

Certificate of Analysis

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Product Name: Retinoic acid

Catalog No.: 0695

Batch No.: 3

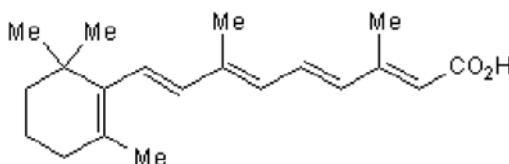
CAS Number: 302-79-4

EC Number: 206-129-0

IUPAC Name: 3,7-Dimethyl-9-(2,6,6-trimethyl-1-cyclohexen-1-yl)-2E,4E,6E,8E,-nonatetraenoic acid

1. PHYSICAL AND CHEMICAL PROPERTIES

Batch Molecular Formula: C₂₀H₂₈O₂
Batch Molecular Weight: 300.44
Physical Appearance: Yellow solid
Solubility: DMSO to 25 mM
ethanol to 10 mM
Storage: Store at -20°C
Batch Molecular Structure:



2. ANALYTICAL DATA

HPLC: Shows 99.7% purity
¹H NMR: Consistent with structure
Mass Spectrum: Consistent with structure
Microanalysis:

	Carbon	Hydrogen	Nitrogen
Theoretical	79.96	9.39	
Found	79.78	9.37	

Caution - Not Fully Tested • Research Use Only • Not For Human or Veterinary Use

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Description:

Endogenous agonist for retinoic acid receptors ($IC_{50} = 14$ nM for RAR α , RAR β and RAR γ receptors). Also promotes differentiation of mouse embryonic stem cells (ESCs) into adipocytes, neurons and glia in vitro. Proposed ligand of ROR β ($K_d = 280$ nM). Activates autophagy.

Physical and Chemical Properties:

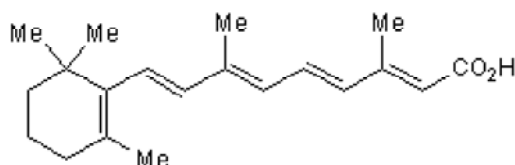
Batch Molecular Formula: C₂₀H₂₈O₂

Batch Molecular Weight: 300.44

Physical Appearance: Yellow solid

Minimum Purity: >99%

Batch Molecular Structure:



Storage: Store at -20°C

CAUTION - This product is light sensitive and we recommend that the solid material and any solutions obtained are protected from exposure to light.

Solubility & Usage Info:

DMSO to 25 mM

ethanol to 10 mM

Stability and Solubility Advice:

Some solutions can be difficult to obtain and can be encouraged by rapid stirring, sonication or gentle warming (in a 45-60°C water bath).

Information concerning product stability, particularly in solution, has rarely been reported and in most cases we can only offer a general guide. Our standard recommendations are:

SOLIDS: Provided storage is as stated on the product label and the vial is kept tightly sealed, the product can be stored for up to 6 months from date of receipt.

SOLUTIONS: We recommend that stock solutions, once prepared, are stored aliquoted in tightly sealed vials at -20°C or below and used within 1 month. Wherever possible solutions should be made up and used on the same day.

References:

Galluzzi et al (2017) Pharmacological modulation of autophagy: therapeutic potential and persisting obstacles. *Nat.Rev.Drug.Discov.* PMID: 28529316.

Lancaster et al (2015) Generation of Cerebral Organoids from Human Pluripotent Stem Cells *Nat. Protoc.* **9** 2329. PMID: 25188634.

Kadoshima et al (2013) Self-organization of axial polarity, inside-out layer pattern, and species-specific progenitor dynamics in human ES cell-derived neocortex. *Proc.Natl.Acad.Sci.USA.* **110** 20284. PMID: 24277810.

Stehlin-Gaon et al (2003) All-trans retinoic acid is a ligand for the orphan nuclear receptor ROR β . *Nat.Struct.Biol.* **10** 820. PMID: 12958591.

Dani et al (1997) Differentiation of embryonic stem cells into adipocytes in vitro. *J. Cell Sci.* **110** 1279. PMID: 9202388.

Sanquer and Gilchrest (1994) Characterisation of human cellular retinoic acid binding proteins-1 and -2: ligand binding affinities and distribution in skin. *Arch.Biochem.Biophys.* **311** 86. PMID: 8185324.

Apfel et al (1992) A retinoic acid receptor alpha antagonist selectively counteracts retinoic acid effects. *Proc.Natl.Acad.Sci.U.S.A.* **89** 7129. PMID: 1323127.

Merck Index **12** 8333.

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