SANTA CRUZ BIOTECHNOLOGY, INC.

14-3-3 σ siRNA (h): sc-29590

BACKGROUND

14-3-3 proteins regulate many cellular processes relevant to cancer biology, notably apoptosis, mitogenic signaling and cell-cycle checkpoints. Seven isoforms, denoted 14-3-3 β, γ, ε, ζ, η, θ and σ, comprise this family of signaling intermediates. 14-3-3 σ, also known as SFN, stratifin, HME1 or YWHAS, is a secreted adaptor protein that is involved in regulating both general and specific signaling pathways. Expressed predominately in stratified squamous keratinising epithelium, 14-3-3 σ is able to bind and modify the activity of a large number of proteins, such as KRT17 (Keratin 17), through recognition of a phosphothreonine or phosphoserine motif. When bound to Keratin 17, for example, 14-3-3 σ acts to stimulate the Akt/mTOR signaling pathway by upregulating protein synthesis and cell growth. 14-3-3 σ also functions to positively mediate IGF-I-induced cell cycle progression and can bind to a variety of translation initiation factors, thus controlling mitotic translation. In response to tumor growth, 14-3-3 σ positively regulates the tumor suppressor p53 and increases the rate of p53-regulated inhibition of G_2/M cell cycle progression. Multiple isoforms of 14-3-3 σ exist due to alternative splicing events.

REFERENCES

1. Yang, H.Y., et al. 2003. 14-3-3 σ positively regulates p53 and suppresses tumor growth. Mol. Cell. Biol. 23: 7096-7107.
2. Wilker, E.W., et al. 2005. A structural basis for 14-3-3 σ functional specificity. J. Biol. Chem. 280: 18891-18898.

CHROMOSOMAL LOCATION

Genetic locus: SFN (human) mapping to 1p36.11.

PRODUCT

14-3-3 σ 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 14-3-3 σ shRNA Plasmid (h): sc-29590-SH and 14-3-3 σ shRNA (h) Lentiviral Particles: sc-29590-V as alternate gene silencing products.

For independent verification of 14-3-3 σ (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-29590A, sc-29590B and sc-29590C.

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

14-3-3 σ siRNA (h) is recommended for the inhibition of 14-3-3 σ 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

14-3-3 σ (E-11): sc-166473 is recommended as a control antibody for monitoring of 14-3-3 σ 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 14-3-3 σ gene expression knockdown using RT-PCR Primer: 14-3-3 σ (h)-PR: sc-29590-PR (20 µl, 597 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Pozuelo-Rubio, M. 2011. Regulation of autophagic activity by 14-3-3 ζ proteins associated with class III phosphatidylinositol-3-kinase. Cell Death Differ. 18: 479-492.
2. Nagappan, A., et al. 2013. *Helicobacter pylori* infection combined with DENA revealed altered expression of p53 and 14-3-3 isoforms in Gulo$^{-/-}$ mice. Chem. Biol. Interact. 206: 143-152.
3. Qin, L., et al. 2014. Reversible epigenetic regulation of 14-3-3 σ expression in acquired gemcitabine resistance by UHRF1 and DNA methyltransferase 1. Mol. Pharmacol. 86: 561-569.
4. Peng, C., et al. 2015. The 14-3-3 σ/GSK3β/β-catenin/ZEB1 regulatory loop modulates chemo-sensitivity in human tongue cancer. Oncotarget 6: 20177-20189.
5. Qin, L., et al. 2016. 14-3-3 σ regulation of and interaction with YAP1 in acquired gemcitabine resistance via promoting ribonucleotide reductase expression. Oncotarget 7: 17726-17736.
6. Habib, T., et al. 2017. AKT1 has dual actions on the glucocorticoid receptor by cooperating with 14-3-3. Mol. Cell. Endocrinol. 439: 431-443.
7. Chen, Y., et al. 2017. 14-3-3 σ contributes to radioresistance by regulating DNA repair and cell cycle via PARP1 and CHK2. Mol. Cancer Res. 15: 418-428.
8. Li, X., et al. 2021. Lappaol F, an anticancer agent, inhibits YAP via transcriptional and post-translational regulation. Pharm. Biol. 59: 619-628.

RESEARCH USE

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