SANTA CRUZ BIOTECHNOLOGY, INC.

p-4E-BP1/2/3 (A-10): sc-271947

SANTA CRUZ BIOTECHNOLOGY

The Power to Question

BACKGROUND

The multisubunit eukaryotic translation initiation factor (eIF) 4F recruits 40S ribosomal subunits to the 5' end of mRNA. The eIF4F subunit eIF4E interacts directly with the mRNA 5' cap structure. Assembly of the eIF4F complex is inhibited by a family of repressor polypeptides, the eIF4E-binding proteins (4E-BPs). 4E-BP1 (also known as PHAS-1) normally binds eIF4E, inhibiting cap-dependent translation. Hyper-phosphorylation of 4E-BP1 disrupts this binding, activating cap-dependent translation. The PI 3-kinase/Akt pathway and the FRAP/mTOR kinase regulate 4E-BP1. 4E-BP1 is phosphorylated *in vivo* on multiple residues and phosphorylation by FRAP/mTOR on Threonine 37 and Threonine 46 of human 4E-BP1 may prime it for subsequent phosphorylation at sites including Serine 65 and Threonine 70. The corresponding rat residues include Threonine 36, Threonine 45, Serine 64 and Threonine 69. *In vitro,* 4E-BP1 is also phosphorylated by ataxia telangiectasia (ATM) at human Serine 112 (rat Serine 111) in response to an increase in Insulin levels.

SOURCE

p-4E-BP1/2/3 (A-10) is a mouse monoclonal antibody epitope corresponding to a short amino acid sequence containing phosphorylated Thr 45 of human origin.

PRODUCT

Each vial contains 200 µg IgG_{2a} kappa light chain in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

p-4E-BP1/2/3 (A-10) is available conjugated to agarose (sc-271947 AC), 500 µg/0.25 ml agarose in 1 ml, for IP; to HRP (sc-271947 HRP), 200 µg/ml, for WB, IHC(P) and ELISA; to either phycoerythrin (sc-271947 PE), fluorescein (sc-271947 FITC), Alexa Fluor® 488 (sc-271947 AF488), Alexa Fluor® 546 (sc-271947 AF546), Alexa Fluor® 594 (sc-271947 AF594) or Alexa Fluor® 647 (sc-271947 AF647), 200 µg/ml, for WB (RGB), IF, IHC(P) and FCM; and to either Alexa Fluor® 680 (sc-271947 AF680) or Alexa Fluor® 790 (sc-271947 AF790), 200 µg/ml, for Near-Infrared (NIR) WB, IF and FCM.

Blocking peptide available for competition studies, sc-271947 P, (100 µg peptide in 0.5 ml PBS containing < 0.1% sodium azide and 0.2% stabilizer protein).

RESEARCH USE

For research use only, not for use in diagnostic procedures.

APPLICATIONS

p-4E-BP1/2/3 (A-10) is recommended for detection of Thr 45 phosphorylated 4E-BP1 and correspondingly phosphorylated 4E-BP2 and 4E-BP3 of mouse, rat and human origin by Western Blotting (starting dilution 1:100, dilution range 1:100-1:1000), immunoprecipitation [1-2 µg per 100-500 µg of total protein (1 ml of cell lysate)], immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500) and solid phase ELISA (starting dilution 1:30, dilution range 1:30-1:3000).

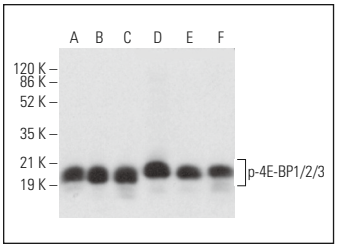
Molecular Weight of p-4E-BP1: 21 kDa.

Positive Controls: MDA-MB-231 cell lysate: sc-2232, K-562 whole cell lysate: sc-2203 or HL-60 whole cell lysate: sc-2209.

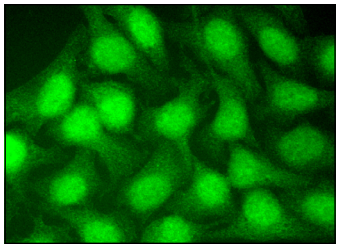
RECOMMENDED SUPPORT REAGENTS

To ensure optimal results, the following support reagents are recommended: 1) Western Blotting: use m-IgGκ BP-HRP: sc-516102 or m-IgGκ BP-HRP (Cruz Marker): sc-516102-CM (dilution range: 1:1000-1:10000), Cruz Marker™ Molecular Weight Standards: sc-2035, TBS Blotto B Blocking Reagent: sc-2335 (use 50 mM NaF, sc-24988, as diluent), Lambda Phosphatase: sc-200312A and Western Blotting Luminol Reagent: sc-2048. 2) Immunoprecipitation: use Protein A/G PLUS-Agarose: sc-2003 (0.5 ml agarose/2.0 ml). 3) Immunofluorescence: use m-IgGκ BP-FITC: sc-516140 or m-IgGκ BP-PE: sc-516141 (dilution range: 1:50-1:200) with UltraCruz® Mounting Medium: sc-24941 or UltraCruz® Hard-set Mounting Medium: sc-359850.

DATA



p-4E-BP1/2/3 (A-10): sc-271947. Western blot analysis of 4E-BP1/2/3 phosphorylation in MDA-MB-231 (**A**), K-562 (**B**), HL-60 (**C**), F9 (**D**), NIH/3T3 (**E**) and C6 (**F**) whole cell lysates.



p-4E-BP1/2/3 (A-10): sc-271947. Immunofluorescence staining of formalin-fixed HeLa cells showing nuclear and cytoplasmic localization.

SELECT PRODUCT CITATIONS

1. Nie, X., et al. 2018. mTOR acts as a pivotal signaling hub for neural crest cells during craniofacial development. PLoS Genet. 14: e1007491.
2. Amorim, R., et al. 2022. Mitochondria-targeted anti-oxidant AntiOxCIN$_4$ improved liver steatosis in Western diet-fed mice by preventing lipid accumulation due to upregulation of fatty acid oxidation, quality control mechanism and antioxidant defense systems. Redox Biol. 55: 102400.
3. Mahalakshmi, R., et al. 2022. Hormetic effect of low doses of rapamycin triggers anti-aging cascades in WRL-68 cells by modulating an mTOR-mitochondria cross-talk. Mol. Biol. Rep. 49: 463-476.
4. Sui, A., et al. 2023. Polystyrene nanoplastics inhibit StAR expression by activating HIF-1α via ERK1/2 MAPK and Akt pathways in TM3 Leydig cells and testicular tissues of mice. Food Chem. Toxicol. 173: 113634.
5. Kubaichuk, K., et al. 2023. USP10 contributes to colon carcinogenesis via mTOR/S6K mediated HIF-1α but not HIF-2α protein synthesis. Cells 12: 1585.
6. Nguele Meke, F., et al. 2024. Inhibition of PRL2 upregulates PTEN and attenuates tumor growth in Tp53-deficient sarcoma and lymphoma mouse models. Cancer Res. Commun. 4: 5-17.

STORAGE

Store at 4° C, **DO NOT FREEZE**. Stable for one year from the date of shipment. Non-hazardous. No MSDS required.