

Dyrk1A siRNA (h): sc-39007

BACKGROUND

Dyrk (for dual specificity tyrosine phosphorylation regulated kinase) is the homolog of the *Drosophila* mnb (minibrain) gene which is required for neurogenesis. Dyrk is a dual-specificity tyrosine kinase and serine/threonine kinase, which is self regulated by tyrosine phosphorylation. Several mammalian Dyrk related proteins have been identified and are thought to compose a family of dual specificity protein kinases. Dyrk family members, including Dyrk1A (dual specificity tyrosine-phosphorylation-regulated kinase 1A), Dyrk1B, Dyrk1C, Dyrk2, Dyrk3, Dyrk4A and Dyrk4B, are thought to be involved in diverse cellular functions. Localized to the nucleus and highly expressed in testis, muscle and the developing nervous system, Dyrk1A, also known as MNB or MNBH, functions to phosphorylate serine, threonine and tyrosine residues on various substrates involved in signaling pathways that regulate cell proliferation. Dyrk1A is a candidate gene for learning defects that are involved in Downs syndrome (DS), suggesting a possible role for Dyrk1A in the development of DS. Four isoforms of Dyrk1A exist due to alternative splicing events.

REFERENCES

1. Kentrup, H., et al. 1996. Dyrk, a dual specificity protein kinase with unique structural features whose activity is dependent on tyrosine residues between subdomains VII and VIII. *J. Biol. Chem.* 271: 3488-3495.
2. Song, W.J., et al. 1996. Isolation of human and murine homologues of the *Drosophila* minibrain gene: human homologue maps to 21q22.2 in the Down syndrome "critical region". *Genomics* 38: 331-339.
3. Shindoh, N., et al. 1996. Cloning of a human homolog of the *Drosophila* minibrain/rat Dyrk gene from "the Down syndrome critical region" of chromosome 21. *Biochem. Biophys. Res. Commun.* 225: 92-99.

CHROMOSOMAL LOCATION

Genetic locus: DYRK1A (human) mapping to 21q22.13.

PRODUCT

Dyrk1A 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 μ M solution once resuspended using protocol below. Suitable for 50-100 transfections. Also see Dyrk1A shRNA Plasmid (h): sc-39007-SH and Dyrk1A shRNA (h) Lentiviral Particles: sc-39007-V as alternate gene silencing products.

For independent verification of Dyrk1A (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-39007A, sc-39007B and sc-39007C.

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 μ l of the RNase-free water provided. Resuspension of the siRNA duplex in 330 μ l of RNase-free water makes a 10 μ M solution in a 10 μ M Tris-HCl, pH 8.0, 20 mM NaCl, 1 mM EDTA buffered solution.

APPLICATIONS

Dyrk1A siRNA (h) is recommended for the inhibition of Dyrk1A 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 μ M in 66 μ l. 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

Dyrk1A (RR.7): sc-100376 is recommended as a control antibody for monitoring of Dyrk1A 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-IgG κ BP-HRP: sc-516102 or m-IgG κ 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-IgG κ BP-FITC: sc-516140 or m-IgG κ 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 Dyrk1A gene expression knockdown using RT-PCR Primer: Dyrk1A (h)-PR: sc-39007-PR (20 μ l, 518 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Qian, W., et al. 2011. Regulation of the alternative splicing of Tau exon 10 by SC35 and Dyrk1A. *Nucleic Acids Res.* 39: 6161-6171.
2. Kadri, F., et al. 2015. HIV-1-Tat protein inhibits SC35-mediated Tau exon 10 inclusion through up-regulation of DYRK1A kinase. *J. Biol. Chem.* 290: 30931-30946.
3. Hutterer, C., et al. 2017. Inhibitors of dual-specificity tyrosine phosphorylation-regulated kinases (Dyrk) exert a strong anti-herpesviral activity. *Antiviral Res.* 143: 113-121.

RESEARCH USE

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