors and hormones. Experiments showed that MAPKAP1 helped to maintain the TOR/rictor assembly but not the TOR/RAPTOR complex, which allowed specific phosphorylation of Akt, a kinase that is believed to couple the growth factor-PI3K signaling pathway to the nutrient-regulated TOR signaling pathway. Multiple alternatively spliced isoforms of MAPKAP1 have been

identified.

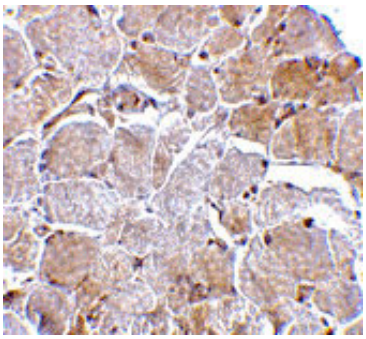
References

Schroder W, Cloonan N, Bushell G, et al. Alternative polyadenylation and splicing of mRNAs transcribed from the human Sin1 gene. Gene2004; 339:17-23.
Cheng J, Zhang D, Kim K, et al. Mip1, an MEKK2-interacting protein, controls MEKK2 dimerization and activation. Mol. Cell. Biol.2005; 25:5955-64.
Jacinto E, Facchinetti V, Liu D, et al. SIN1/MIP1 maintains rictor-mTOR complex integrity and regulates Akt phosphorylation and substrate specificity. Cell2006; 127:125-37.
Wullschleger S, Loewith R and Hall MN. TOR signaling in growth and metabolism. Cell2006; 124:471-84.

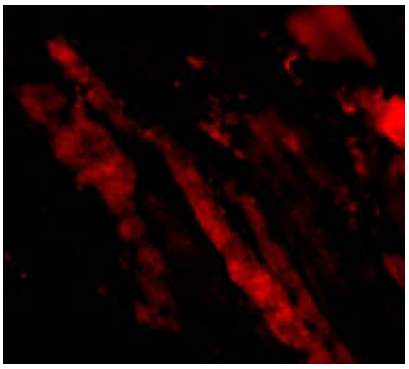
Images



Western blot analysis of MAPKAP1 in human skeletal muscle tissue lysate with MAPKAP1 antibody at (A) 0.5, (B) 1 and (C) 2 µg/mL.



Immunohistochemistry of MAPKAP1 in human skeletal muscle tissue with MAPKAP1 antibody at 2.5 µg/mL.



Immunofluorescence of MAPKAP1 in Human Skeletal Muscle cells with MAPKAP1 antibody at 20 µg/mL.