SANTA CRUZ BIOTECHNOLOGY, INC.

GCN2 (H-300): sc-66902

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The Power to Question

BACKGROUND

The family of stress-responsive protein kinases include HRI (heme-regulated inhibitor or EIF2AK1), PKR (EIF2AK2 or TIK), PERK (EIF2AK3) and GCN2 (EIF2AK4). These proteins phosphorylate the eukaryotic translation initiation factor 2α (eIF2α) on Ser 51 to regulate general and gene-specific protein synthesis. Phosphorylated eIF2α acts as an inhibitor of its guanine nucleotide exchange factor eIF2B. GCN2, a unique eIF2α kinase, exists in all eukaryotes from yeast to mammals. In mammals, expression of GCN2 is highest in liver and brain tissues. GCN2 primarily initiates the phosphorylation of eIF2α in response to UV, but has been shown to increase phosphorylation activity in response to serum starvation. Also, substitution of Asp 83 for Ala on eIF2α results in impaired phosphorylation by GCN2 and PKR, suggesting a contribution of remote residues to kinase-substrate recognition.

REFERENCES

1. Berlanga, J.J., et al. 1999. Characterization of a mammalian homolog of the GCN2 eukaryotic initiation factor 2α kinase. Eur. J. Biochem. 265: 754-762.
2. Jiang, H.Y., et al. 2003. Phosphorylation of the α subunit of eukaryotic initiation factor 2 is required for activation of NFκB in response to diverse cellular stresses. Mol. Cell. Biol. 23: 5651-5663.
3. Anthony, T.G., et al. 2004. Preservation of liver protein synthesis during dietary leucine deprivation occurs at the expense of skeletal muscle mass in mice deleted for eIF2 kinase GCN2. J. Biol. Chem. 279: 36553-36561.
4. Costa-Mattioli, M., et al. 2005. Translational control of hippocampal synaptic plasticity and memory by the eIF2α kinase GCN2. Nature 436: 1166-1173.
5. Hamanaka, R.B., et al. 2005. PERK and GCN2 contribute to eIF2α phosphorylation and cell cycle arrest after activation of the unfolded protein response pathway. Mol. Biol. Cell 16: 5493-5501.
6. Dey, M., et al. 2005. PKR and GCN2 kinases and guanine nucleotide exchange factor eukaryotic translation initiation factor 2B (eIF2B) recognize overlapping surfaces on eIF2α. Mol. Cell. Biol. 25: 3063-3075.
7. Jiang, H.Y., et al. 2005. GCN2 phosphorylation of eIF2α activates NFκB in response to UV irradiation. Biochem. J. 385: 371-380.

CHROMOSOMAL LOCATION

Genetic locus: EIF2AK4 (human) mapping to 15q15.1; Eif2ak4 (mouse) mapping to 2 E5.

SOURCE

GCN2 (H-300) is a rabbit polyclonal antibody raised against amino acids 1350-1649 mapping at the C-terminus of GCN2 of human origin.

PRODUCT

Each vial contains 200 µg IgG in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

APPLICATIONS

GCN2 (H-300) is recommended for detection of GCN2 of mouse, rat and human origin by Western Blotting (starting dilution 1:200, 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).

GCN2 (H-300) is also recommended for detection of GCN2 in additional species, including equine, canine and bovine.

Suitable for use as control antibody for GCN2 siRNA (h): sc-45644, GCN2 siRNA (m): sc-45645, GCN2 shRNA Plasmid (h): sc-45644-SH, GCN2 shRNA Plasmid (m): sc-45645-SH, GCN2 shRNA (h) Lentiviral Particles: sc-45644-V and GCN2 shRNA (m) Lentiviral Particles: sc-45645-V.

Molecular Weight of hyperphosphorylated GCN2: 150-206 kDa.

Positive Controls: NIH/3T3 whole cell lysate: sc-2210.

RECOMMENDED SECONDARY REAGENTS

To ensure optimal results, the following support (secondary) reagents are recommended: 1) Western Blotting: use goat anti-rabbit IgG-HRP: sc-2004 (dilution range: 1:2000-1:100,000) or Cruz Marker™ compatible goat anti-rabbit IgG-HRP: sc-2030 (dilution range: 1:2000-1:5000), Cruz Marker™ Molecular Weight Standards: sc-2035, TBS Blotto A Blocking Reagent: sc-2333 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 goat anti-rabbit IgG-FITC: sc-2012 (dilution range: 1:100-1:400) or goat anti-rabbit IgG-TR: sc-2780 (dilution range: 1:100-1:400) with UltraCruz™ Mounting Medium: sc-24941.

STORAGE

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

RESEARCH USE

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

PROTOCOLS

See our web site at www.scbt.com or our catalog for detailed protocols and support products.