SANTA CRUZ BIOTECHNOLOGY, INC.

G3BP1 siRNA (h): sc-75076

BACKGROUND

G3BP1 (GTPase activating protein (SH3 domain) binding protein 1), also known as G3BP or HDH-VIII, is a ubiquitously expressed protein that localizes to the cytoplasm in proliferating cells and to the nucleus in non-proliferating cells. One of several DNA-unwinding enzymes, G3BP1 functions as a sequence-specific, phosphorylation-dependent helicase that unwinds partial RNA and DNA duplexes containing hanging 3'- or 5'-ends. G3BP1 uses magnesium as a cofactor and, in addition to its helicase activity, acts as an endoribonuclease that cleaves mRNA between adenine and cytosine residues at the 3'-UTR. An element of the Ras signaling pathway, G3BP1 binds to the SH3 domain of Ras GTPase-activating protein (Ras GAP) in proliferating cells, thereby regulating Ras signaling events in developing tissues. Due to its involvement in both DNA replication and signaling pathways within the cell, G3BP1 expression is implicated in the pathogenesis of several cancers, including esophageal squamous carcinoma.

REFERENCES

1. Parker, F., et al. 1996. A Ras-GTPase-activating protein SH3-domain-binding protein. Mol. Cell. Biol. 16: 2561-2569.
2. Costa, M., et al. 1999. Human DNA helicase VIII: a DNA and RNA helicase corresponding to the G3BP protein, an element of the ras transduction pathway. Nucleic Acids Res. 27: 817-821.
3. Tourrière, H., et al. 2001. RasGAP-associated endoribonuclease G3BP: selective RNA degradation and phosphorylation-dependent localization. Mol. Cell. Biol. 21: 7747-7760.

CHROMOSOMAL LOCATION

Genetic locus: G3BP1 (human) mapping to 5q33.1.

PRODUCT

G3BP1 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 G3BP1 shRNA Plasmid (h): sc-75076-SH and G3BP1 shRNA (h) Lentiviral Particles: sc-75076-V as alternate gene silencing products.

For independent verification of G3BP1 (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-75076A, sc-75076B and sc-75076C.

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

G3BP1 siRNA (h) is recommended for the inhibition of G3BP1 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

G3BP1 (H-10): sc-365338 is recommended as a control antibody for monitoring of G3BP1 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).

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, UltraCruz® Blocking Reagent: sc-516214 and Western Blotting Luminol Reagent: sc-2048. 2) 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.

RT-PCR REAGENTS

Semi-quantitative RT-PCR may be performed to monitor G3BP1 gene expression knockdown using RT-PCR Primer: G3BP1 (h)-PR: sc-75076-PR (20 µl). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Somasekharan, S.P., et al. 2015. YB-1 regulates stress granule formation and tumor progression by translationally activating G3BP1. J. Cell Biol. 208: 913-929.
2. Zhang, C.H., et al. 2020. G3BP1 promotes human breast cancer cell proliferation through coordinating with GSK-3β and stabilizing β-catenin. Acta Pharmacol. Sin. 42: 1900-1912.
3. Kumar, R., et al. 2021. SILAC-based quantitative MS approach reveals Withaferin A regulated proteins in prostate cancer. J. Proteomics 247: 104334.

RESEARCH USE

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