Small Molecules

9-cis Retinoic Acid

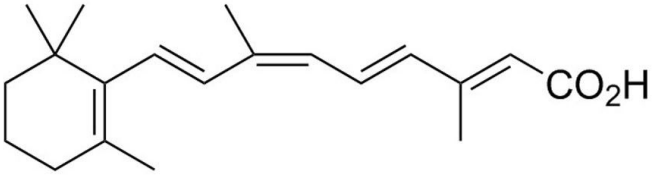
Retinoid pathway activator; Activates retinoic acid receptor (RAR) and retinoid X receptor (RXR)

Catalog #	72382	5 mg
	72384	25 mg

STEMCELL™ TECHNOLOGIES
Scientists Helping Scientists™ | WWW.STEMCELL.COM
TOLL FREE PHONE 1 800 667 0322 • PHONE +1 604 877 0713
INFO@STEMCELL.COM • TECHSUPPORT@STEMCELL.COM
FOR GLOBAL CONTACT DETAILS VISIT OUR WEBSITE

Product Description

9-cis-Retinoic Acid is a natural metabolite of vitamin A, derived from the intermediate All-Trans Retinoic Acid (Catalog #72262) (Kane). It potently activates all isoforms of retinoic acid receptor (RAR; Ki = 0.5 - 27 nM) as well as retinoid X receptor (RXR; Ki = 3.8 - 12 nM) isoforms (Umemiya et al.; Wong et al.). RAR heterodimerizes with RXR, while RXR can homodimerize as well as heterodimerize with numerous partners in addition to RAR, thus allowing 9-cis-Retinoic Acid to evoke a wide range of effects (Dawson et al.; Kane).

Molecular Name:	9-cis Retinoic Acid
Alternative Names:	9-cis-retinoic acid; Aliretinoin; NSC 659772; Panretin
CAS Number:	5300-03-8
Chemical Formula:	$C_{20}H_{28}O_2$
Molecular Weight:	300.4 g/mol
Purity:	≥ 90%
Chemical Name:	(2E,4E,6Z,8E)-3,7-dimethyl-9-(2,6,6-trimethylcyclohexen-1-yl)nona-2,4,6,8-tetraenoic acid
Structure:	

Properties

Physical Appearance:	A crystalline solid
Storage:	Product stable at -20°C as supplied. Protect from prolonged exposure to light. Stable as supplied for 12 months from date of receipt.
Solubility:	· Absolute ethanol ≤ 1.6 mM · DMSO ≤ 65 mM

For example, to prepare a 10 mM stock solution in DMSO, resuspend 1 mg in 333 µL of DMSO.

Prepare stock solution fresh before use. Information regarding stability of small molecules in solution has rarely been reported; however, as a general guide we recommend storage in DMSO at -20°C. Aliquot into working volumes to avoid repeated freeze-thaw cycles. The effect of storage of stock solution on compound performance should be tested for each application.

Compound has low solubility in aqueous media. For use as a cell culture supplement, stock solution should be diluted into culture medium immediately before use. Avoid final DMSO concentration above 0.1% due to potential cell toxicity.

Published Applications

DIFFERENTIATION

· Increases the number of neurons derived from rat neural stem cell cultures (Laeng et al.).
· Promotes oligodendrocyte precursor cell differentiation and myelination in cultured cells and mouse cerebellar slices (Huang et al.).
· Induces formation of pancreatic ducts, but not acini, in embryonic mouse pancreas grown in collagen gel (Kadison et al.; Kobayashi et al.).
· Enhances BMP9-induced osteogenic differentiation of mesenchymal progenitor cells, in vitro and in vivo (Zhang et al.).
· Induces myogenic differentiation of C2C12 myoblast progenitor cells (Zhu et al.).

CANCER RESEARCH

· Inhibits proliferation of Epstein-Barr virus-infected lymphoblastoid cell lines (Pomponi et al.).
· Inhibits growth of cultured human gastric cancer cells (Naka et al.).
· Inhibits spontaneous proliferation and CD40-induced growth in primary mantle cell lymphoma cells (Guidoboni et al.).

References

Dawson MI & Xia Z. (2012) The retinoid X receptors and their ligands. Biochim Biophys Acta 1821(1): 21–56.
Guidoboni M et al. (2005) Retinoic Acid Inhibits the Proliferative Response Induced by CD40 Activation and Interleukin-4 in Mantle Cell Lymphoma. Cancer Res 65(2): 587–595.
Huang JK et al. (2011) Retinoid X receptor gamma signaling accelerates CNS remyelination. Nat Neurosci 14(1): 45–53.
Kadison A et al. (2001) Retinoid signaling directs secondary lineage selection in pancreatic organogenesis. J Pediatr Surg 36(8): 1150–6.
Kane MA. (2012) Analysis, occurrence, and function of 9-cis-retinoic acid. Biochim Biophys Acta 1821(1): 10–20.
Kobayashi H et al. (2002) Retinoid signaling controls mouse pancreatic exocrine lineage selection through epithelial–mesenchymal interactions. Gastroenterology 123(4): 1331–1340.
Laeng P et al. (2004) The mood stabilizer valproic acid stimulates GABA neurogenesis from rat forebrain stem cells. J Neurochem 91(1): 238–51.
Naka K et al. (1997) Growth inhibition of cultured human gastric cancer cells by 9-cis-retinoic acid with induction of cdk inhibitor Waf1/Cip1/Sdi1/p21 protein. Differentiation 61(5): 313–20.
Pomponi F et al. (1996) Retinoids irreversibly inhibit in vitro growth of Epstein-Barr virus-immortalized B lymphocytes. Blood 88(8): 3147–59.
Umemiya H et al. (1997) Regulation of retinoidal actions by diazepinylbenzoic acids. Retinoid synergists which activate the RXR-RAR heterodimers. J Med Chem 40(26): 4222–34.
Wong MF et al. (1997) Synthesis and receptor binding affinity of conformationally restricted retinoic acid analogues. Bioorg Med Chem Lett 7(17): 2313–2318.
Zhang W et al. (2010) Retinoic Acids Potentiate BMP9-Induced Osteogenic Differentiation of Mesenchymal Progenitor Cells R. Linden (Ed.). PLoS One 5(7): e11917.
Zhu G-H et al. (2009) Activation of RXR and RAR signaling promotes myogenic differentiation of myoblastic C2C12 cells. Differentiation 78(4): 195–204.

Related Small Molecules

For a complete list of small molecules available from STEMCELL Technologies, visit www.stemcell.com/smallmolecules or contact us at techsupport@stemcell.com.

This product is hazardous. Please refer to the Safety Data Sheet (SDS).