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mTOR Regulation Antibody Sampler Kit

1 Kit (6 x 20 microliters)

For Research Use Only. Not for Use in Diagnostic Procedures.

Product Includes	Product #	Quantity	Mol. Wt	Isotype/Source
mTOR (7C10) Rabbit mAb	2983	20 µl	289 kDa	Rabbit IgG
Phospho-mTOR (Ser2448) (D9C2) XP [®] Rabbit mAb	5536	20 µl	289 kDa	Rabbit IgG
Phospho-Raptor (Ser792) Antibody	2083	20 µl	150 kDa	Rabbit
PRAS40 (D23C7) XP [®] Rabbit mAb	2691	20 µl	40 kDa	Rabbit IgG
Phospho-PRAS40 (Thr246) (C77D7) Rabbit mAb	2997	20 µl	40 kDa	Rabbit IgG
RagC (D8H5) Rabbit mAb	9480	20 µl	50 kDa	Rabbit IgG
Anti-rabbit IgG, HRP-linked Antibody	7074	100 µl		Goat

Please visit cellsignal.com for individual component applications, species cross-reactivity, dilutions, protocols, and additional product information.

Description

The mTOR Regulation Sampler Kit provides an economical means to evaluate the regulation of mTOR signaling by such proteins as phosphorylated Raptor, RagC and PRAS40. The kit contains enough primary and secondary antibodies to perform two Western blot experiments per primary antibody.

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.

Background

The mammalian target of rapamycin (mTOR, FRAP, RAFT) is a Ser/Thr protein kinase (1-3) that functions as an ATP and amino acid sensor to balance nutrient availability and cell growth (4,5). When sufficient nutrients are available, mTOR responds to a phosphatidic acid-mediated signal to transmit a positive signal to p70 S6 kinase and participate in the inactivation of the eIF4E inhibitor, 4E-BP1 (6). These events result in the translation of specific mRNA subpopulations. mTOR is phosphorylated at Ser2448 via the PI3 kinase/Akt signaling pathway and autophosphorylated at Ser2481 (7,8). mTOR plays a key role in cell growth and homeostasis and may be abnormally regulated in tumors. For these reasons, mTOR is currently under investigation as a potential target for anti-cancer therapy (9).

The regulatory associated protein of mTOR (Raptor) was identified as an mTOR binding partner that mediates mTOR signaling to downstream targets (10,11). Raptor binds to mTOR substrates, including 4E-BP1 and p70 S6 kinase, through their TOR signaling (TOS) motifs and is required for mTOR-mediated phosphorylation of these substrates (12,13). PRAS40 interacts with raptor in insulin-deprived cells and inhibits the activation of the mTORC1 pathway. Phosphorylation of PRAS40 by Akt at Thr246 relieves PRAS40 inhibition of mTORC1 (14). Recently raptor has been identified as a direct substrate of the AMP-activated protein kinase (AMPK) (15). AMPK phosphorylates raptor on Ser722/Ser792 (15). This phosphorylation is essential for inhibition of the raptor-containing mTOR complex 1 (mTORC1) and induces cell cycle arrest when cells are stressed for energy (15). These findings suggest that raptor is a critical switch that correlates cell cycle progression with energy status. The activity of mTORC1 kinase complex is modulated by energy levels, growth factors and amino acids (16,17). Recent studies found that RagA, RagB, RagC and RagD, the four related GTPases, interact with raptor in the mTORC1 complex (18,19). These interactions are both necessary and sufficient for mTORC1 activation in response to amino acid signals (18,19).

Background References

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