Small Molecules

All-Trans Retinoic Acid

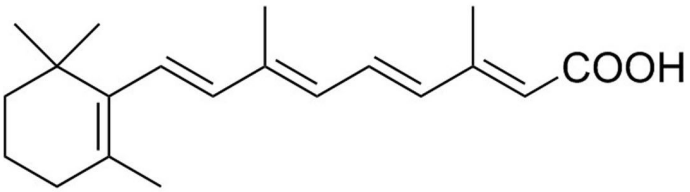
Retinoid pathway activator; Activates retinoic acid receptor (RAR)

Catalog #	72262	50 mg
	72264	500 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

All-Trans Retinoic Acid is a derivative of Vitamin A that functions as a ligand for the retinoic acid receptor (RAR; IC_{50} = 14 nM). These receptors heterodimerize with retinoid X receptors (RXRs) and bind to retinoic acid response elements (RAREs) in DNA where they act as transcription factors, altering gene expression (Apfel et al.; Chambon).

Molecular Name:	All-Trans Retinoic Acid
Alternative Names:	ATRA; NSC 122758; Retinoic acid; Trans retinoic acid; Tretinoin; Vitamin A acid
CAS Number:	302-79-4
Chemical Formula:	$C_{20}H_{28}O_2$
Molecular Weight:	300.4 g/mol
Purity:	≥ 98%
Chemical Name:	Not applicable
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:	· DMSO ≤ 65 mM · Absolute ethanol ≤ 2 mM For example, to prepare a 10 mM stock solution in DMSO, resuspend 10 mg in 3.33 mL of fresh 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
· Promotes differentiation of motor neurons from mouse and human pluripotent stem cells (Dimos et al.; Wichterle et al.).
· Promotes differentiation of neurons from neural stem cells (Takahashi et al.).
· Promotes differentiation of pancreatic progenitors from human embryonic stem (ES) cells (D'Amour et al.).
· Promotes differentiation of adipocytes from mouse ES cells (Dani et al.).
· Promotes differentiation of ventricular cardiomyocytes from mouse ES cells (Wobus et al.).
· Promotes terminal differentiation of granulocytes (Collins).
CANCER RESEARCH
· Promotes maturation of blast cells in differentiation therapy of acute promyelocytic leukemia (Huang et al.).

References

Apfel C et al. (1992) A retinoic acid receptor alpha antagonist selectively counteracts retinoic acid effects. Proc Natl Acad Sci USA 89(15): 7129–33.
Chambon P. (1996) A decade of molecular biology of retinoic acid receptors. FASEB J 10(9): 940–54.
Collins SJ. (2002) The role of retinoids and retinoic acid receptors in normal hematopoiesis. Leukemia 16(10): 1896–905.
D'Amour KA et al. (2006) Production of pancreatic hormone-expressing endocrine cells from human embryonic stem cells. Nat Biotechnol 24(11): 1392–401.
Dani C et al. (1997) Differentiation of embryonic stem cells into adipocytes in vitro. J Cell Sci 110 (Pt 1): 1279–85.
Dimos JT et al. (2008) Induced pluripotent stem cells generated from patients with ALS can be differentiated into motor neurons. Science 321(5893): 1218–21.
Huang ME et al. (1988) Use of all-trans retinoic acid in the treatment of acute promyelocytic leukemia. Blood 72(2): 567–72.
Takahashi J et al. (1999) Retinoic acid and neurotrophins collaborate to regulate neurogenesis in adult-derived neural stem cell cultures. J Neurobiol 38(1): 65–81.
Wichterle H et al. (2002) Directed differentiation of embryonic stem cells into motor neurons. Cell 110(3): 385–97.
Wobus AM et al. (1997) Retinoic acid accelerates embryonic stem cell-derived cardiac differentiation and enhances development of ventricular cardiomyocytes. J Mol Cell Cardiol 29(6): 1525–39.

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).