



# TLR7 siRNA (h): sc-40266

## BACKGROUND

The Toll-like receptors (TLR) are a family of human receptors that share homology with the *Drosophila* Toll receptors, which are involved in mediating dorsoventral polarization in developing *Drosophila* embryos and participate in host immunity. The TLR family members are characterized by a highly conserved Toll homology (TH) domain, which is essential for Toll-induced signal transductions. TLRs are type I transmembrane receptors that contain an extracellular domain consisting of several leucine-rich regions and a single cytoplasmic Toll/IL-1R like domain. Three TLR family members, TLR7, TLR8 and TLR9, belong to a subfamily of TLRs which are differentially expressed. TLR7 is expressed in lung, placenta and spleen. TLR8 is expressed in lung and peripheral blood leukocytes, and TLR9 is predominantly expressed in spleen, lymph nodes, bone marrow and peripheral blood leukocytes. TLR7, TLR8 and TLR9 stimulate the NF $\kappa$ B signaling pathway, suggesting that they play a role in the immune response.

## REFERENCES

1. Gay, N.J. and Keith, F.J. 1991. *Drosophila* Toll and IL-1 receptor. Nature 351: 355-356.
2. Rock, F.L., et al. 1998. A family of human receptors structurally related to *Drosophila* Toll. Proc. Natl. Acad. Sci. USA 95: 588-593.
3. Brightbill, H.D., et al. 1999. Host defense mechanisms triggered by microbial lipoproteins through Toll-like receptors. Science 285: 732-736.

## CHROMOSOMAL LOCATION

Genetic locus: TLR7 (human) mapping to Xp22.2.

## PRODUCT

TLR7 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  $\mu$ M solution once resuspended using protocol below. Suitable for 50-100 transfections. Also see TLR7 shRNA Plasmid (h): sc-40266-SH and TLR7 shRNA (h) Lentiviral Particles: sc-40266-V as alternate gene silencing products.

For independent verification of TLR7 (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-40266A, sc-40266B and sc-40266C.

## 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

TLR7 siRNA (h) is recommended for the inhibition of TLR7 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

TLR7 (C-1): sc-518178 is recommended as a control antibody for monitoring of TLR7 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 TLR7 gene expression knockdown using RT-PCR Primer: TLR7 (h)-PR: sc-40266-PR (20  $\mu$ l, 461 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

## SELECT PRODUCT CITATIONS

1. Zhang, X., et al. 2009. IFN- $\beta$ 1a inhibits the secretion of Th17-polarizing cytokines in human dendritic cells via TLR7 up-regulation. J. Immunol. 182: 3928-3936.
2. Chiang, C., et al. 2015. Sequence-specific modifications enhance the broad-spectrum antiviral response activated by RIG-I agonists. J. Virol. 89: 8011-8025.
3. Chen, J., et al. 2016. Vitamin D deficiency promotes liver tumor growth in transforming growth factor- $\beta$ /Smad3-deficient mice through Wnt and Toll-like receptor 7 pathway modulation. Sci. Rep. 6: 30217.
4. Parthasarathy, G. and Philipp, M.T. 2018. Intracellular TLR7 is activated in human oligodendrocytes in response to *Borrelia burgdorferi* exposure. Neurosci. Lett. 671: 38-42.
5. Huang, Y., et al. 2019. TLR7 mediates increased vulnerability to ischemic acute kidney injury in diabetes. Rev. Assoc. Med. Bras. 65: 1067-1073.
6. Zhu, S., et al. 2021. GDF15 promotes glioma stem cell-like phenotype via regulation of ERK1/2-c-Fos-LIF signaling. Cell Death Discov. 7: 3.
7. Yu, H., et al. 2022. DnaJ-induced TLR7 mediates an increase in interferons through the TLR4-engaged AKT/NF $\kappa$ B and JNK signaling pathways in macrophages. Microb. Pathog. 165: 105465.
8. Umar, S., et al. 2022. Inhibition of IRAK4 dysregulates SARS-CoV-2 spike protein-induced macrophage inflammatory and glycolytic reprogramming. Cell. Mol. Life Sci. 79: 301.

## RESEARCH USE

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