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# AChR $\alpha$ 7 siRNA (h): sc-42532

## BACKGROUND

Members of the ligand-gated ion channel receptor family are characterized by their fast transmitting response to neurotransmitters. Two important members of this family are the nicotinic acetylcholine and glutamate receptors, both of which are composed of five homologous subunits forming a transmembrane aqueous pore. These transmembrane receptors change conformation in response to their cognate neurotransmitter. Nicotinic acetylcholine receptors (AChRs) are found at the postsynaptic membrane of the neuromuscular junction and bind acetylcholine molecules, allowing ions to move through the pore. Glutamate receptors are found in the postsynaptic membrane of cells in the central nervous system. The activity that is generated at the synapse by the binding of acetylcholine is terminated by acetylcholinesterase, an enzyme that rapidly hydrolyzes acetylcholine. AChR $\alpha$ 7, also known as NACHRA7, CHRNA7-2 or CHRNA7, is a 502 amino acid multi-pass membrane protein existing as a homopentamer and interacts with RIC-3, a nicotinic acetylcholine receptor (nAChR)-associated protein.

## CHROMOSOMAL LOCATION

Genetic locus: CHRNA7 (human) mapping to 15q13.3.

## PRODUCT

AChR $\alpha$ 7 siRNA (h) is a target-specific 19-25 nt siRNA designed to knock down gene expression. Each vial contains 3.3 nmol of lyophilized siRNA, sufficient for a 10  $\mu$ M solution once resuspended using protocol below. Suitable for 50-100 transfections. Also see AChR $\alpha$ 7 shRNA Plasmid (h): sc-42532-SH and AChR $\alpha$ 7 shRNA (h) Lentiviral Particles: sc-42532-V as alternate gene silencing 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  $\mu$ l of the RNase-free water provided. Resuspension of the siRNA duplex in 330  $\mu$ l of RNase-free water makes a 10  $\mu$ M solution in a 10  $\mu$ M Tris-HCl, pH 8.0, 20 mM NaCl, 1 mM EDTA buffered solution.

## APPLICATIONS

AChR $\alpha$ 7 siRNA (h) is recommended for the inhibition of AChR $\alpha$ 7 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  $\mu$ M in 66  $\mu$ 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

AChR $\alpha$ 7 (319): sc-58607 is recommended as a control antibody for monitoring of AChR $\alpha$ 7 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 AChR $\alpha$ 7 gene expression knockdown using RT-PCR Primer: AChR $\alpha$ 7 (h)-PR: sc-42532-PR (20  $\mu$ l, 556 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

## SELECT PRODUCT CITATIONS

- Sun, X., et al. 2009. Nicotine stimulates PPAR $\beta$ / $\delta$  expression in human lung carcinoma cells through activation of PI3K/mTOR and suppression of AP-2 $\alpha$ . *Cancer Res.* 69: 6445-6453.
- Chi, F., et al. 2011. Recruitment of  $\alpha$ 7 nicotinic acetylcholine receptor to caveolin-1-enriched lipid rafts is required for nicotine-enhanced *Escherichia coli* K1 entry into brain endothelial cells. *Future Microbiol.* 6: 953-966.
- Qi, X.L., et al. 2013. Preventing expression of the nicotinic receptor subunit  $\alpha$ 7 in SH-SY5Y cells with interference RNA indicates that this receptor may protect against the neurotoxicity of A $\beta$ . *Neurochem. Res.* 38: 943-950.
- Zhong, X., et al. 2015. Novel link between prostaglandin E2 (PGE2) and cholinergic signaling in lung cancer: the role of c-Jun in PGE2-induced  $\alpha$ 7 nicotinic acetylcholine receptor expression and tumor cell proliferation. *Thorac. Cancer* 6: 488-500.
- Fan, Y., et al. 2017. Nicotine induces EP4 receptor expression in lung carcinoma cells by acting on AP-2 $\alpha$ : the intersection between cholinergic and prostanoid signaling. *Oncotarget* 8: 75854-75863.
- Schaal, C.M., et al. 2018. Regulation of Sox2 and stemness by nicotine and electronic-cigarettes in non-small cell lung cancer. *Mol. Cancer* 17: 149.
- Peng, L., et al. 2020. Memantine displays antimicrobial activity by enhancing *Escherichia coli* pathogen-induced formation of neutrophil extracellular traps. *Front. Cell. Infect. Microbiol.* 10: 47.

## RESEARCH USE

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

## PROTOCOLS

See our web site at [www.scbt.com](http://www.scbt.com) for detailed protocols and support products.