

Small Molecules

All-Trans Retinoic Acid

Retinoid pathway activator; Activates retinoic acid receptor (RAR)

Catalog # 72262
72264

50 mg
500 mg



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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; Tretinoïn; Vitamin A acid

CAS Number: 302-79-4

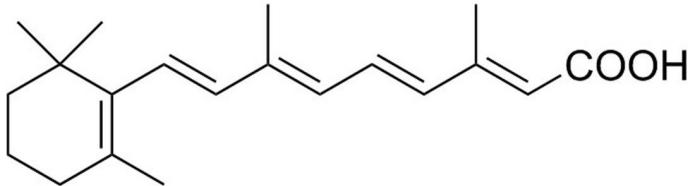
Chemical Formula: $C_{20}H_{28}O_2$

Molecular Weight: 300.4 g/mol

Purity: $\geq 98\%$

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. For product expiry date, please contact techsupport@stemcell.com.

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

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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.

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Wichterle H et al. (2002) Directed differentiation of embryonic stem cells into motor neurons. *Cell* 110(3): 385–97.

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Related Small Molecules

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