Small Molecules

Calcitriol

Vitamin D receptor activator

Catalog # 72412

1 mg

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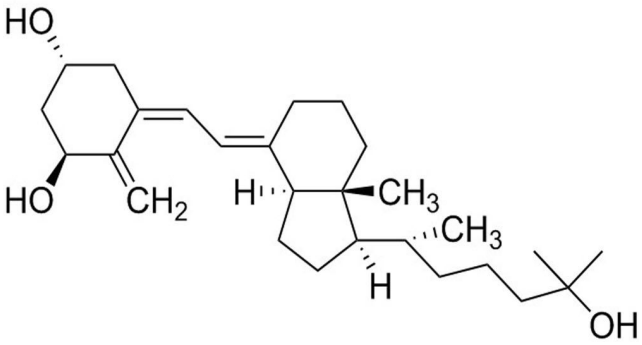
Product Description

Calcitriol is synthesized from 25-hydroxy vitamin D3, the principal circulating form of vitamin D, via hydroxylation in the kidney. Plasma calcitriol levels range from 10 - 70 pg/mL and are influenced by numerous dietary and hormonal factors (Bikle et al.). The main physiologic effects of calcitriol are to increase the absorption of calcium at the level of the intestinal epithelium, and to increase the mineralization of bone via the direct stimulation of osteoblasts (Portale et al.).

Molecular Name:	Calcitriol
Alternative Names:	1α,25-dihydroxy vitamin D_3
CAS Number:	32222-06-3
Chemical Formula:	$C_{27}H_{44}O_3$
Molecular Weight:	416.6 g/mol
Purity:	≥ 97%
Chemical Name:	9,10-secocholesta-5Z,7E,10(19)-triene-1α,3β,25-triol
Structure:	

Properties

Physical Appearance:	A crystalline solid
Storage:	Product stable at -20°C as supplied. Protect from prolonged exposure to light. Product is air sensitive; handle under inert conditions. Stable as supplied for 12 months from date of receipt.
Solubility:	· Absolute ethanol ≤ 2.4 mM For example, to prepare a 1 mM stock solution in absolute ethanol, resuspend 1 mg in 2.40 mL of absolute ethanol. 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 absolute ethanol 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 ethanol concentration above 0.1% due to potential cell toxicity.

Published Applications

DIFFERENTIATION
· Induces differentiation of human osteoblasts, alone or in combination with TGF-β (Ingram et al.; Kassem et al.; Wergedal et al.).
· Induces differentiation of chicken embryonic chondrocytes (Gerstenfeld et al.; Tsonis).
· Enhances differentiation of human keratinocytes when grown in the presence of high calcium concentrations (Itin et al.).

References

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Ingram RT et al. (1994) Effects of transforming growth factor beta (TGFβ) and 1,25 dihydroxyvitamin D3 on the function, cytochemistry and morphology of normal human osteoblast-like cells. Differentiation 55(2): 153–63.
Itin PH et al. (1994) Effects of vitamin D metabolites on proliferation and differentiation of cultured human epidermal keratinocytes grown in serum-free or defined culture medium. Endocrinology 135(5): 1793–8.
Kassem M et al. (2000) Production and action of transforming growth factor-beta in human osteoblast cultures: dependence on cell differentiation and modulation by calcitriol. Eur J Clin Invest 30(5): 429–37.
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Tsonis PA. (1991) 1,25-Dihydroxyvitamin D3 stimulates chondrogenesis of the chick limb bud mesenchymal cells. Dev Biol 143(1): 130–4.
Wergedal JE et al. (1992) Differentiation of normal human bone cells by transforming growth factor-β and 1,25(OH)2 vitamin D3. Metabolism 41(1): 42–8.

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