Forskolin is a cell permeable diterpene that directly activates adenylyl cyclase \( (IC_{50} = 41 \text{ nM}) \), the enzyme that produces cyclic adenosine monophosphate (cAMP), which as a result raises cAMP levels in the cell. cAMP is an important second messenger involved in many signal transduction pathways, including activation of protein kinase A (PKA; Awad et al.; Robbins et al.).

**Chemical Name:** 5-(acetyloxy)-3-ethenyldodecahydro-6,10,10b-trihydroxy-3,4a,7,7,10a-pentamethyl-(3R,4aR,5S,6S,6aS,10S,10aR,10bS)-1H-Naphtho[2,1-b]pyran-1-one

**Molecular Name:** Forskolin

**CAS Number:** 66575-29-9

**Chemical Formula:** \( C_{22}H_{34}O_7 \)

**Molecular Weight:** 410.5 g/mol

**Purity:** \( \geq 98\% \)

**Physical Appearance:** A crystalline solid

**Storage:** Product stable at -20°C as supplied. Protect from prolonged exposure to light.

**Solubility:**
- DMSO \( \leq 70 \text{ mM} \)
- Absolute ethanol \( \leq 35 \text{ mM} \)

For example, to prepare a 10 mM stock solution in DMSO, resuspend 1 mg in 244 µL 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

REPROGRAMMING

- Enables chemical reprogramming (without genetic factors) of mouse embryonic fibroblasts to induced pluripotent stem (iPS) cells, in combination with CHIR99021 (Catalog #72052), Tranylcypromine (Catalog #72272), Valproic Acid (Catalog #72292), 3-Deazaadenosine (Catalog #72322), and RepSox (Catalog #73792) (Hou et al.).
- Enables NGN2-mediated transdifferentiation of human fibroblasts to cholinergic neurons (Liu et al.).
- Direct lineage reprogramming of fibroblasts to mature neurons, in combination with RepSox, CHIR99021, SP600125 (Catalog #72642), Valproic Acid, G66983, and Y-27632 (Catalog #72302) (Hu et al.).
- Direct lineage reprogramming of fibroblasts to mature neurons, in combination with CHIR99021, ISX-9 (Catalog #73202), SB431542 (Catalog #72232), and I-BET151 (Catalog #73712) (Li et al.).
- Converts human embryonic stem (ES) cells in a naïve or ground state similar to mouse ES cells, in combination with LIF (Catalog #78055), FGF2, TGFβ and small molecules PD0325901 (Catalog #72182), CHIR99021, SP600125, and SB203580 (Catalog #72222) (Hanna et al.).

DIFFERENTIATION

- Potentiates neuronal differentiation of rat hippocampal neural progenitor cells (Hsiez et al.; Palmer et al.).

References


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).