

# Stat3 siRNA (r): sc-270027

## BACKGROUND

Membrane receptor signaling by various ligands, including interferons and growth hormones such as EGF, induces activation of JAK kinases, which then leads to tyrosine phosphorylation of the various Stat transcription factors. Stat1 and Stat2 are induced by IFN- $\alpha$  and form a heterodimer, which is part of the ISGF-3 transcription factor complex. Although early reports indicate Stat3 activation by EGF and IL-6, it has been shown that Stat3 $\beta$  appears to be activated by both while Stat3 $\alpha$  is activated by EGF, but not by IL-6. Highest expression of Stat4 is seen in testis and myeloid cells. IL-12 has been identified as an activator of Stat4. Stat5 has been shown to be activated by prolactin and by IL-3. Stat6 is involved in IL-4 activated signaling pathways.

## CHROMOSOMAL LOCATION

Genetic locus: Stat3 (rat) mapping to 10q32.1.

## PRODUCT

Stat3 siRNA (r) 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  $\mu$ M solution once resuspended using protocol below. Suitable for 50-100 transfections. Also see Stat3 shRNA Plasmid (r): sc-270027-SH and Stat3 shRNA (r) Lentiviral Particles: sc-270027-V as alternate gene silencing products.

For independent verification of Stat3 (r) gene silencing results, we also provide the individual siRNA duplex components. Each is available as 3.3 nmol of lyophilized siRNA. These include: sc-270027A, sc-270027B and sc-270027C.

## 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

Stat3 siRNA (r) is recommended for the inhibition of Stat3 expression in rat 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

Stat3 (F-2): sc-8019 is recommended as a control antibody for monitoring of Stat3 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 Stat3 gene expression knockdown using RT-PCR Primer: Stat3 (r)-PR: sc-270027-PR (20  $\mu$ l, 578 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

## SELECT PRODUCT CITATIONS

- Heldsinger, A., et al. 2012. Cocaine- and amphetamine-regulated transcript is the neurotransmitter regulating the action of cholecystokinin and leptin on short-term satiety in rats. *Am. J. Physiol. Gastrointest. Liver Physiol.* 303: G1042-G1051.
- Fiaschi, T., et al. 2014. Hyperglycemia and angiotensin II cooperate to enhance collagen I deposition by cardiac fibroblasts through a ROS-Stat3-dependent mechanism. *Biochim. Biophys. Acta* 1843: 2603-2610.
- Xu, J., et al. 2014. Propofol ameliorates hyperglycemia-induced cardiac hypertrophy and dysfunction via heme oxygenase-1/signal transducer and activator of transcription 3 signaling pathway in rats. *Crit. Care Med.* 42: e583-e594.
- Luo, S., et al. 2016. ZYZ451 protects cardiomyocytes from hypoxia-induced apoptosis via enhancing MnSOD and Stat3 interaction. *Free Radic. Biol. Med.* 92: 1-14.
- Yao, W., et al. 2017. SerpinB1 ameliorates acute lung injury in liver transplantation through ERK1/2-mediated Stat3-dependent HO-1 induction. *Free Radic. Biol. Med.* 108: 542-553.
- Li, H.J., et al. 2018. Inhibition of miR-21 ameliorates excessive astrocyte activation and promotes axon regeneration following optic nerve crush. *Neuropharmacology* 137: 33-49.
- Kanno, H., et al. 2018. BC-box motif-mediated neuronal differentiation of somatic stem cells. *Int. J. Mol. Sci.* 19 pii: E466.
- Chen, W.D., et al. 2019. The JAK2/Stat3 signaling pathway is required for inflammation and cell death induced by cerulein in AR42J cells. *Eur. Rev. Med. Pharmacol. Sci.* 23: 1770-1777.
- Koyama, Y., et al. 2019. Endothelin-1 stimulates expression of cyclin D1 and S-phase kinase-associated protein 2 by activating the transcription factor Stat3 in cultured rat astrocytes. *J. Biol. Chem.* 294: 3920-3933.
- Lei, S., et al. 2019. Hyperglycemia-induced oxidative stress abrogates remifentanyl preconditioning-mediated cardioprotection in diabetic rats by impairing caveolin-3-modulated PI3K/Akt and JAK2/Stat3 signaling. *Oxid. Med. Cell. Longev.* 2019: 9836302.

## RESEARCH USE

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