SANTA CRUZ BIOTECHNOLOGY, INC.

G6PD siRNA (h): sc-60667

BACKGROUND

Glucose-6-phosphate 1-dehydrogenase (G6PD) plays an important role in the pentose phosphate pathway. It is a member of the glucose-6-phosphate dehydrogenase family of proteins. G6PD is a ubiquitous enzyme that produces pentose sugars for nucleic acid synthesis, but is also involved in carbohydrate degradation, as it is one of the main producers of NADPH reducing power. G6PD has NADP as a co-factor and structural element. It can be found as a homodimer or homotetramer, and is primarily detected in lymphoblasts, granulocytes and sperm. Defects in G6PD can cause chronic non-spherocytic hemolytic anemia (CNSHA), especially in areas in which malaria is an epidemic. Individuals with a high level of G6PD-deficiency are at higher risk of acute hemolytic attacks.

CHROMOSOMAL LOCATION

Genetic locus: G6PD (human) mapping to Xq28.

PRODUCT

G6PD 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 G6PD shRNA Plasmid (h): sc-60667-SH and G6PD shRNA (h) Lentiviral Particles: sc-60667-V as alternate gene silencing products.

For independent verification of G6PD (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-60667A, sc-60667B and sc-60667C.

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

G6PD siRNA (h) is recommended for the inhibition of G6PD 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

G6PD (G-12): sc-373886 is recommended as a control antibody for monitoring of G6PD 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 G6PD gene expression knockdown using RT-PCR Primer: G6PD (h)-PR: sc-60667-PR (20 µl, 534 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Huang, Y., et al. 2012. Phospho-ΔNp63α/SREBF1 protein interactions: bridging cell metabolism and cisplatin chemoresistance. Cell Cycle 11: 3810-3827.
2. Wang, X., et al. 2016. G6PD downregulation triggered growth inhibition and induced apoptosis by regulating Stat3 signaling pathway in esophageal squamous cell carcinoma. Tumour Biol. 37: 781-789.
3. Almeida, A.S., et al. 2018. Improvement of neuronal differentiation by carbon monoxide: role of pentose phosphate pathway. Redox Biol. 17: 338-347.
4. Parsanathan, R. and Jain, S.K. 2019. Glucose-6-phosphate dehydrogenase deficiency increases cell adhesion molecules and activates human monocyte-endothelial cell adhesion: protective role of l-cysteine. Arch. Biochem. Biophys. 663: 11-21.
5. Parsanathan, R. and Jain, S.K. 2020. Glucose-6-phosphate dehydrogenase deficiency activates endothelial cell and leukocyte adhesion mediated via the TGFβ/NADPH oxidases/Ros signaling pathway. Int. J. Mol. Sci. 21: 7474.
6. Zhang, Y., et al. 2021. Upregulation of antioxidant capacity and nucleotide precursor availability suffices for oncogenic transformation. Cell Metab. 33: 94-109.e8.
7. Chang, Y.F., et al. 2021. HPV16 E6 promotes the progression of HPV infection-associated cervical cancer by upregulating glucose-6-phosphate dehydrogenase expression. Front. Oncol. 11: 718781.
8. De Angelis, M., et al. 2022. Influenza virus down-modulates G6PD expression and activity to induce oxidative stress and promote its replication. Front. Cell. Infect. Microbiol. 11: 804976.
9. De Falco, P., et al. 2022. Hindering NAT8L expression in hepatocellular carcinoma increases cytosolic aspartate delivery that fosters pentose phosphate pathway and purine biosynthesis promoting cell proliferation. Redox Biol. 59: 102585.
10. Yang, Q., et al. 2023. Reductive stress induced by NRF2/G6PD through glucose metabolic reprogramming promotes malignant transformation in Arsenite-exposed human keratinocytes. Sci. Total Environ. 896: 165207.

RESEARCH USE

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