10320 Camino Santa Fe, Suite G
San Diego, CA 92121
Tel: 858.875.1900 Fax: 858.875.1999

TOR Antibody

Catalog # ASC10308

Specification

TOR Antibody - Product Information

Application	**WB, ICC**
Primary Accession	P42345
Other Accession	NP_004949, 4826730
Reactivity	**Human, Mouse**
Host	**Rabbit**
Clonality	**Polyclonal**
Isotype	**IgG**
Application Notes	**TOR antibody can be used for the detection of TOR by Western blot at 1 to 2 µg/mL. Antibody can also be used for immunocytochemistry starting at 2 µg/mL.**

TOR Antibody - Additional Information

Gene ID	**2475**

Other Names
TOR Antibody: FRAP, FRAP1, FRAP2, RAFT1, RAPT1, FRAP, FK506-binding protein 12-rapamycin complex-associated protein 1, mTOR, FK506 binding protein 12-rapamycin associated protein 1

Target/Specificity
FRAP1;

Reconstitution & Storage
TOR 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
TOR Antibody is for research use only and not for use in diagnostic or therapeutic procedures.

TOR Antibody - Protein Information

Name MTOR (HGNC:3942)

Function
Serine/threonine protein kinase which is a central regulator of cellular metabolism, growth and survival in response to hormones, growth factors, nutrients, energy and stress signals (PubMed:12087098, PubMed:12150925, PubMed:12150926, PubMed:12231510, PubMed:12718876, PubMed:14651849, PubMed:<a

href="http://www.uniprot.org/citations/15268862" target="_blank">15268862, PubMed:15467718, PubMed:15545625, PubMed:15718470, PubMed:18497260, PubMed:18762023, PubMed:18925875, PubMed:20516213, PubMed:20537536, PubMed:21659604, PubMed:23429703, PubMed:23429704, PubMed:25799227, PubMed:26018084, PubMed:29150432, PubMed:29236692, PubMed:31112131, PubMed:31601708, PubMed:32561715, PubMed:34519269, PubMed:37751742). MTOR directly or indirectly regulates the phosphorylation of at least 800 proteins (PubMed:15268862, PubMed:15467718, PubMed:17517883, PubMed:18372248, PubMed:18497260, PubMed:18925875, PubMed:20516213, PubMed:21576368, PubMed:21659604, PubMed:23429704, PubMed:29236692, PubMed:37751742). Functions as part of 2 structurally and functionally distinct signaling complexes mTORC1 and mTORC2 (mTOR complex 1 and 2) (PubMed:15268862, PubMed:15467718, PubMed:18497260, PubMed:18925875, PubMed:20516213, PubMed:21576368, PubMed:21659604, PubMed:23429704). In response to nutrients, growth factors or amino acids, mTORC1 is recruited to the lysosome membrane and promotes protein, lipid and nucleotide synthesis by phosphorylating key regulators of mRNA translation and ribosome synthesis (PubMed:12087098, PubMed:12150925, PubMed:12150926, PubMed:12231510, PubMed:12718876, PubMed:14651849, PubMed:15268862, PubMed:15467718, PubMed:15545625, PubMed:15718470, PubMed:18497260,

10320 Camino Santa Fe, Suite G
San Diego, CA 92121
Tel: 858.875.1900 Fax: 858.875.1999

PubMed:18762023, PubMed:18925875, PubMed:20516213, PubMed:20537536, PubMed:21659604, PubMed:23429703, PubMed:23429704, PubMed:25799227, PubMed:26018084, PubMed:29150432, PubMed:29236692, PubMed:31112131, PubMed:34519269). This includes phosphorylation of EIF4EBP1 and release of its inhibition toward the elongation initiation factor 4E (eiF4E) (PubMed:24403073, PubMed:29236692). Moreover, phosphorylates and activates RPS6KB1 and RPS6KB2 that promote protein synthesis by modulating the activity of their downstream targets including ribosomal protein S6, eukaryotic translation initiation factor EIF4B, and the inhibitor of translation initiation PDCD4 (PubMed:12087098, PubMed:12150925, PubMed:18925875, PubMed:29150432, PubMed:29236692). Stimulates the pyrimidine biosynthesis pathway, both by acute regulation through RPS6KB1-mediated phosphorylation of the biosynthetic enzyme CAD, and delayed regulation, through transcriptional enhancement of the pentose phosphate pathway which produces 5-phosphoribosyl-1- pyrophosphate (PRPP), an allosteric activator of CAD at a later step in synthesis, this function is dependent on the mTORC1 complex (PubMed:23429703, PubMed:23429704). Regulates ribosome synthesis by activating RNA polymerase III-dependent transcription through phosphorylation and inhibition of MAF1 an RNA polymerase III-repressor (PubMed:20516213). Activates dormant ribosomes by mediating phosphorylation of SERBP1, leading to SERBP1 inactivation and reactivation of translation (PubMed:36691768). In parallel to protein synthesis, also regulates lipid synthesis through SREBF1/SREBP1 and LPIN1 (PubMed:23426360). To maintain energy homeostasis mTORC1 may also regulate mitochondrial biogenesis through regulation of PPARGC1A (By similarity). In the same time, mTORC1 inhibits catabolic pathways: negatively regulates autophagy through phosphorylation of ULK1 (PubMed:32561715). Under nutrient sufficiency, phosphorylates ULK1 at 'Ser-758', disrupting the interaction with AMPK and preventing activation of ULK1 (PubMed:32561715). Also prevents autophagy through phosphorylation of the autophagy inhibitor DAP (PubMed:20537536). Also prevents autophagy by phosphorylating RUBCNL/Pacer under nutrient-rich conditions (PubMed:30704899). Prevents autophagy by mediating phosphorylation of AMBRA1, thereby inhibiting AMBRA1 ability to mediate ubiquitination of ULK1 and interaction between AMBRA1 and PPP2CA (PubMed:23524951, PubMed:25438055). mTORC1 exerts a feedback control on upstream growth factor signaling that includes phosphorylation and activation of GRB10 a INSR-dependent signaling suppressor (PubMed:21659604). Among other potential targets mTORC1 may phosphorylate CLIP1 and regulate microtubules (PubMed:<a

href="http://www.uniprot.org/citations/12231510" target="_blank">12231510). The mTORC1 complex is inhibited in response to starvation and amino acid depletion (PubMed:12150925, PubMed:12150926, PubMed:24403073, PubMed:31695197). The non-canonical mTORC1 complex, which acts independently of RHEB, specifically mediates phosphorylation of MiT/TFE factors MITF, TFEB and TFE3 in the presence of nutrients, promoting their cytosolic retention and inactivation (PubMed:22343943, PubMed:22576015, PubMed:22692423, PubMed:24448649, PubMed:32612235, PubMed:36608670, PubMed:36697823). Upon starvation or lysosomal stress, inhibition of mTORC1 induces dephosphorylation and nuclear translocation of TFEB and TFE3, promoting their transcription factor activity (PubMed:22343943, PubMed:22576015, PubMed:22692423, PubMed:24448649, PubMed:32612235, PubMed:36608670). The mTORC1 complex regulates pyroptosis in macrophages by promoting GSDMD oligomerization (PubMed:34289345). MTOR phosphorylates RPTOR which in turn inhibits mTORC1 (By similarity). As part of the mTORC2 complex MTOR may regulate other cellular processes including survival and organization of the cytoskeleton (PubMed:15268862, PubMed:15467718). mTORC2 plays a critical role in the phosphorylation at 'Ser-473' of AKT1, a pro- survival effector of phosphoinositide 3-kinase, facilitating its activation by PDK1 (PubMed:15718470). mTORC2 may regulate the actin cytoskeleton, through phosphorylation of PRKCA, PXN and activation of the Rho-type guanine nucleotide exchange factors RHOA and RAC1A or RAC1B (PubMed:15268862). mTORC2 also regulates the phosphorylation of SGK1 at 'Ser-422' (PubMed:18925875). Regulates osteoclastogenesis by adjusting the expression of CEBPB isoforms (By similarity). Plays an important regulatory role in the circadian clock function; regulates period length and rhythm amplitude of the suprachiasmatic nucleus (SCN) and liver clocks (By similarity).

Cellular Location

Lysosome membrane; Peripheral membrane protein; Cytoplasmic side. Endoplasmic reticulum membrane; Peripheral membrane protein; Cytoplasmic side. Golgi apparatus membrane; Peripheral membrane protein; Cytoplasmic side. Mitochondrion outer membrane; Peripheral membrane protein; Cytoplasmic side. Cytoplasm. Nucleus {ECO:0000250|UniProtKB:Q9JLN9}. Nucleus, PML body {ECO:0000250|UniProtKB:Q9JLN9}. Microsome membrane. Cytoplasmic vesicle, phagosome. Note=Shuttles between cytoplasm and nucleus. Accumulates in the nucleus in response to hypoxia (By similarity). Targeting to lysosomes depends on amino acid availability and RRAGA and RRAGB (PubMed:18497260, PubMed:20381137). Lysosome targeting also depends on interaction with MEAK7. Translocates to the lysosome membrane in the presence of TM4SF5 (PubMed:30956113) {ECO:0000250|UniProtKB:Q9JLN9, ECO:0000269|PubMed:18497260, ECO:0000269|PubMed:20381137, ECO:0000269|PubMed:29750193, ECO:0000269|PubMed:30956113}

Tissue Location

10320 Camino Santa Fe, Suite G
San Diego, CA 92121
Tel: 858.875.1900 Fax: 858.875.1999

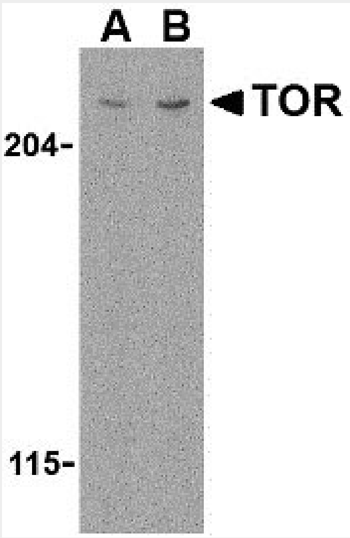
Expressed in numerous tissues, with highest levels in testis.

TOR Antibody - Protocols

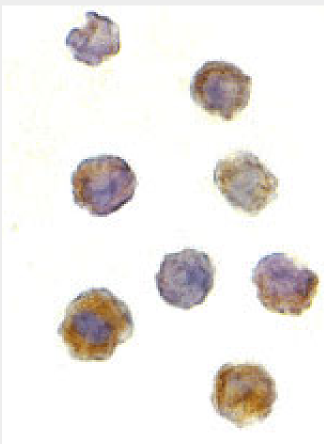
Provided below are standard protocols that you may find useful for product applications.

- Western Blot
- Blocking Peptides
- Dot Blot
- Immunohistochemistry
- Immunofluorescence
- Immunoprecipitation
- Flow Cytomety
- Cell Culture

TOR Antibody - Images



Western blot analysis of TOR in L1210 cell lysate with TOR antibody at (A) 1 and (B) 2 µg/mL.



Immunocytochemistry of TOR in L1210 cells with TOR antibody at 2 µg/mL.

TOR Antibody - Background

10320 Camino Santa Fe, Suite G
San Diego, CA 92121
Tel: 858.875.1900 Fax: 858.875.1999

TOR Antibody: The mammalian Target of Rapamycin (TOR, also known as mTOR) is an evolutionarily conserved serine/threonine kinase that regulates cell growth and cell cycle through its ability to integrate signals from nutrient levels and growth factors. It was initially discovered as a kinase whose ability to stimulate T cell proliferation in response to IL-2 could be inhibited by the immunosuppressive drug rapamycin. Rapamycin inhibits TOR in other cell types resulting in reduced cell growth and reduced rates of cell cycle and cell proliferation. TOR is normally associated with the regulatory proteins RAPTOR and GbetaL. Its downstream targets are thought to be the ribosomal protein S6 kinases and the eukaryotic initiation factor 4E binding proteins (4EBPs). Regulation of these protein families allows TOR to control protein biosynthesis.

TOR Antibody - References

Shamji AF, Ngheim P, and Schreiber SL. Integration of growth factor and nutrient signaling: implications for cancer biology. Mol. Cell 2003; 12:271-80.
Sabatini DM, Erdjument-Bromage H, Lui M, et al. RAFT1: a mammalian protein that binds to FKP12 in a rapamycin-dependent fashion and is homologous to yeast TORs. Cell 1994; 78:35-43.
Cardenas ME, Zhu D, and Heitman J. Molecular mechanisms of immunosuppression by cyclosporine, FK506, and rapamycin. Curr. Opin. Nephrol. Hypertens. 1995; 4:472-7.
Fingar DC and Blenis J. Target of rapamycin (TOR): an integrator of nutrient and growth factor signals and coordinator of cell growth and cell cycle progression. Oncogene 2004; 23:3151-71.