

# OPN1SW siRNA (h): sc-40142

## BACKGROUND

G protein-coupled receptors (GPCRs), which are characterized by containing seven transmembrane  $\alpha$  helices, elicit G protein-mediated signaling cascades in response to a variety of stimuli. The opsin subfamily, which represents approximately 90 percent of all GPCRs, is comprised of photoreceptors that are activated by light. It includes the red, green and blue-sensitive opsins and rhodopsin. The opsin subfamily consists of an apoprotein covalently linked to 11-*cis*-retinal, which undergoes isomerization upon the absorption of photons. This isomerization leads to a conformational change of the protein, which results in the activation of hundreds of G proteins. Color is perceived in humans by three pigments, which localize to retinal cone photoreceptor cells. They are the blue-, green- and red-sensitive opsins, which are encoded by OPN1SW, OPN1MW and OPN1LW, respectively. Mutations in the OPN1MW and OPN1LW encoded opsins lead to the X-linked disorders protanopia and deuteranopia, respectively. Mutations in the OPN1SW encoded opsin leads to tritanopia, an autosomal dominant disorder, which is characterized by decreased sensitivity to blue light.

## REFERENCES

1. Fung, B.K., et al. 1980. Flow of information in the light-triggered cyclic nucleotide cascade of vision. *Proc. Natl. Acad. Sci. USA* 78: 152-156.
2. Hargrave, P.A., et al. 1983. The structure of bovine rhodopsin. *Biophys. Struct. Mech.* 9: 235-244.
3. Drummond-Borg, M., et al. 1988. Molecular basis of abnormal red-green color vision: a family with three types of color vision defects. *Am. J. Hum. Genet.* 43: 675-683.
4. Oprian, D.D., et al. 1991. Design, chemical synthesis, and expression of genes for the three human color vision pigments. *Biochemistry* 30: 11367-11372.
5. Weitz, C.J., et al. 1992. Human tritanopia associated with two amino acid substitutions in the blue-sensitive opsin. *Am. J. Hum. Genet.* 50: 498-507.
6. Merbs, S.L. and Nathans, J. 1992. Absorption spectra of human cone pigments. *Nature* 356: 433-435.

## CHROMOSOMAL LOCATION

Genetic locus: OPN1SW (human) mapping to 7q32.1.

## PRODUCT

OPN1SW 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 OPN1SW shRNA Plasmid (h): sc-40142-SH and OPN1SW shRNA (h) Lentiviral Particles: sc-40142-V as alternate gene silencing products.

For independent verification of OPN1SW (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-40142A, sc-40142B and sc-40142C.

## 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

OPN1SW siRNA (h) is recommended for the inhibition of OPN1SW 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

OPN1SW (1B10): sc-517304 is recommended as a control antibody for monitoring of OPN1SW 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-IgG $\kappa$  BP-HRP: sc-516102 or m-IgG $\kappa$  BP-HRP (Cruz Marker): sc-516102-CM (dilution range: 1:1000-1:10000), Cruz Marker<sup>™</sup> Molecular Weight Standards: sc-2035, UltraCruz<sup>®</sup> Blocking Reagent: sc-516214 and Western Blotting Luminol Reagent: sc-2048. 2) Immunofluorescence: use m-IgG $\kappa$  BP-FITC: sc-516140 or m-IgG $\kappa$  BP-PE: sc-516141 (dilution range: 1:50-1:200) with UltraCruz<sup>®</sup> Mounting Medium: sc-24941 or UltraCruz<sup>®</sup> Hard-set Mounting Medium: sc-359850.

## RT-PCR REAGENTS

Semi-quantitative RT-PCR may be performed to monitor OPN1SW gene expression knockdown using RT-PCR Primer: OPN1SW (h)-PR: sc-40142-PR (20  $\mu$ l). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

## SELECT PRODUCT CITATIONS

1. Wu, Q., et al. 2020. Solar light induces the release of acetylcholine from skin keratinocytes affecting melanogenesis. *FASEB J.* 34: 8941-8958.

## RESEARCH USE

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