# PRODUCT INFORMATION

## Cholic Acid-$d_4$

*Item No. 20849*

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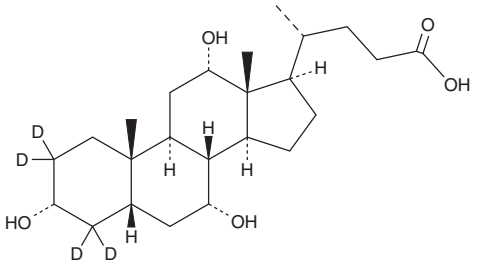
|---|---|
| **CAS Registry No.:** | 116380-66-6 |
| **Formal Name:** | (5β)-3α,7α,12α-trihydroxy-cholan-24-oic-2,2,4,4-$d_4$ acid |
| **Synonyms:** | CA-$d_4$, Cholalic Acid-$d_4$, Cholalin-$d_4$ |
| **MF:** | $C_{24}H_{36}D_4O_5$ |
| **FW:** | 412.6 |
| **Chemical Purity:** | ≥95% (Cholic Acid) |
| **Deuterium Incorporation:** | ≥99% deuterated forms ($d_1$-$d_4$); ≤1% $d_0$ |
| **Supplied as:** | A crystalline solid |
| **Storage:** | -20°C |
| **Stability:** | ≥4 years |




*Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.*

### Laboratory Procedures

Cholic acid-$d_4$ is intended for use as an internal standard for the quantification of cholic acid (Item No. 20250) by GC- or LC-MS. The accuracy of the sample weight in this vial is between 5% over and 2% under the amount shown on the vial. If better precision is required, the deuterated standard should be quantitated against a more precisely weighed unlabeled standard by constructing a standard curve of peak intensity ratios (deuterated *versus* unlabeled).

Cholic acid-$d_4$ is supplied as a crystalline solid. A stock solution may be made by dissolving the cholic acid-$d_4$ in the solvent of choice. Cholic acid-$d_4$ is soluble in organic solvents such as ethanol, DMSO, and dimethyl formamide (DMF), which should be purged with an inert gas. The solubility of cholic acid-$d_4$ in DMF is approximately 30 mg/ml and approximately 20 mg/ml in ethanol and DMSO.

### Description

Cholic acid is a primary bile acid.[1] It is formed from cholesterol *via* a multistep process catalyzed by the cytochrome P450 (CYP) isoforms CYP7A1, CYP8B1, and CYP27A1. Cholic acid is conjugated to glycine or taurine by bile acid-CoA:amino acid N-acyltransferase (BAAT) to produce glycocholic acid (GCA; Item No. 20276) and taurocholic acid (TCA; Item No. 16215), respectively, in the liver, and is transformed into the secondary bile acid deoxycholic acid (DCA; Item No. 20756) by intestinal microbiota.[1-3] It induces *C. difficile* colony formation in an agar dilution assay when used at a concentration of 0.1% w/v.[4] Dietary administration of cholic acid (0.4% w/w) increases serum cholesterol levels, biliary phospholipid secretion, and fecal DCA levels in rats.[5]

### References


1. Šarenac, T.M. and Mikov, M. Bile acid synthesis: From nature to the chemical modification and synthesis and their applications as drugs and nutrients. *Front. Pharmacol.* **9**, 939 (2018).
2. Hunt, M.C., Siponen, M.I., and Alexson, S.E.H. The emerging role of acyl-CoA thioesterases and acyltransferases in regulating peroxisomal lipid metabolism. *Biochim. Biophys. Acta* **1822(9)**, 1397-1410 (2012).
3. Staley, C., Weingarden, A.R., Khoruts, A., *et al.* Interaction of gut microbiota with bile acid metabolism and its influence on disease states. *Appl. Microbiol. Biotechnol.* **101(1)**, 47-64 (2017).
4. Sorg, J.A. and Sonenshein, A.L. Bile salts and glycine as cogerminants for *Clostridium difficile* spores. *J. Bacteriol.* **190(7)**, 2505-2012 (2008).
5. Uchida, K., Nomura, Y., and Takeuchi, N. Effects of cholic acid, chenodeoxycholic acid, and their related bile acids on cholesterol, phospholipid, and bile acid levels in serum, liver, bile, and feces of rats. *J. Biochem.* **87(1)**, 187-194 (1980).



**WARNING**
THIS PRODUCT IS FOR RESEARCH ONLY - NOT FOR HUMAN OR VETERINARY DIAGNOSTIC OR THERAPEUTIC USE.

**SAFETY DATA**
This material should be considered hazardous until further information becomes available. Do not ingest, inhale, get in eyes, on skin, or on clothing. Wash thoroughly after handling. Before use, the user must review the complete Safety Data Sheet, which has been sent *via* email to your institution.

**WARRANTY AND LIMITATION OF REMEDY**
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