phospho-4E-BP1 [pT46]. Rabbit Phosphorylation Site-Specific Antibody

Background

Eukaryotic initiation factor 4E binding protein 1 (4E-BP1), also known as PHAS, is a ~20 kDa member of a family of eIF4E-binding proteins whose binding affinity to eIF4E is regulated by its phosphorylation. It inhibits cap-dependent translation by binding to eIF4E on the same site that overlaps the binding site for eIF4G, preventing its binding to the latter and eventually leading to an increase in mRNA translation. The phosphorylatin of 4E-BP1 is critical in determining cell fate by controlling translation initiation and apoptotic potency. 4E-BP1 is hyperphosphorylated in response to several external stimuli including hormones, growth factors, mitogens, cytokines and G-protein–coupled receptors and in response to stress conditions including nutrient deprivation. The phosphorylation of 4E-BP1 increases in response to activated phosphoinositol 3'-kinase (PI-3K) or its downstream effector Akt/PKB. 4E-BP1 is believed to mediate PI-3K and FRAP/mTOR signaling and is phosphorylated on at least six serine and threonine sites (Thr 37, Thr 46, Ser 65, Thr 70, Ser 83, and Ser 112). The phosphorylation of these sites is believed to occur in an orderly fashion where phosphorylation of threonine 37 and 46 by FRAP/mTOR is a priming step for subsequent phosphorylation of 4E-BP1 at the carboxy-terminal sites.

Ordering Information

Catalog Number
X2009P

Size
10 Miniblots

Form
Affinity Purified

Host/Clone
Rabbit

Formulation
Provided as solution in phosphate buffered saline, pH 7.3, with 1.0 mg/ml BSA and 0.05% sodium azide

Concentration
See vial for concentration

Isotype
IgG

Applications
Western Blot

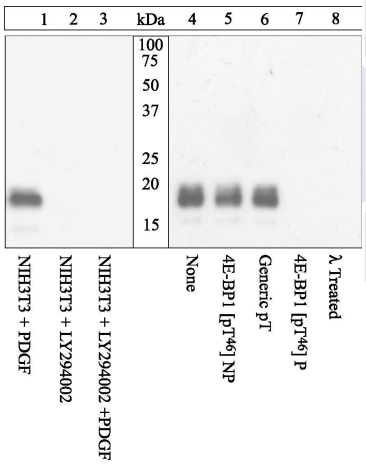
Species Reactivity
Human, Mouse

Accession Number

Human	Q13541
Mouse	Q60876

Immunogen

Chemically synthesized phosphopeptide derived from the region of human 4E-BP1 that contains threonine 46. The sequence is conserved in human, mouse and rat.



Lysates prepared from NIH3T3 cells left untreated or treated with PI -3K inhibitor LY2904002 (lanes 2 & 3), prior to PDGF stimulation (lanes 1 & 3) and from EGF-treated HEK293 cells (4-8), Membranes were then left untreated (lanes 1-7) or treated with Lambda phosphatase (8), and incubated with 4E-BP1 [pT46] antibody for two hours at room temperature, following prior incubation with: no peptide (lanes 1 & 2), non-phosphopeptide corresponding to the immunogen (3), a generic phospho-threonine-containing peptide (4), or the phosphopeptide immunogen (5).

Positive Control/Tissue Expression

NIH3T3 cell lysate

Comments

Optimal concentration should be evaluated by serial dilutions. For Western blotting applications, we recommend using the antibody at a 1:1000 dilution.

Purification

Antigen Immunoaffiinity Purification

Ship Conditions

Ship at ambient temperature, freeze upon arrival

Storage Customer

Product should be stored at -20ºC. Aliquot to avoid freeze/thaw cycles

Stability

Products are stable for one year from purchase when stored properly

References

1. Stephens, L., et al. (2005) Phosphoinositide 3-kinases as drug targets in cancer. Curr. Opin. Pharmacol. 5(4):357-365.
2. Zhou, L., et al. (2005) 4E-binding protein phosphorylation and eukaryotic initiation factor-4E release are required for airway smooth muscle hypertrophy. Am. J. Respir. Cell Mol. Biol. 33(2):195-202.
3. Greenberg, V.L. and S.G. Zimmer (2005) Paclitaxel induces the phosphorylation of the eukaryotic translation initiation factor 4E-binding protein 1 through a Cdk1-dependent mechanism. Oncogene 24(30):4851-4860.
4. Wang, X., et al. (2005) Distinct signaling events downstream of mTOR cooperate to mediate the effects of amino acids and insulin on initiation factor 4E-binding proteins. Mol. Cell Biol. 25(7):2558-2572.
5. Li, W. and B.E. Sumpio (2005) Strain-induced vascular endothelial cell proliferation requires PI3K-dependent mTOR -4E-BP1 signal pathway. Am. J. Physiol. Heart Circ. Physiol. 288(4):H1591-H1597.
6. Li, S., et al. (2002) Translational control of cell fate: availability of phosphorylation sites on translational repressor 4E-BP1 governs its proapoptotic potency. Mol. Cell Biol. 22(8):2853-2861.
7. Gingras, A.C., et al. (2001) Hierarchical phosphorylation of the translation inhibitor 4E-BP1. Genes Dev. 15(21):2852 -2864.
8. Gingras, A.C., et al. (1999) Regulation of 4E-BP1 phosphorylation: a novel two-step mechanism. Genes Dev. 13 (11):1422-1437.

Product Specific References

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