SANTA CRUZ BIOTECHNOLOGY, INC.

TK2 siRNA (h): sc-106616

BACKGROUND

Thymidine kinase 2 (TK2) salvages mitochondrial (mt) pyrimidine deoxynucleosides for mtDNA precursor synthesis. TK2 phosphorylates these nucleosides to their corresponding nucleoside monophosphates using a nucleotide triphosphate as a donor. Deficiency of mitochondrial TK2 manifests as severe skeletal myopathy during infancy, due to depletion of mtDNA. Mutant enzyme possesses similar K_m values to wildtype, however, the V_{max} is markedly decreased, leading to the decreased enzyme efficiency, which causes the disease.

REFERENCES

1. Johansson, M., et al. 1997. Cloning of the cDNA and chromosome localization of the gene for human thymidine kinase 2. J. Biol. Chem. 272: 8454-8458.
2. Mancuso, M., et al. 2002. Mitochondrial DNA depletion: mutations in thymidine kinase gene with myopathy and SMA. Neurology 59: 1197-1202.
3. Vila, M.R., et al. 2003. Reversion of mtDNA depletion in a patient with TK2 deficiency. Neurology 60: 1203-1205.
4. Wang, L., et al. 2003. Kinetic properties of mutant thymidine kinase 2 suggest a mechanism for mitochondrial DNA depletion myopathy. J. Biol. Chem. 278: 6963-6968.
5. Barroso, J.F., et al. 2003. Tight binding of deoxyribonucleotide triphosphates to human thymidine kinase 2 expressed in *Escherichia coli*. Purification and partial characterization of its dimeric and tetrameric forms. Biochemistry 42: 15158-15169.
6. Saada, A., et al. 2003. Mitochondrial deoxyribonucleoside triphosphate pools in thymidine kinase 2 deficiency. Biochem. Biophys. Res. Commun. 310: 963-966.
7. Han, T., et al. 2004. 2',3'-dideoxycytidine represses thymidine kinases 1 and 2 expression in T-lymphoid cells. Life Sci. 74: 835-842.

CHROMOSOMAL LOCATION

Genetic locus: TK2 (human) mapping to 16q21.

PRODUCT

TK2 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 TK2 shRNA Plasmid (h): sc-106616-SH and TK2 shRNA (h) Lentiviral Particles: sc-106616-V as alternate gene silencing products.

For independent verification of TK2 (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-106616A, sc-106616B and sc-106616C.

PROTOCOLS

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

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

TK2 siRNA (h) is recommended for the inhibition of TK2 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 TK2 gene expression knockdown using RT-PCR Primer: TK2 (h)-PR: sc-106616-PR (20 µl, 563 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

RESEARCH USE

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