SANTA CRUZ BIOTECHNOLOGY, INC.

Aldose Reductase siRNA (h): sc-37119

BACKGROUND

Aldose Reductase (also designated ALR2) is member of the monomeric NADPH-dependent aldoketoreductase family. Aldose Reductase catalyzes the reduction of various aldehydes and has been implicated in the development of diabetic complications by catalyzing the reduction of the aldehyde form of glucose, to the corresponding sugar alcohol, sorbitol. This pathway plays a minor role in glucose metabolism in most tissues, however in diabetic hyperglycemia, cells undergoing Insulin-independent uptake of glucose accumulate significant quantities of sorbitol. The resulting hyperosmotic stress to cells may be a cause of diabetic complications such as neuropathy, retinopathy, and cataracts. Aldose Reductase is very similar to human aldehyde reductase (designated ALR1), bovine prostaglandin F synthase and to the European common frog protein, ρ-crystallin.

REFERENCES

1. Bohren, K.M., et al. 1989. The aldo-keto reductase superfamily. cDNAs and deduced amino acid sequences of human aldehyde and Aldose Reductases. J. Biol. Chem. 264: 9547-9551.
2. Chung, S. and LaMendola, J. 1989. Cloning and sequence determination of human placental Aldose Reductase gene. J. Biol. Chem. 264: 14775-14777.
3. Nishimura, C., et al. 1990. Cloning and expression of human Aldose Reductase. J. Biol. Chem. 265: 9788-9792.
4. Graham, A., et al. 1991. The human Aldose Reductase gene maps to chromosome region 7q35. Hum. Genet. 86: 509-514.
5. LocusLink Report (LocusID: 231). http://www.ncbi.nlm.nih.gov/LocusLink/

CHROMOSOMAL LOCATION

Genetic locus: AKR1B1 (human) mapping to 7q33.

PRODUCT

Aldose Reductase 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 Aldose Reductase shRNA Plasmid (h): sc-37119-SH and Aldose Reductase shRNA (h) Lentiviral Particles: sc-37119-V as alternate gene silencing products.

For independent verification of Aldose Reductase (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-37119A, sc-37119B and sc-37119C.

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

Aldose Reductase siRNA (h) is recommended for the inhibition of Aldose Reductase 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

Aldose Reductase (H-6): sc-166918 is recommended as a control antibody for monitoring of Aldose Reductase 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 Aldose Reductase gene expression knockdown using RT-PCR Primer: Aldose Reductase (h)-PR: sc-37119-PR (20 µl, 573 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Tang, W.H., et al. 2011. Glucose and collagen regulate human platelet activity through Aldose Reductase induction of thromboxane. J. Clin. Invest. 121: 4462-4476.
2. Zhang, S.Q., et al. 2018. Aldo-keto reductases-mediated cytotoxicity of 2-deoxyglucose: a novel anticancer mechanism. Cancer Sci. 109: 1970-1980.
3. De Paepe, B., et al. 2018. Induction of osmolyte pathways in skeletal muscle inflammation: novel biomarkers for myositis. Front. Neurol. 9: 846.

RESEARCH USE

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