SANTA CRUZ BIOTECHNOLOGY, INC.

PERK siRNA (h): sc-36213

BACKGROUND

An interferon-inducible, RNA-dependent protein serine/threonine kinase (PKR) has been described. In earlier literature, PKR is variously known as DAI, dsJ, PI kinase, p65, p67 or TIK, for the mouse kinase; and p68 or p69 for the human kinase. The PKR kinase substrate is the α subunit of protein synthesis initiation factor eIF-2. Phosphorylation of eIF-2α on Ser 51 results in inhibition of translation. The serine/threonine kinase catalytic domains map to the carboxy-terminal half of the protein while the RNA-binding domains are located in the amino-terminal region. PERK is a type I transmembrane protein located in the endoplasmic reticulum (ER) that contains a kinase domain similar to the kinase domain of PKR. PERK is activated in response to ER stress and phosphorylates eIF-2α, thus inhibiting the translation of mRNA.

CHROMOSOMAL LOCATION

Genetic locus: EIF2AK3 (human) mapping to 2p11.2.

PRODUCT

PERK siRNA (h) is a pool of 3 target-specific 19-25 nt siRNAs designed to knock down gene expression. Each vial contains 3.3 nmol of lyophilized siRNA, sufficient for a 10 µM solution once resuspended using protocol below. Suitable for 50-100 transfections. Also see PERK shRNA Plasmid (h): sc-36213-SH and PERK shRNA (h) Lentiviral Particles: sc-36213-V as alternate gene silencing products.

For independent verification of PERK (h) gene silencing results, we also provide the individual siRNA duplex components. Each is available as 3.3 nmol of lyophilized siRNA. These include: sc-36213A, sc-36213B and sc-36213C.

STORAGE AND RESUSPENSION

Store lyophilized siRNA duplex at -20° C with desiccant. Stable for at least one year from the date of shipment. Once resuspended, store at -20° C, avoid contact with RNAses and repeated freeze thaw cycles.

Resuspend lyophilized siRNA duplex in 330 µl of the RNAse-free water provided. Resuspension of the siRNA duplex in 330 µl of RNAse-free water makes a 10 µM solution in a 10 µM Tris-HCl, pH 8.0, 20 mM NaCl, 1 mM EDTA buffered solution.

APPLICATIONS

PERK siRNA (h) is recommended for the inhibition of PERK expression in human cells.

SUPPORT REAGENTS

For optimal siRNA transfection efficiency, Santa Cruz Biotechnology's siRNA Transfection Reagent: sc-29528 (0.3 ml), siRNA Transfection Medium: sc-36868 (20 ml) and siRNA Dilution Buffer: sc-29527 (1.5 ml) are recommended. Control siRNAs or Fluorescein Conjugated Control siRNAs are available as 10 µM in 66 µl. Each contain a scrambled sequence that will not lead to the specific degradation of any known cellular mRNA. Fluorescein Conjugated Control siRNAs include: sc-36869, sc-44239, sc-44240 and sc-44241. Control siRNAs include: sc-37007, sc-44230, sc-44231, sc-44232, sc-44233, sc-44234, sc-44235, sc-44236, sc-44237 and sc-44238.

GENE EXPRESSION MONITORING

PERK (B-5): sc-377400 is recommended as a control antibody for monitoring of PERK gene expression knockdown by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000) or immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500).

RT-PCR REAGENTS

Semi-quantitative RT-PCR may be performed to monitor PERK gene expression knockdown using RT-PCR Primer: PERK (h)-PR: sc-36213-PR (20 µl, 454 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Kim, K.M., et al. 2007. Carbon monoxide induces heme oxygenase-1 via activation of protein kinase R-like endoplasmic reticulum kinase and inhibits endothelial cell apoptosis triggered by endoplasmic reticulum stress. Circ. Res. 101: 919-927.
2. Lu, W., et al. 2009. The role of nitric-oxide synthase in the regulation of UVB light-induced phosphorylation of the α subunit of eukaryotic initiation factor 2. J. Biol. Chem. 284: 24281-24288.
3. Wu, X., et al. 2010. Albumin overload induces apoptosis in renal tubular epithelial cells through a CHOP-dependent pathway. OMICS 14: 61-73.
4. Lanza, A., et al. 2011. Deregulation of PERK in the autoimmune disease pemphigus vulgaris occurs via IgG-independent mechanisms. Br. J. Dermatol. 164: 336-343.
5. Guo, X., et al. 2013. Patulin induces pro-survival functions via autophagy inhibition and p62 accumulation. Cell Death Dis. 4: e822.
6. Zhou, Y., et al. 2014. Ampelopsin induces cell growth inhibition and apoptosis in breast cancer cells through Ros generation and endoplasmic reticulum stress pathway. PLoS ONE 9: e89021.
7. Wei, C., et al. 2015. Involvement of general control nonderepressible kinase 2 in cancer cell apoptosis by posttranslational mechanisms. Mol. Biol. Cell 26: 1044-1057.
8. Ding, X., et al. 2016. Numb protects human renal tubular epithelial cells from bovine serum albumin-induced apoptosis through antagonizing CHOP/PERK pathway. J. Cell. Biochem. 117: 163-171.
9. Fu, X., et al. 2016. Malonate induces the assembly of cytoplasmic stress granules. FEBS Lett. 590: 22-33.
10. Panda, PK., et al. 2016. Abrus agglutinin, a type II ribosome inactivating protein inhibits Akt/PH domain to induce endoplasmic reticulum stress mediated autophagy-dependent cell death. Mol. Carcinog. 56: 389-401.
11. Zanotto-Filho, A., et al. 2016. Alkylating agent induced NRF2 blocks endoplasmic reticulum stress-mediated apoptosis via control of glutathione pools and protein thiol homeostasis. Mol. Cancer Ther. 15: 3000-3014.

RESEARCH USE

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