SANTA CRUZ BIOTECHNOLOGY, INC.

p-PKR (Thr 446): sc-101783

SANTA CRUZ BIOTECHNOLOGY

The Power to Question

BACKGROUND

An interferon-inducible, RNA-dependent protein serine/threonine kinase, PKR has various designations. Mouse PKR is known as DAI, dsJ, PI kinase, p65, p67 or TIK, whereas human PKR is known as p68 or p69. PKR phosphorylates its substrate, a subunit of protein synthesis initiation factor eIF-2 on Ser 51 to inhibit translation. PKR contains two dsRNA binding motifs required for its activation by dsRNA. Three kinds of regulation of PKR enzymatic activity occur, and these include transcriptional regulation in response to interferon, an autoregulatory mechanism controlling PKR expression at the level of translation, and posttranslational regulation by RNA mediated autophosphorylation. Human PKR contains at least 15 autophosphorylation sites, but only Thr 446 and Thr 451 in the activation loop are critical for its kinase activity. Thr 446 is the *in vivo* autophosphorylation site of PKR. Mutation of threonine to alanine at position 446 substantially reduces PKR function, and mutant kinase containing Ala 451 is completely inactive.

REFERENCES

1. Hershey, J.W. 1989. Protein phosphorylation controls translation rates. J. Biol. Chem. 264: 20823-20826.
2. Samuel, C.E. 1993. The eIF-2 α protein kinases, regulators of translation in eukaryotes from yeasts to humans. J. Biol. Chem. 268: 7603-7606.
3. Tanaka, H. and Samuel, C.E. 1994. Mechanism of interferon action: structure of the mouse PKR gene encoding the interferon-inducible RNA-dependent protein kinase. Proc. Natl. Acad. Sci. USA 91: 7995-7999.
4. Romano, P.R., et al. 1998. Auto-phosphorylation in the activation loop is required for full kinase activity *in vivo* of human and yeast eukaryotic initiation factor 2α kinases PKR and GCN2. Mol. Cell. Biol. 18: 2282-2297.
5. Zhang, F., et al. 2001. Binding of double-stranded RNA to protein kinase PKR is required for dimerization and promotes critical autophosphorylation events in the activation loop. J. Biol. Chem. 276: 24946-24958.

CHROMOSOMAL LOCATION

Genetic locus: EIF2AK2 (human) mapping to 2p22.2.

SOURCE

p-PKR (Thr 446) is a rabbit polyclonal antibody raised against a short amino acid sequence containing Thr 446 phosphorylated PKR of human origin.

PRODUCT

Each vial contains 100 µg IgG in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

STORAGE

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

PROTOCOLS

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

APPLICATIONS

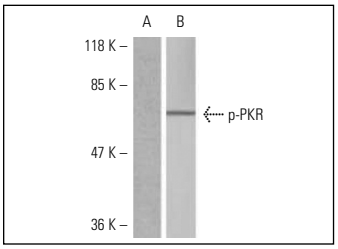
p-PKR (Thr 446) is recommended for detection of Thr 446 phosphorylated PKR of human origin by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000), immunoprecipitation [1-2 µg per 100-500 µg of total protein (1 ml of cell lysate)], immunofluorescence and immunohistochemistry (including paraffin-embedded sections) (starting dilution 1:50, dilution range 1:50-1:500).

Suitable for use as control antibody for PKR siRNA (h): sc-36263, PKR shRNA Plasmid (h): sc-36263-SH and PKR shRNA (h) Lentiviral Particles: sc-36263-V.

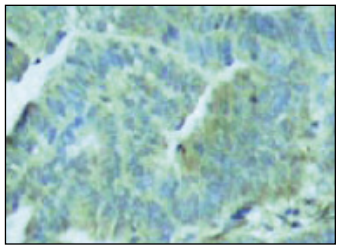
Molecular Weight of p-PKR: 68 kDa.

Positive Controls: HeLa + IFN-α + Calyculin A cell lysate: sc-24684 or HeLa + Calyculin A cell lysate: sc-2271.

DATA



p-PKR (Thr 446): sc-101783. Western blot analysis of PKR phosphorylation expression in K-562 (**A**) and starved K-562 (**B**) whole cell lysates.



p-PKR (Thr 446): sc-101783. Immunoperoxidase staining of formalin-fixed, paraffin-embedded human colon carcinoma tissue showing cytoplasmic staining.

SELECT PRODUCT CITATIONS

1. Toth, A.M., et al. 2009. RNA-specific adenosine deaminase ADAR1 suppresses measles virus-induced apoptosis and activation of protein kinase PKR. J. Biol. Chem. 284: 29350-29356.
2. Groskreutz, D.J., et al. 2010. Respiratory syncytial virus limits α subunit of eukaryotic translation initiation factor 2 (eIF2α) phosphorylation to maintain translation and viral replication. J. Biol. Chem. 285: 24023-24031.
3. Lozon, T.I., et al. 2010. PKR-Dependent CHOP induction limits hyperoxia-induced lung injury. Am. J. Physiol. Lung Cell. Mol. Physiol. 300: L422-L429.
4. Katta, A., et al. 2012. Diminished muscle growth in the obese Zucker rat following overload is associated with hyperphosphorylation of AMPK and dsRNA-dependent protein kinase. J. Appl. Physiol. 113: 377-384.
5. Ryoo, S.R., et al. 2012. Functional delivery of DNAzyme with iron oxide nanoparticles for hepatitis C virus gene knockdown. Biomaterials 33: 2754-2761.

RESEARCH USE

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