

Product Data Sheet

Product Name: 7-Dehydrocholesterol

Cat. No.: GC33450

Chemical Properties

Cas. No. 434-16-2

Chemical Name
cholesta-5,7-dien-3 β -ol

SMILES CC(C)CCC[C@@H](C)[C@H]1CC[C@@]2([H])C3=CC=C4C[C@@H](O)CC[C@]4(C)[C@@]3([H])CC[C@]12C

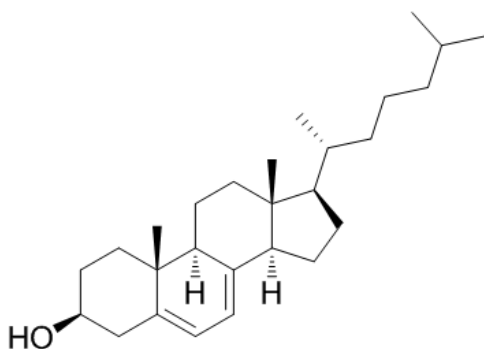
Formula $C_{27}H_{44}O$ M.Wt 384.64

Solubility Ethanol: 16.67 mg/mL (43.34 mM); Storage Store at -20°C
DMSO: < 1 mg/mL (insoluble or slightly soluble)

General tips For obtaining a higher solubility, please warm the tube at 37 °C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.

Shipping Condition Evaluation sample solution: ship with blue ice All other available size: ship with RT, or blue ice upon request.

Structure



Background

7-Dehydrocholesterol (7-DHC) is a precursor of cholesterol and vitamin D, and is converted to

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vitamin D₃ in the skin upon exposure to ultraviolet B (UVB) light [1, 2]. 7-Dehydrocholesterol is a natural anti-ferroptotic metabolite that protects cells by preventing lipid peroxidation, a key process in ferroptosis[3]. 7-Dehydrocholesterol accumulates in Smith-Lemli-Opitz syndrome (SLOS), a disease caused by mutations in the DHCR7 gene, characterized by low cholesterol levels in tissues and body fluids, microcephaly, intellectual disability, and distinctive physical features[4, 5]. 7-Dehydrocholesterol can be converted to 7-ketocholesterol by human cytochrome P450 7A1 (CYP7A1)[6].

References:

- [1] Lehmann B, Genehr T, Knuschke P, et al. UVB-induced conversion of 7-dehydrocholesterol to 1 α , 25-dihydroxyvitamin D₃ in an in vitro human skin equivalent model[J]. Journal of investigative dermatology, 2001, 117(5): 1179-1185.
- [2] Shin M H, Lee Y, Kim M K, et al. UV increases skin-derived 1 α , 25-dihydroxyvitamin D₃ production, leading to MMP-1 expression by altering the balance of vitamin D and cholesterol synthesis from 7-dehydrocholesterol[J]. The Journal of Steroid Biochemistry and Molecular Biology, 2019, 195: 105449.
- [3] Li Y, Ran Q, Duan Q, et al. 7-Dehydrocholesterol dictates ferroptosis sensitivity[J]. Nature, 2024, 626(7998): 411-418.
- [4] Waterham H R, Wanders R J A. Biochemical and genetic aspects of 7-dehydrocholesterol reductase and Smith-Lemli-Opitz syndrome[J]. Biochimica et Biophysica Acta (BBA)-Molecular and Cell Biology of Lipids, 2000, 1529(1-3): 340-356.
- [5] Bianconi S E, Cross J L, Wassif C A, et al. Pathogenesis, epidemiology, diagnosis and clinical aspects of Smith–Lemli–Opitz syndrome[J]. Expert opinion on orphan drugs, 2015, 3(3): 267-280.
- [6] Shinkyo R, Xu L, Tallman K A, et al. Conversion of 7-dehydrocholesterol to 7-ketocholesterol is catalyzed by human cytochrome P450 7A1 and occurs by direct oxidation without an epoxide intermediate[J]. Journal of Biological Chemistry, 2011, 286(38): 33021-33028.

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