SANTA CRUZ BIOTECHNOLOGY, INC.

APOBEC3G siRNA (h): sc-60091

BACKGROUND

APOBEC3G (apoplipoprotein B mRNA-editing enzyme, catalytic polypeptide-like 3G) is a member of a family of enzymes that have potent DNA mutator activity. APOBEC3G deaminates deoxycytosine to deoxyuracil in the minus strand of HIV-1 DNA, resulting in G to A hypermutation in the plus strand of DNA. Thus, APOBEC3G provides a mechanism for innate immunity to retroviruses and also likely contributes to sequence variation observed in many viruses. Viral infectivity factor (Vif) imparts APOBEC3G resistance to HIV through impaired translation of APOBEC3G mRNA and accelerated post-translational degradation of APOBEC3G by the 26S Proteasome. Interestingly, HIV-1 Vif cannot form a complex with APOBEC3G of mouse origin as it does with the human protein, and thus mouse APOBEC3G functions as a potent inhibitor of wild type HIV-1 replication, where human APOBEC3G is only able to inhibit Vif-deficient HIV-1 replication. This implies that induction of APOBEC3G activity or a method of blocking its interaction with Vif may provide a method for therapeutic intervention. CEM15 is a 429 amino acid mouse protein that is thought to function as an ortholog of human APOBEC3G.

REFERENCES

1. Zhang, H., et al. 2003. The cytidine deaminase CEM15 induces hypermutation in newly synthesized HIV-1 DNA. Nature 424: 94-98.
2. Mangeat, B., et al. 2003. Broad antiretroviral defence by human APOBEC3G through lethal editing of nascent reverse transcripts. Nature 424: 99-103.
3. Shindo, K., et al. 2003. The enzymatic activity of CEM15/APOBEC3G is essential for the regulation of the infectivity of HIV-1 virion but not a sole determinant of its antiviral activity. J. Biol. Chem. 278: 44412-44416.
4. Stopak, K., et al. 2003. HIV-1 Vif blocks the antiviral activity of APOBEC3G by impairing both its translation and intracellular stability. Mol. Cell 12: 591-601.
5. Harris, R.S., et al. 2003. DNA deamination mediates innate immunity to retroviral infection. Cell 113: 803-809.
6. Kao, S., et al. 2003. The human immunodeficiency virus type 1 Vif protein reduces intracellular expression and inhibits packaging of APOBEC3G (CEM15), a cellular inhibitor of virus infectivity. J. Virol. 77: 11398-11407.

CHROMOSOMAL LOCATION

Genetic locus: APOBEC3G (human) mapping to 22q13.1

PRODUCT

APOBEC3G 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 APOBEC3G shRNA Plasmid (h): sc-60091-SH and APOBEC3G shRNA (h) Lentiviral Particles: sc-60091-V as alternate gene silencing products.

For independent verification of APOBEC3G (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-60091A, sc-60091B and sc-60091C.

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

APOBEC3G siRNA (h) is recommended for the inhibition of APOBEC3G 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.

RT-PCR REAGENTS

Semi-quantitative RT-PCR may be performed to monitor APOBEC3G gene expression knockdown using RT-PCR Primer: APOBEC3G (h)-PR: sc-60091-PR (20 µl, 516 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Zhu, Y.P., et al. 2015. Host APOBEC3G protein inhibits HCV replication through direct binding at NS3. PLoS ONE 10: e0121608.
2. Briand, J., et al. 2019. Diuron exposure and Akt overexpression promote glioma formation through DNA hypomethylation. Clin. Epigenetics 11: 159.
3. Courant, F., et al. 2022. Modulation of DNA methylation/demethylation reactions induced by nutraceuticals and pollutants of exposome can promote a C > T mutation in the breast cancer predisposing gene PALB2. Epigenomes 6: 32.

RESEARCH USE

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

PROTOCOLS

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