SANTA CRUZ BIOTECHNOLOGY, INC.

JAK2 siRNA (r): sc-270385

BACKGROUND

JAK2 (Janus kinase 2) belongs to the emerging family of non-receptor Janus tyrosine kinases, which regulate a spectrum of cellular functions downstream of activated cytokine receptors in the lympho-hematopoietic system. Immunological stimuli, such as interferons and cytokines, induce recruitment of Stat transcription factors to cytokine receptor-associated JAK2. JAK2 then phosphorylates proximal Stat factors, which subsequently dimerize, translocate to the nucleus and bind to *cis* elements upstream of target gene promoters to regulate transcription. The canonical JAK/Stat pathway is integral to maintaining a normal immune system by stimulating proliferation, differentiation, survival and host resistance to pathogens. Altering JAK/Stat signaling to reduce cytokine induced pro-inflammatory responses represents an attractive target for anti-inflammatory therapies.

REFERENCES

1. Heim, M.H. 1996. The JAK-Stat pathway: specific signal transduction from the cell membrane to the nucleus. Eur. J. Clin. Invest. 26: 1-12.
2. Decker, T., et al. 1997. JAKs, Stats and the immune system. Immunobiology 198: 99-111.
3. Leonard, W.J., et al. 1998. JAKs and Stats: biological implications. Annu. Rev. Immunol. 16: 293-322.

CHROMOSOMAL LOCATION

Genetic locus: Jak2 (rat) mapping to 1q52.

PRODUCT

JAK2 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 µM solution once resuspended using protocol below. Suitable for 50-100 transfections. Also see JAK2 shRNA Plasmid (r): sc-270385-SH and JAK2 shRNA (r) Lentiviral Particles: sc-270385-V as alternate gene silencing products.

For independent verification of JAK2 (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-270385A, sc-270385B and sc-270385C.

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

JAK2 siRNA (r) is recommended for the inhibition of JAK2 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 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

JAK2 (C-10): sc-390539 is recommended as a control antibody for monitoring of JAK2 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 JAK2 gene expression knockdown using RT-PCR Primer: JAK2 (r)-PR: sc-270385-PR (20 µl). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Wang, L., et al. 2015. MicroRNA-101 inhibits proliferation of pulmonary microvascular endothelial cells in a rat model of hepatopulmonary syndrome by targeting the JAK2/Stat3 signaling pathway. Mol. Med. Rep. 12: 8261-8267.
2. Zhao, G.L., et al. 2016. Berberine protects rat heart from ischemia/reperfusion injury via activating JAK2/Stat3 signaling and attenuating endoplasmic reticulum stress. Acta Pharmacol. Sin. 37: 354-367.
3. Zhou, Y., et al. 2017. IL-5 blocks apoptosis and Tau hyperphosphorylation induced by $A\beta_{25-35}$ peptide in PC12 cells. J. Physiol. Biochem. 73: 259-266.
4. Song, D., et al. 2018. Hydrogen-rich solution against myocardial injury and aquaporin expression via the PI3K/Akt signaling pathway during cardiopulmonary bypass in rats. Mol. Med. Rep. 18: 1925-1938.
5. 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.

RESEARCH USE

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