SANTA CRUZ BIOTECHNOLOGY, INC.

Sigma Receptor siRNA (h): sc-42250

BACKGROUND

Sigma Receptor, also known as opioid receptor, σ 1 (Oprs 1), acts as a modulatory system influencing the analgesic activity of opioid drugs. For example, activation of the Sigma Receptor is induced during the early effects of cocaine. At the cellular level, Sigma Receptor agonists modulate intracellular calcium mobilization and extracellular calcium influx, NMDA-mediated responses, and acetylcholine release, and alter monoaminergic systems. At the behavioral level, the Sigma Receptor is involved in learning and memory processes, response to stress, depression, neuroprotection and pharmacodependence. Pregnenolone, dehydroepiandrosterone and their sulfate esters behave as Sigma Receptor agonists, while progesterone is a potent antagonist. Sigma Receptor is expressed in the endocrine, immune and other peripheral organ systems, and is expressed in a variety of human tumors. The Sigma Receptor is responsible for the pathogenesis of some psychiatric disorders and may be involved in several diseases of the central nervous system. Opioid analgesia is influenced by many factors, including the Sigma Receptor.

REFERENCES

1. Walker, J.M., et al. 1990. Sigma Receptors: biology and function. Pharmacol. Rev. 42: 355-402.
2. Ferris, C.D., et al. 1991. Sigma Receptors: from molecule to man. J. Neurochem. 57: 729-737.

CHROMOSOMAL LOCATION

Genetic locus: SIGMAR1 (human) mapping to 9p13.3.

PRODUCT

Sigma Receptor 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 Sigma Receptor shRNA Plasmid (h): sc-42250-SH and Sigma Receptor shRNA (h) Lentiviral Particles: sc-42250-V as alternate gene silencing products.

For independent verification of Sigma Receptor (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-42250A, sc-42250B and sc-42250C.

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

Sigma Receptor siRNA (h) is recommended for the inhibition of Sigma Receptor 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

Sigma Receptor (B-5): sc-137075 is recommended as a control antibody for monitoring of Sigma Receptor 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 Sigma Receptor gene expression knockdown using RT-PCR Primer: Sigma Receptor (h)-PR: sc-42250-PR (20 µl, 437 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Kim, F.J., et al. 2010. σ1 receptor modulation of G protein-coupled receptor signaling: potentiation of opioid transduction independent from receptor binding. Mol. Pharmacol. 77: 695-703.
2. Pal, K., et al. 2011. Structure-activity study to develop cationic lipid-conjugated haloperidol derivatives as a new class of anticancer therapeutics. J. Med. Chem. 54: 2378-2390.
3. Zhang, Y., et al. 2015. Role of high-mobility group box 1 in methamphetamine-induced activation and migration of astrocytes. J. Neuroinflammation 12: 156.
4. Huang, R., et al. 2017. Circular RNA HIPK2 regulates astrocyte activation via cooperation of autophagy and ER stress by targeting MIR124-2HG. Autophagy 13: 1722-1741.
5. Maher, C.M., et al. 2018. Small-molecule σ1 modulator induces autophagic degradation of PD-L1. Mol. Cancer Res. 16: 243-255.
6. Liu, D., et al. 2021. Sigma-1 receptor activation alleviates blood-brain barrier disruption post cerebral ischemia stroke by stimulating the GDNF-GFRα1-RET pathway. Exp. Neurol. 347: 113867.
7. Liu, D., et al. 2022. σ-1 receptor activation alleviates blood-brain barrier disruption post cerebral ischemia stroke by stimulating the GDNF-GFRα1-RET pathway. Exp. Neurol. 347: 113867.

RESEARCH USE

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