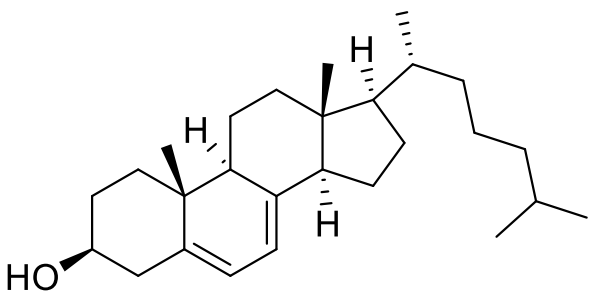
7-Dehydrocholesterol (7-DHC)

Catalog number: L-6004



Molecular Formula: $C_{27}H_{44}O$

MW: 384.65

CAS#: 434-16-2

Alternate Names: (3S,9S,10R,13R,14R,17R)-10,13-dimethyl-17-((R)-6-methylheptan-2-yl)-2,3,4,9,10,11,12,13,14,15,16,17-dodecahydro-1H-cyclopenta[a]phenanthren-3-ol,

Solubility: ~200 mg/mL chloroform, 20 mg/mL ethanol

Storage and Handling: Store at – 20 ^{0}C. Stock solution should be stored frozen (-20^{0}C or below).

Background: 7-Dehydrocholesterol (7-DHC) is an endogenous sterol that serves as a precursor to both cholesterol, through the enzyme 7-dehydrocholesterol reductase (DHCR7), and vitamin D3 by exposure to UVB radiation. Mutations in the DHCR7 gene can lead to the genetic disorder Smith-Lemli-Opitz Syndrome (SLOS). Substituting sterols for cholesterol in lipid nanoparticle (LNP) formulations can influence morphology, internal structure, and endosomal escape. These analogs can result in substantial increases in gene delivery via LNPs.

References:

1) J. A. MacLaughlin *et al.*, “Spectral Character of Sunlight Modulates Photosynthesis of Previtamin D_3 and Its Photoisomers in Human Skin.” *Science 1982,* 216,1001-1003.
2) Wassif CA, Maslen C, Kachilele-Linjewile S, Lin D, Linck LM, Connor WE, et al. "Mutations in the human sterol delta7-reductase gene at 11q12-13 cause Smith-Lemli-Opitz syndrome". American Journal of Human Genetics. 1988, 63 (1): 55–62.
3) M. Herrera et al, “Illuminating endosomal escape of polymorphic lipid nanoparticles that boost mRNA delivery” Biomaterials Science, 2021, 9:4289-4300
4) S. Patel et al, “Naturally-occurring cholesterol analogues in lipid nanoparticles induce polymorphic shape and enhance intracellular delivery of mRNA” Nature communication, 2020, 11, 983

Ph: 866-588-0455 Fax: 801-588-0497 **echelon-inc.com**