

Product Information

sigma-aldrich.com

3050 Spruce Street, Saint Louis, MO 63103 USA
Tel: (800) 521-8956 (314) 771-5765 Fax: (800) 325-5052 (314) 771-5757
email: techservice@sial.com sigma-aldrich.com

Cholesterol Esterase from *Pseudomonas* sp.

Catalog Number **C9281**
Storage Temperature $-20\text{ }^{\circ}\text{C}$

CAS RN 9026-00-0
EC 3.1.1.13

Synonyms: Bile salt activated lipase, sterol esterase, carboxyl ester lipase, steryl-ester acylhydrolase

Product Description

Excess cholesterol is stored intracellularly as cholesterol esters. Cholesterol esterase (CE) is a reversible enzyme, with a molecular mass of $\sim 129\text{ kDa}$,¹ that can hydrolyze or synthesize fatty acid esters of cholesterol and other sterols. Hydrolysis of water-insoluble long chain fatty acid esters requires bile salt activation. Hydrolysis of water-soluble esters of short chain fatty acids and lysophospholipids does not require activation by bile salts.² Cholesterol esterase catalyzes the following reaction:



In the bovine adrenal cortex, this reaction is one of the rate limiting steps in steroidogenesis, involving the release of cholesterol from cytoplasmic cholesterol esters.³ This enzyme has been used to determine serum cholesterol.⁴

pH range: 7.0–9.0

Substrates: CE hydrolyzes cholesterol fatty acid esters in the following order (relative reaction rates):

Linoleate (18:2) > Palmitate (16:0) > Caprate (10:0) > Acetate (2:0).¹

Activators: cholic acid, glycocholic acid, BSA, Mg^{2+} , 0.3% (v/v) Triton™ X-100

Inhibitors: Ag^+ , Hg^{2+} , ionic detergents

This product is supplied as a lyophilized powder (tan to brown) containing $\sim 20\%$ protein (biuret), potassium phosphate, and Triton X-100 as an activator.

Specific activity: $\geq 10,000$ units/g protein

Unit definition: one unit will hydrolyze $1.0\text{ }\mu\text{mole}$ of cholesteryl oleate to cholesterol and oleic acid per minute at pH 7.0 at $37\text{ }^{\circ}\text{C}$ in the presence of taurocholate.

Cholesterol esterase is assayed spectrophotometrically in a 3.0 mL reaction mixture containing 287 mM potassium phosphate, pH 7.0, 0.25% (w/v) taurocholic acid, 0.25% (w/v) cholic acid, 4-6 units peroxidase, 1.4 mM cholesteryl oleate, 1.7% (v/v) polyoxyethylene 9-lauryl ether, 0.14% (w/v) NaCl, 0.083% (w/v) phenol, 0.03% (w/v) 4-aminoantipyrine, 1-1.5 units cholesterol oxidase, and 0.013-0.143 unit cholesterol esterase.

Precautions and Disclaimer

This product is for R&D use only, not for drug, household, or other uses. Please consult the Safety Data Sheet for information regarding hazards and safe handling practices.

Preparation Instructions

Cholesterol esterase is soluble in 0.4 M potassium phosphate, pH 7.0 (1 mg/mL).

Storage/Stability

Store the product at $-20\text{ }^{\circ}\text{C}$. When stored at $-20\text{ }^{\circ}\text{C}$, the enzyme retains activity for at least two years.

Reconstituted cholesterol esterase will retain activity at pH 6.0–6.5 for at least 25 hours at $25\text{ }^{\circ}\text{C}$.

References

1. Uwajima, T., and Terada, O., *Agric. Biol. Chem.*, **39(7)**, 1511-1512 (1975).
2. Hui, D.Y., and Howles, P.N., *J. Lipid Res.*, **43(12)**, 2017-2030 (2002).
3. Cook, K.G. *et al.*, *FEBS Lett.*, **132(1)**, 10-14 (1981).
4. Allain, C.C. *et al.*, *Clin. Chem.*, **20(4)**, 470-475 (1974).

Triton is a trademark of The Dow Chemical Company or an affiliated company of Dow.

ES-S,KAD,RBG,JWM,GCY,MAM 09/18-1